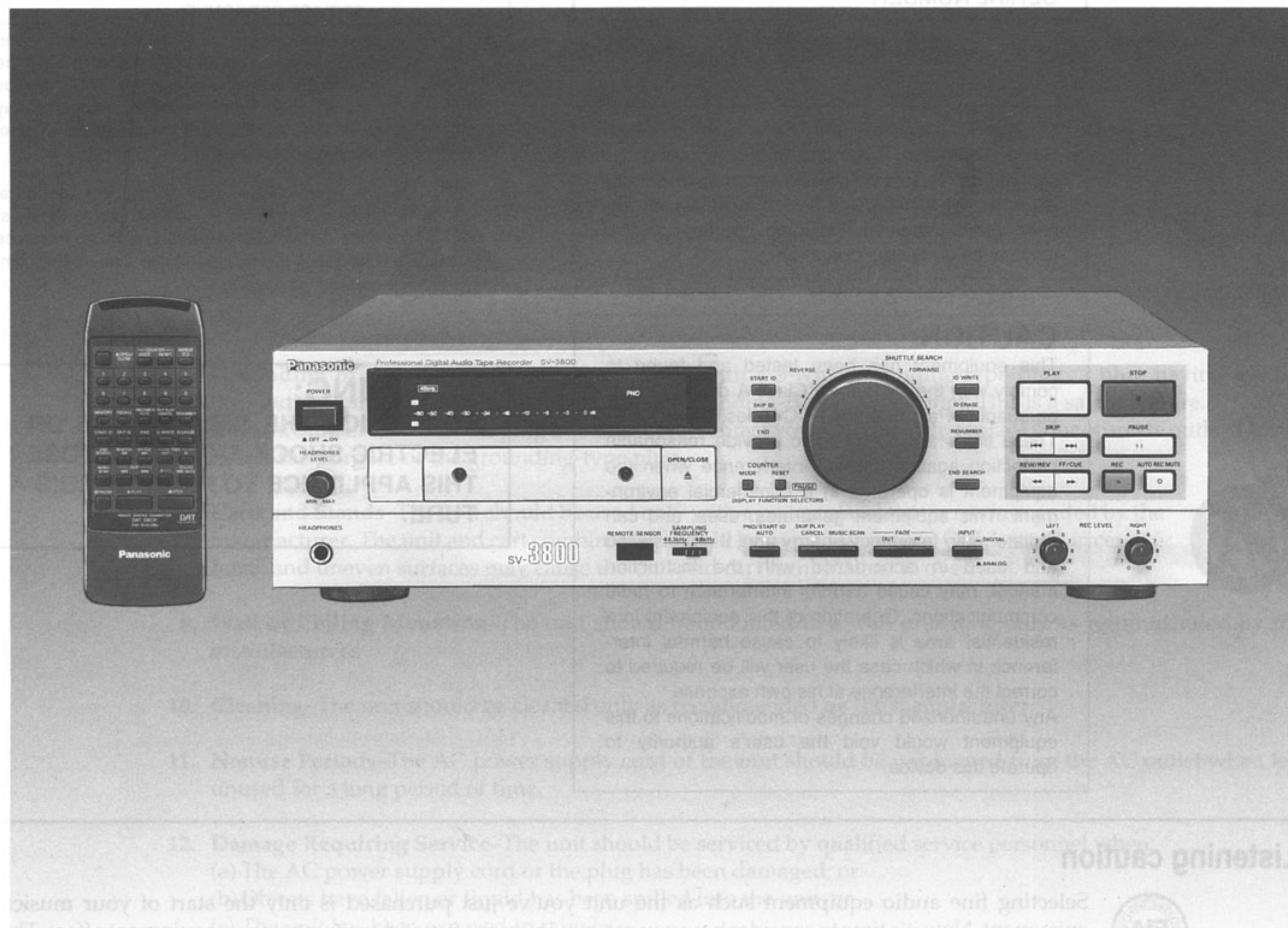


Panasonic®

Professional Digital Audio Tape Recorder SV-3800

Operating Instructions



Before connecting, operating or adjusting this product, please read these instructions completely.

Dear customer

Thank you for purchasing this product.
For optimum performance and safety, please read these operating instructions carefully.

The model number and serial number of this product can be found on either the back or the bottom of the unit.
Please note them in the space provided below and keep for future reference.

MODEL NUMBER SV-3800

SERIAL NUMBER _____

THE FOLLOWING PHRASES ARE APPLIED ONLY FOR U.S.A:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



CAUTION:

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



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

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



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.

WARNING:
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Listening caution



Selecting fine audio equipment such as the unit you've just purchased is only the start of your musical enjoyment. Now it's time to consider how you can maximize the fun and excitement your equipment offers. This manufacturer and the Electronic Industries Association's Consumer Electronics Group want you to get the most out of your equipment by playing it at a safe level. One that lets the sound come through loud and clear without annoying blaring or distortion—and, most importantly, without affecting your sensitive hearing.

We recommend you to avoid prolonged exposure to excessive noise.

Sound can be deceiving. Over time your hearing "comfort level" adapts to higher volumes of sound. So what sounds "normal" can actually be loud and harmful to your hearing.

Guard against this by setting your equipment at a safe level BEFORE your hearing adapts.

To establish a safe level:

- Start your volume control at a low setting.
- Slowly increase the sound until you can hear it comfortably and clearly, and without distortion.

Once you have established a comfortable sound level:

- Set the dial and leave it there.

Taking a minute to do this now will help to prevent hearing damage or loss in the future. After all, we want you listening for a lifetime.

Suggestions for Safety

Before using this unit, be sure to carefully read the applicable items of these operating instructions and the safety suggestions. 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. **Water and Moisture**—Do not use the unit near any source of water or in excessively moist environments.
2. **Object and Liquid Entry**—Care should be taken so that objects do not fall, and liquids are not spilled, into the enclosure through openings.
3. **Ventilation**—When installing the unit in a rack or any other location, be sure there is adequate ventilation. Improper ventilation will cause overheating, and can damage the unit.
4. **Heat**—The unit should be situated away from heat sources such as radiators, heat registers, stoves, or other equipment that produce heat.
5. **Power Sources**—The unit should be connected to a power supply only of the type described in the operating instructions, or as marked on the unit.
6. **Power Cord Protection**—AC power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
Never take hold of the plug or cord if your hand is wet. Always grasp the plug body when connecting or disconnecting it.
7. **Grounding of the plug**—This unit is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
8. **Carts and Stands**—The unit should be used only with a cart or stand that is recommended by the manufacturer. The unit and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the unit and cart combination to overturn.
9. **Wall or Ceiling Mounting**—The unit should be mounted to a wall or ceiling only as recommended by the manufacturer.
10. **Cleaning**—The unit should be cleaned only as recommended by the manufacturer.
11. **Nonuse Periods**—The AC power supply cord of the unit should be unplugged from the AC outlet when left unused for a long period of time.
12. **Damage Requiring Service**—The unit should be serviced by qualified service personnel when:
 - (a) The AC power supply cord or the plug has been damaged; or
 - (b) Objects have fallen or liquid has been spilled into the unit; or
 - (c) The unit has been exposed to rain; or
 - (d) The unit does not operate normally or exhibits a marked change in performance; or
 - (e) The unit has been dropped, or the enclosure damaged.
13. **Servicing**—The user should not attempt to service the unit beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.



Enhanced Sound Quality

- Same Type Sigma-Delta 1-bit A/D Converter as in the highly acclaimed SV-3700
- High-Resolution, Low-Distortion D/A Converter
- Multiple Digital Interfaces
 - AES/EBU
 - IEC958 for Consumer Use (Coaxial and Optical)
- Front Panel Section of All I/O Formats
- Single Program Play

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Supplied Accessories



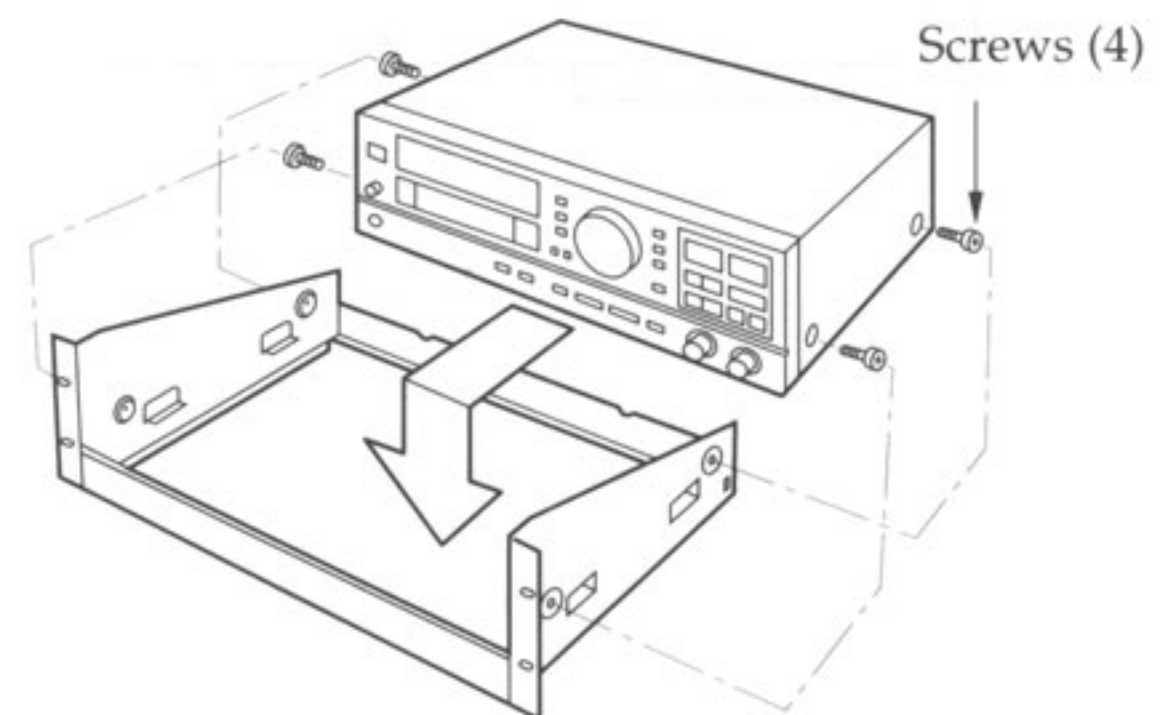
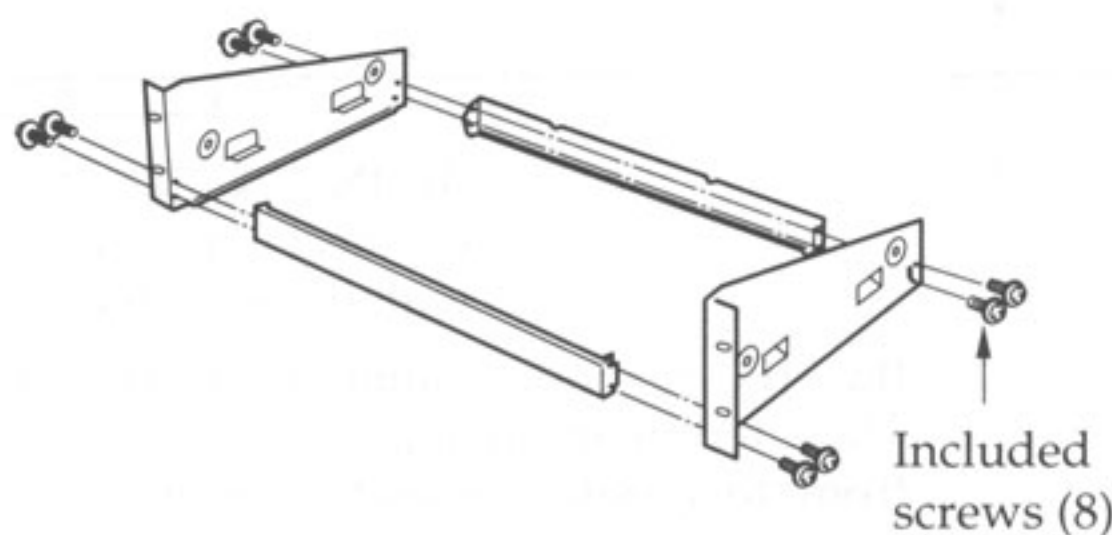
Please check and identify the supplied accessories.

- ☐ AC power supply cord (RJA0017-K) 1
- ☐ Remote control transmitter (RAK-SV012WH) 1
- ☐ Batteries (AAA, IEC R03, UM-4) 2
- ☐ Rack mount kit 1
 - (The rack ears: RYQ0059)
 - (The rack panels: RYQ0060)
- ☐ Screws (XYN3+F10FZ) 8

Installation

Installation of rack mount kit

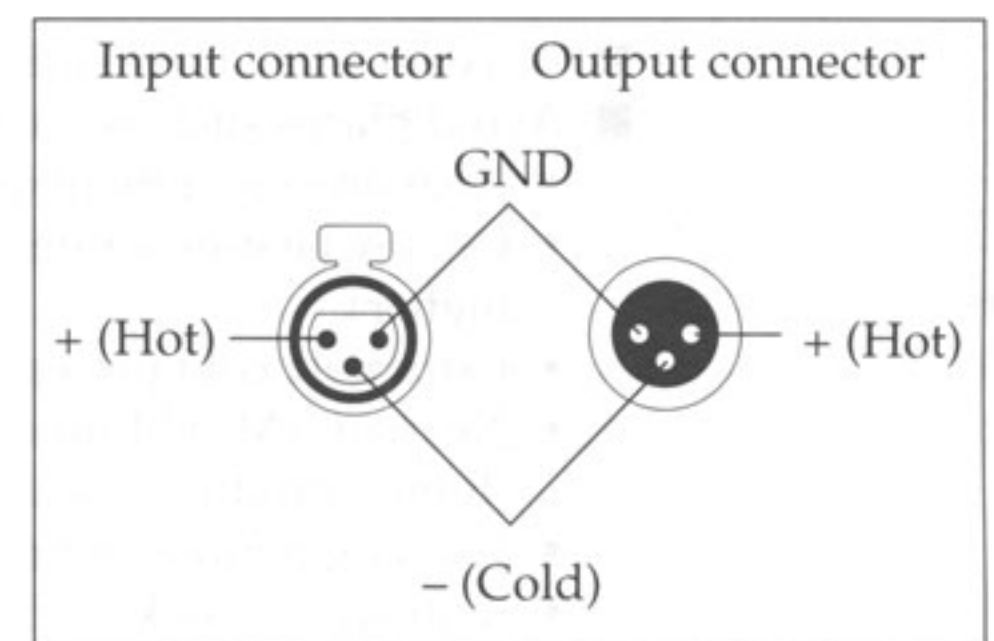
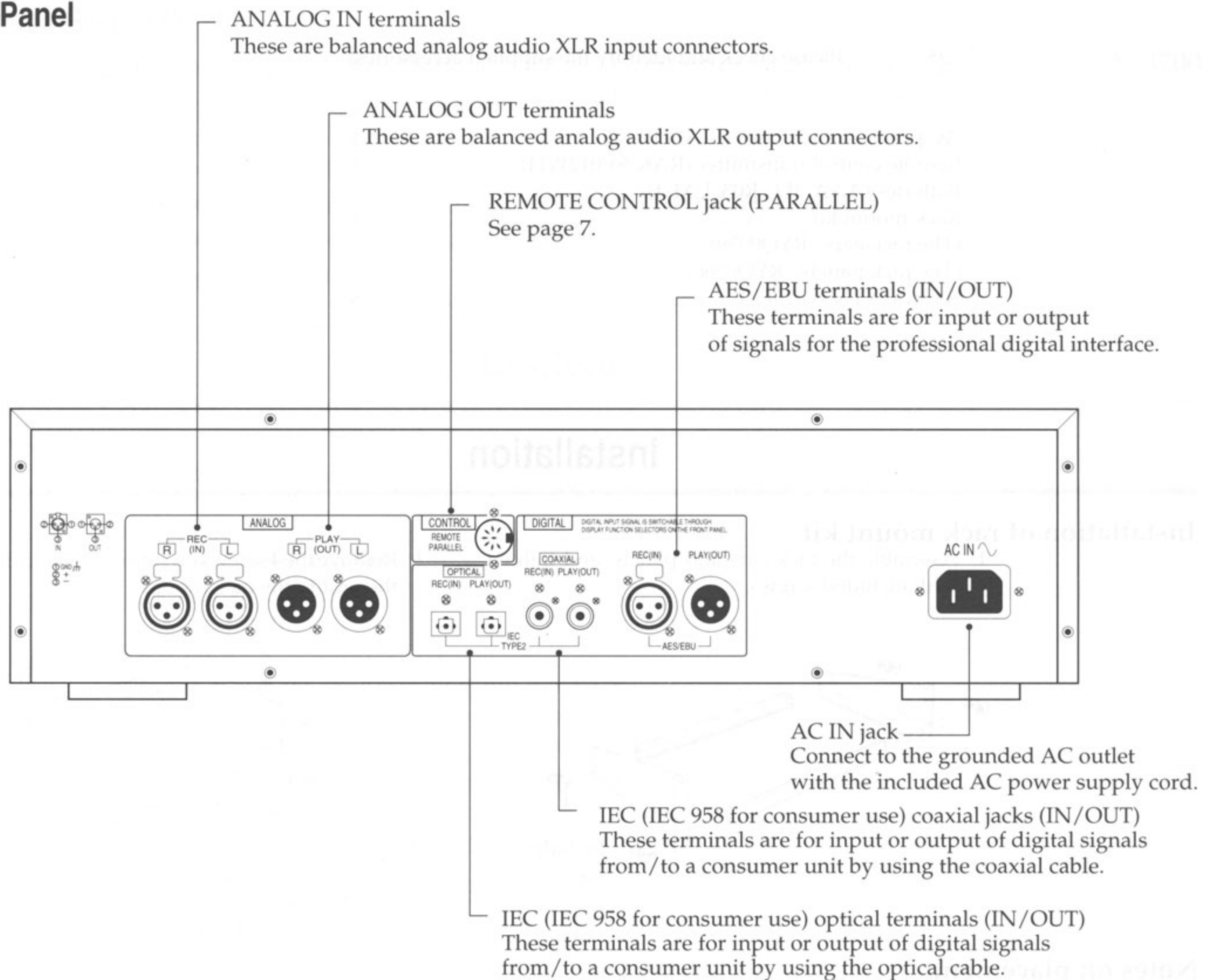
- 1 Assemble the rack ears and panels, and tighten with included screws.
- 2 Remove the 4 screws on side enclosure, and attach the unit to the rack mount.



Notes on placement

- Place on a flat, level surface so that the front-rear inclination does not exceed 15°.
- Avoid places such as the following:
 - Near any equipment or device that generates strong magnetism.
 - On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
 - Extremely cold places (5°C or below).
 - Near an AM/FM tuner or TV.
(It may produce noise in the broadcast, or disturb the TV picture.)
 - For long periods of time in direct sunlight.
 - In dusty or smoky locations.
 - In locations prone to vibrations.
 - In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.
 - Within reach of children.
- Do not place heavy objects, other than system components, on top of the unit.
- When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.
- To avoid problems due to vibration.
 - Do not place a book or similar object under this unit.
 - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

Rear Panel



When making digital IN/OUT connections

If the connections to studio equipment are set incorrectly, a loop may be set up where the output of the unit is connected to its recording input. This will not only set up an oscillation but may also damage the monitor speakers. Attention should therefore be paid to the following points:

- 1) When recording or playing back through the unit's DIGITAL IN/OUT terminals, be sure to connect these terminals to the DIGITAL PLAYBACK (IN)/DIGITAL REC OUT (OUT) terminals of other equipment.
- 2) If the monitor amplifier has no DIGITAL PLAYBACK or DIGITAL REC OUT terminals, this unit (DAT) can be used only for playback through the ordinary DIGITAL INPUT terminals on the amplifier.
- 3) If connections are made as in 2) and it is desired to record, do not on any account set the INPUT SELECTOR of the amplifier to "DIGITAL".

Concerning the Remote Control

This unit has two systems for remote control operation, using the infra-red remote sensor or the 8-pin parallel input terminals.

Remote Control Transmitter

Battery installation

Insert the batteries with using two AAA, IEC R03, UM-4 (1.5 V) or equivalent batteries in the correct polarities (+, -).

To remove the batteries, push down the (-) side.

- Notes:**
- Do not mix old and new batteries, or batteries of different types (manganese and alkaline, etc.).
 - Never subject batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
 - If the remote control is not to be used for a long period of time, remove the batteries and store them in a cool, dark place.
 - Do not attempt to recharge alkaline or manganese batteries.

Battery life:

The battery life is about one year. The batteries should be replaced if commands from the remote control transmitter do not operate the unit even when the transmitter is held close to the front panel.

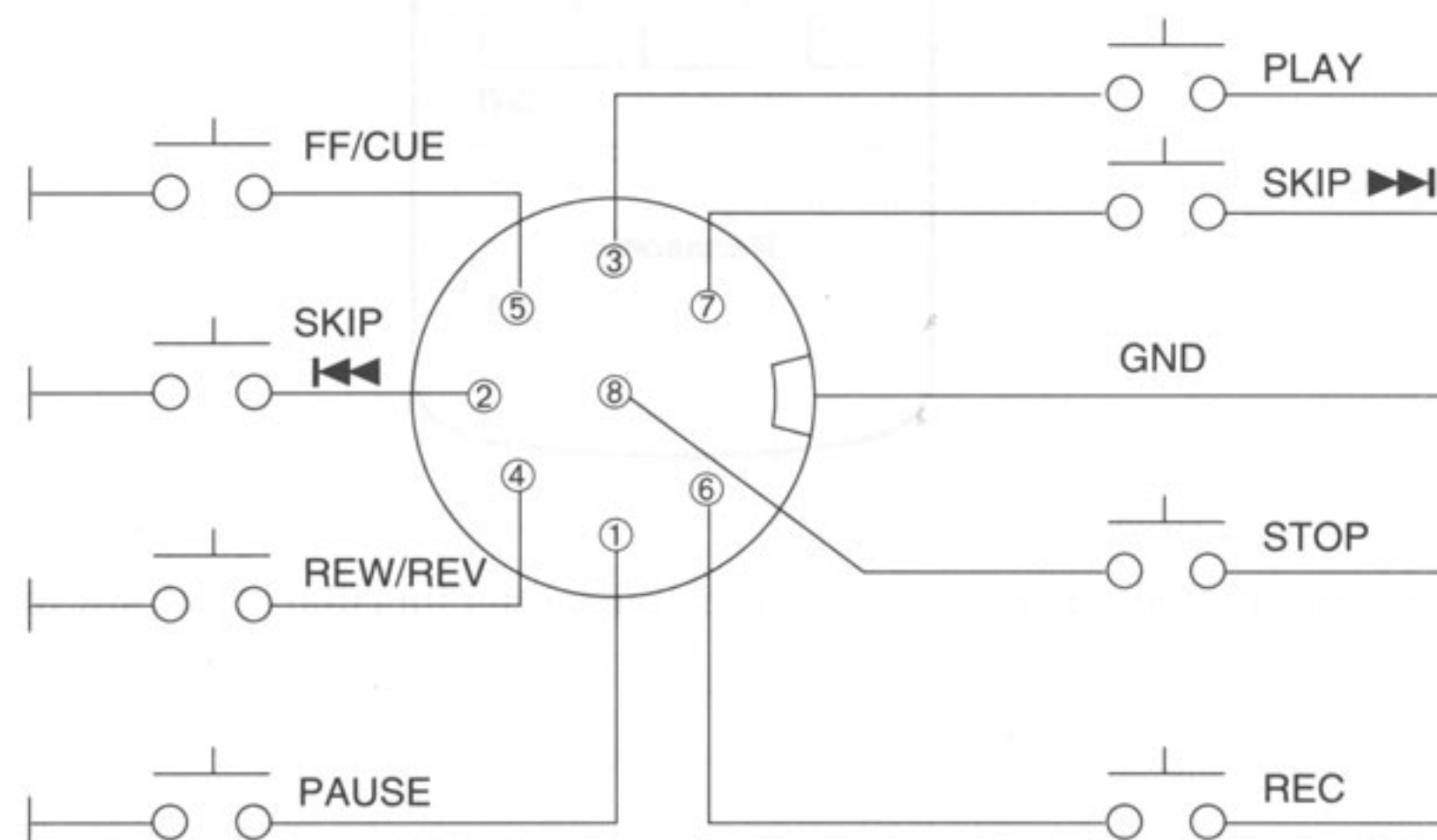
Correct method of use

- 1 Aim the remote control's transmission window toward the unit's sensor. Avoid any obstacles.
 - 2 Use the remote control within a 60-degree angle of the unit.
- The maximum distance is within 7 meters (23 feet) directly facing toward the unit.

- Notes:**
- Be sure the transmission window and the unit's sensor are free from dust. Excessive dust might affect its performance.
 - The operation may not be correct if direct sunlight or other strong light source strikes the receiving sensor of this unit. If there is a problem, place the unit away from the light source.
 - If this unit is installed in a rack with glass doors, the glass doors' thickness or color might make it necessary to use the remote control a shorter distance from the unit.

8-Pin Parallel Input Terminals

By connecting the following circuits, the SV-3800 can be operated by remote control using normal switches.



8-Pin Remote Specifications

8-pin remote key code:

Note: The time taken until the key code for operating multiple commands must be less than 1 ms, and each code input must be more than 60 ms.

Function	8-pin DIN jack key	Function	8-pin DIN jack key
	Code No. 87654321		Code No. 87654321
open	00000001	memory	01000000
music scan	00011000	recall	01000001
skip cancel	00110000	repeat	01100001
stop	01111111		
play	11111011	write_start-ID	01010000
write	01101001	write_skip-ID	01010001
		erase_start-ID	01110000
auto rec mute	00100000	erase_skip-ID	01110001
rec	11011111		
pause	11111110	rec+play	11011011
forward skip	10111111	direct rec_pause	00011001
reverse skip	11111101	direct rec_play	00111000
		unload	00111001
counter mode	00101000	mode+reset+pause	10110000
auto PNO	00110001		
fade in	00100001	skip cancel on	00000010
fade out	00001000	skip cancel off	00000011
ff	11101111	auto PNO on	00100010
rew	11110111	auto PNO off	00100011
renumber	00010001		
counter reset	00001001		
end-ID	01101000		
skip-ID	01001001		
start-ID	01001000		
end search	01100000		
erase	00010000		
0 (key pad)	11000001		
1 (key pad)	10000000		
2 (key pad)	10000001		
3 (key pad)	10100000		
4 (key pad)	10100001		
5 (key pad)	10001000		
6 (key pad)	10001001		
7 (key pad)	10101000		
8 (key pad)	10101001		
9 (key pad)	11000000		

0: The connection is shorted.

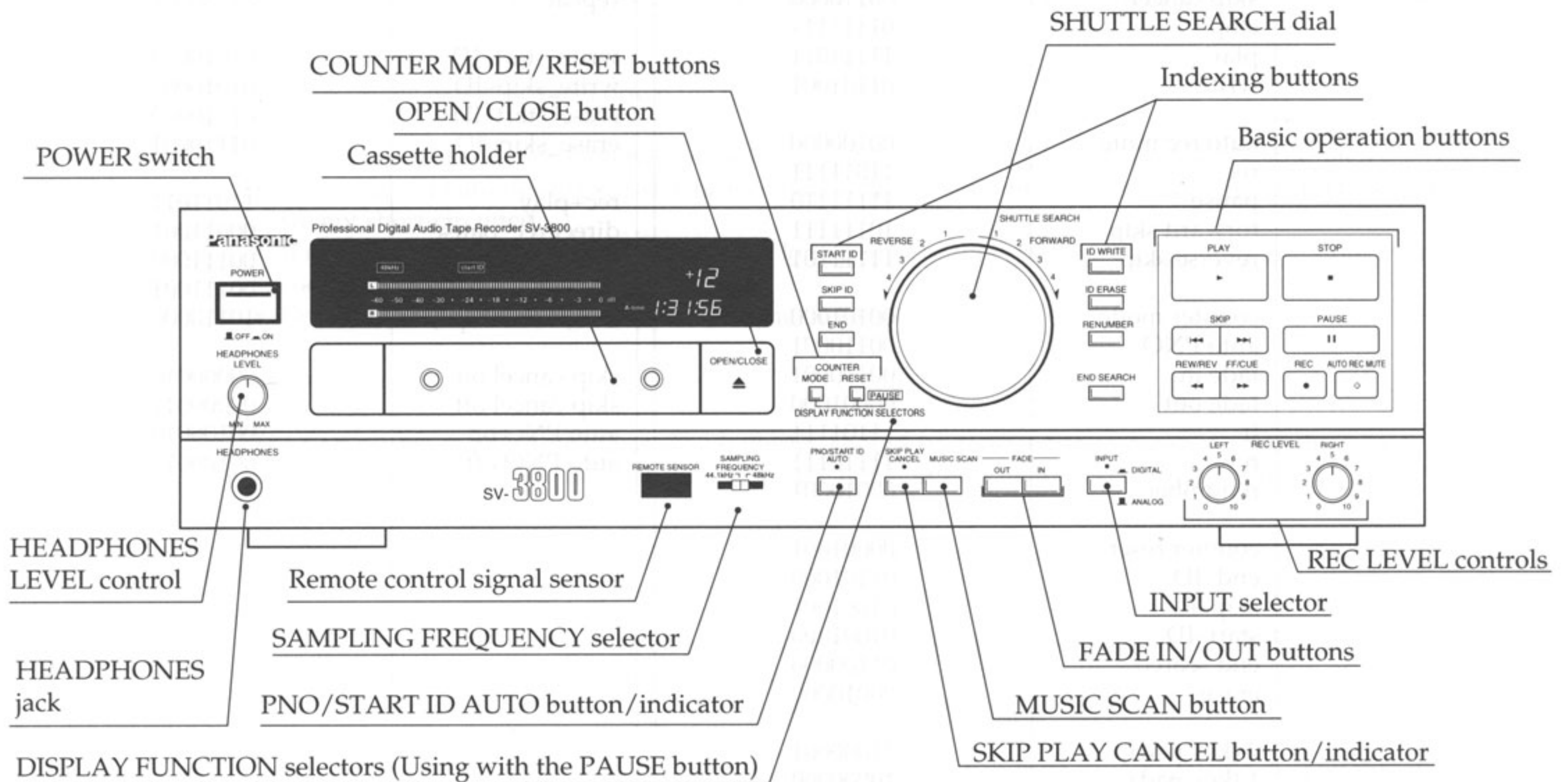
1: The connection is open.

Location of Controls

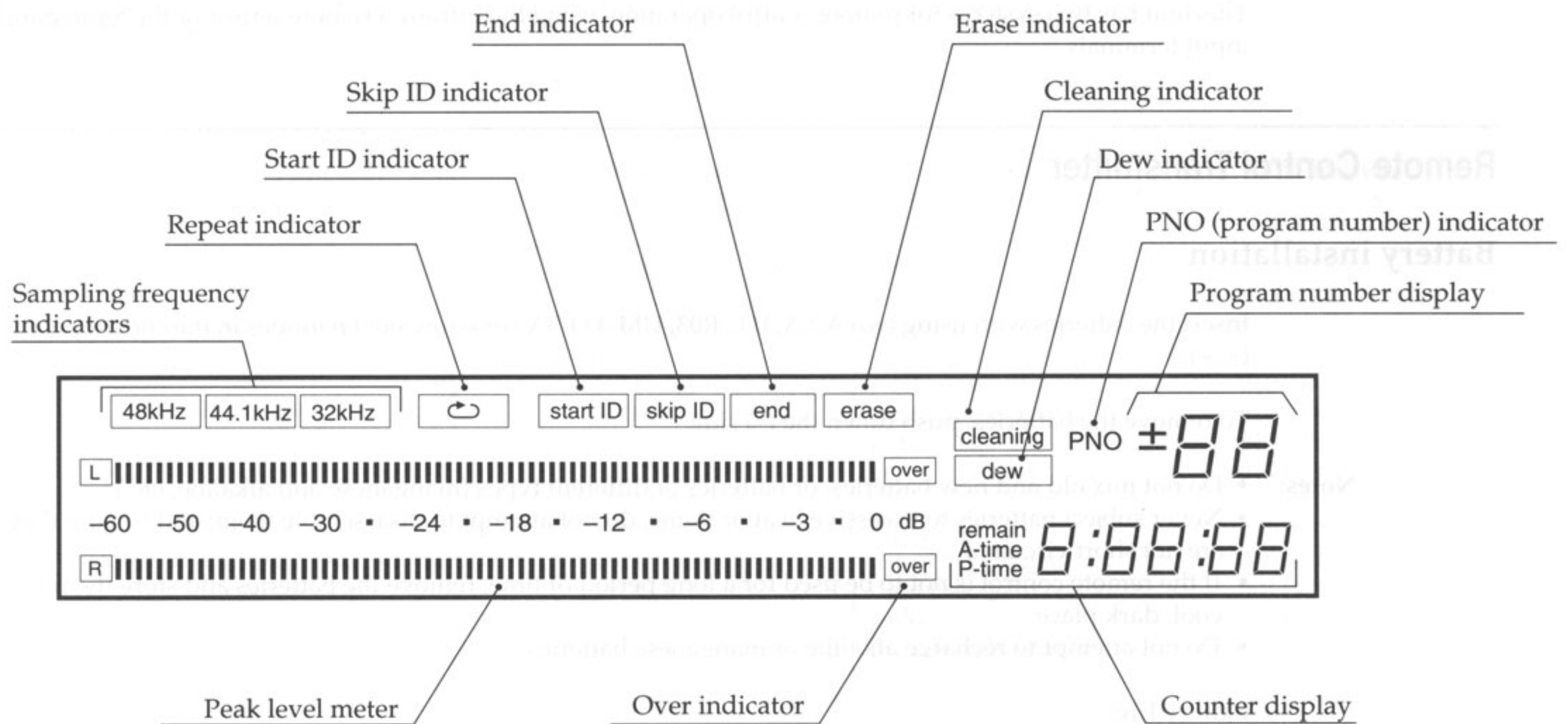


It's a good idea to keep these Operating Instructions open at this page when using the unit.

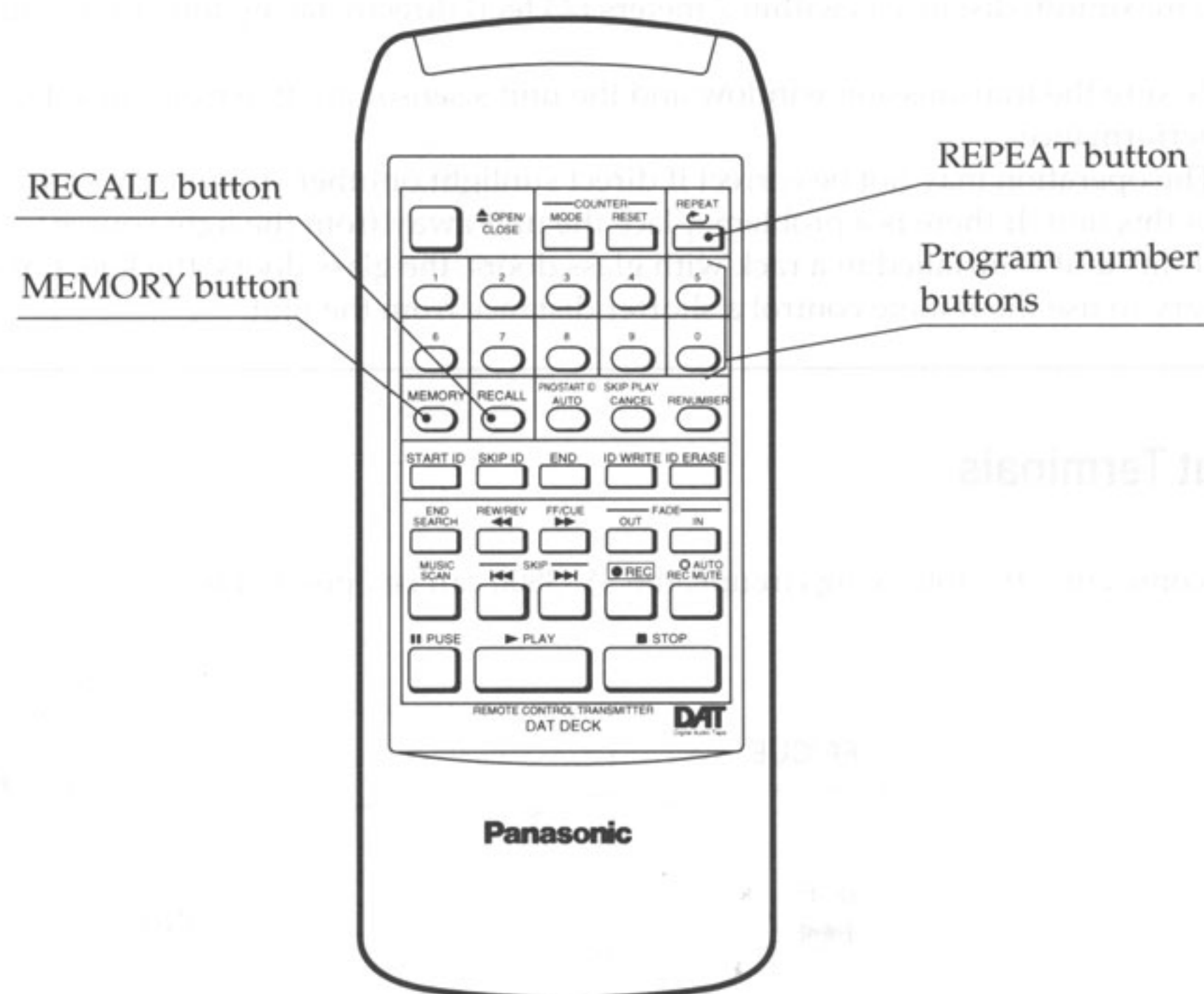
Front Panel



Display Panel



Remote Control Transmitter

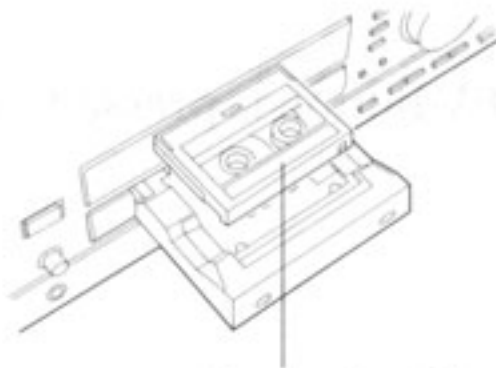


Unexplained buttons on the remote control transmitter function identically to their corresponding parts on the SV-3800.

Basic Operations for Recording and Playback

Inserting and removing cassette tapes

- 1 Press the POWER switch to switch on power.
- 2 Press the OPEN/CLOSE button.
The cassette holder will open.
- 3 Insert a cassette tape.



Insert a cassette correctly so that the tape reels are visible.

- 4 Press the OPEN/CLOSE button.
The cassette tape will be loaded automatically into the transport mechanism.

Note: During recording, the OPEN/CLOSE button does not operate. When removing tape, first press STOP button and then press this button.
While the cassette holder is being opened or closed, the counter display will flash. When the display is flashing, the control buttons will not operate.

When the power is switched on with a cassette tape in the unit, counter display shows:



When the cassette tape has not been inserted, no display will be shown.

Basic operations

Object to operate	Button to press	Indicator
To begin playback	Press the PLAY button.	The play indicator illuminates.
To begin recording	Press the REC button and then press the PLAY button.	The rec and play indicators illuminate.
To interrupt recording or playback temporarily	Press the PAUSE button. (Press the PLAY button to resume recording or playback.)	The pause indicator illuminates.
To stop recording or playback	Press the STOP button.	

Unloading function

After 12 hours of the unit in stop, pause or record standby modes, the cassette tape will be released automatically from the head drum.

CAUTION! If the unit is not going to be used for extended periods, rewind the cassette tape back to the beginning, remove it and turn off the power.

Search Functions

Fast-forward play, rewind play (During playback)

When the FF/CUE button or REW/REV button is kept depressed: Advances or reverses the tape during playback at about 3 times normal speed, with reduced level audio output (does not operate during recording).

Note: When operating the "Cue" or "Review", the playback will contain some chatter noise causing by the head crossing over the recorded track on the helical slant. This is not a malfunction. Reduce the volume of the monitor amplifier to optimum level. (Take special care during playback with digital output signals.)

Fast-forward, rewind (During stop mode)

When the FF/CUE button or REW/REV button is pressed , advances/reverses tape at about 250 times normal speed.

Shuttle search

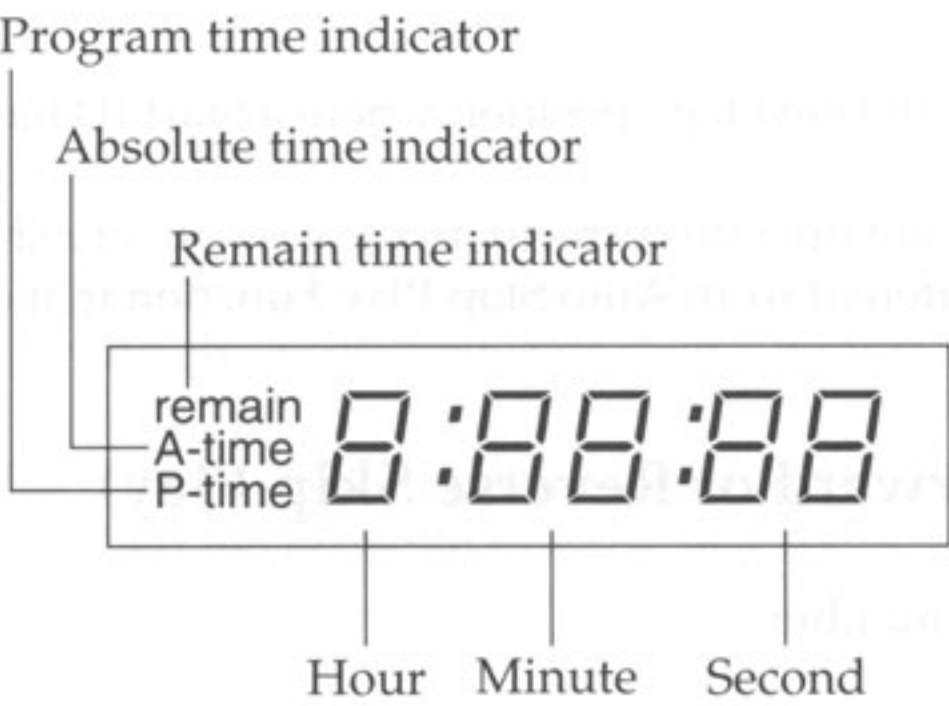
This function allows you to search rapidly forward or backward on the tape for specific sections with a high degree of accuracy, while listening to the material recorded on the tape.

Search play speed (four steps)

Scale	Operation mode	
	Play	Pause
1	× 3	× 1/2
2	× 5	× 1
3	× 9	× 2
4	× 15	× 3

Counter Display

Counter display mode

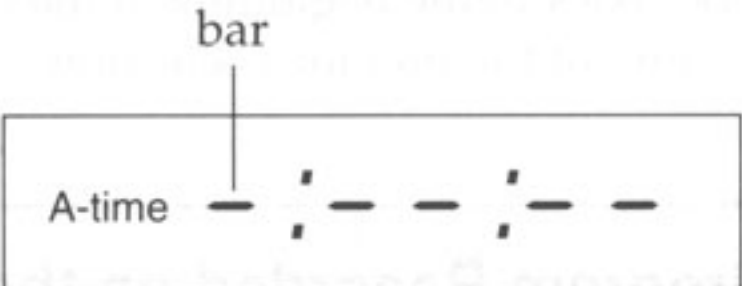


Counter display mode changes in the order as shown below each time the COUNTER MODE button is pressed.

Counter mode	Description
1 Absolute time (A-time) <div>A-time 1:55:58</div>	The time elapsed from the start of the tape until the current recording or playback position on the tape is indicated in hours/minutes/seconds. During recording this time is automatically recorded to enable the tape position to be checked or a particular position on the tape to be searched accurately. The time is not displayed if it was not written during recording.
2 Program time (P-time) <div>P-time 0:15:30</div>	The amount of play time that has elapsed from the start of a program is indicated for each program. (The start of each program is designated by a start ID or PNO.) If the start of a program has been passed when a tape with the absolute time recorded on it is rewound, the remaining program time (Remain Program Time) is indicated.
3 Remain time (remain) <div>remain 0:05:- -</div>	The remaining time on the tape is indicated in hours/minutes. This makes it possible to check how much time is left on the tape during tape editing operations. Use this display only as a general guideline since there may be a slight discrepancy from the actual amount of tape remaining.
4 Tape counter <div>0725</div>	The count displayed corresponds to the rotational count of the tape reel. Select this position when the absolute time has not been written. Use the COUNTER RESET button to reset the tape counter to "0000".
5 Peak margin <div>P 02 - 7</div>	The peak level margin is indicated. "PEE-E" appears when the peak level is exceeded. "P02-7" indicates that the margin is 2.7 dB, and the digit occupying the first decimal place is indicated only when the margin is less than 3 dB. If the reset key is pressed in this display mode, the existing margin is cleared.

When the sub codes are not recorded on the tape (when a brand-new tape is used)

The bar moves from left to right. (The bar moves from right to left during the review or rewind modes.)



The bar also appears during the following cases:

- The program time is not identified.
- The remain time is being calculated.

When the tape comes to the end

"E" appears on the program number display.



Playback Functions provided by the Recorder

Skipping Programs (Skip Play)

This function cues to the next tape position where a Start ID has been recorded.

- Notes:**
- This function may not operate correctly in the case of very short audio segments (about 30 sec. or less).
 - This function is different from Auto Skip Play Function in indexing. (Refer to pages 23 and 26.)

Skip forward or backward (Forward or Reverse Skip Play)

(1) Setting the skip number

In the playback, standby or stop mode, press the forward or reverse SKIP button.

When the button is pressed, the skip number is incremented or decremented by 1; when it is kept depressed more than 1 sec., the number is continuously incremented or decremented (up to ± 99).

Press the forward or reverse SKIP button so that the number of programs you want to skip are displayed in the program number display panel. The number of times the button is pressed is indicated with a plus "+" or a minus "-" sign.

- Note:** During reverse skip, the segment now being played is counted as one skip.

(2) Starting skip search

Skip search is started after the skip number setting is entered.

Action taken	Operation
1) Do not press the SKIP button within 2 seconds after the skip number was set.	Search is commenced automatically. (In the playback mode, playback is started after the search, and in the other mode, the pause mode is established after the search.)
2) Press the PLAY or PAUSE button within 2 seconds after the skip number was set.	Playback search or pause search is commenced.

The PLAY or PAUSE button may be pressed even during search operation to select either mode upon completion of the search.

- Note:** During skip search, changing the skip number is not possible.

Skip during program play

Each time the SKIP button is pressed during program play, the program sequence changes and is displayed. After the program sequence has been memorized and the forward SKIP button is pressed while a certain selection is being played, the tape advances to the next selection.

After the program sequence has been memorized and the reverse SKIP button is pressed while a certain selection is being played, the tape goes back to the beginning of the current selection. If the button is pressed again, the tape goes back to the beginning of the previous selection.

Identifying the Contents of Each Program Recorded on the Tape (Music Scan Play)

Press MUSIC SCAN button.

The beginning of each audio segment from which MUSIC SCAN button is pressed will be played for approx. 15 sec., and the play indicator will flash.

If a desired audio segment is found during scanning, press the PLAY button to continue playback. When the unit is changed to the playback mode, the play indicator will illuminate.

To interrupt the scan, press the STOP button.

- Note:** Music scan does not function during program play.

Playback Functions provided by the Remote Control Transmitter

Playback of any Desired Segment (Access Play)

By specifying a segment and pressing the PLAY button, playback will begin from that location.

- Notes:**
- This operation cannot be performed with tapes which have no program numbers recorded on them.
 - It may not be possible to find short segments less than 1 minute long.

- 1 Select the desired program number with the program number button on the remote control transmitter. The program number will appear on the program number display.
- 2 Press the PLAY button. While the program number is being searched, the play indicator will flash. After the specified program number has searched, the play indicator illuminates and play begins.

Example: To begin playback from 10th program
Press "1", "0", and PLAY buttons in that order. The unit searches for the specified program, playback begins and the program is displayed on the program number display.

To cue the machine to a desired segment:

If a desired audio segment is specified and the PAUSE button is pressed, the specified program number is searched and the unit enters the pause mode. While the tape is searching for each segment, the pause indicator will flash. To begin playback, press the PLAY button.

To change a specified program (Only effective in stop mode):

Press the "0" button twice, then press the correct button for the desired selection.

Playback of Segments in any Desired Order (Program Play)

Note: This function cannot be used with tapes on which program numbers have not been recorded.

- 1 Select the desired segments with the program number buttons on the remote control transmitter in the stop mode. The segment selected will appear in the program number display panel.
- 2 Press the MEMORY button on the remote control transmitter to memorize specified segment.
- 3 Repeat steps 1 and 2 to memorize segments in desired order.
Up to 32 steps can be memorized in this way.
- 4 Press the PLAY button. Playback begins from the first selection. While the tape is searching for the beginning of selections, the play indicator flashes. After memorizing, if the PAUSE button is then pressed, the first selection is searched and the unit enters the pause mode.

Example: To play segments 3, 5 and 8 in that order
Press "3", "MEMORY" → "5", "MEMORY" → "8", "MEMORY", and PLAY button.
When the last program has been played, the unit enters the stop mode.

To change program selections:

If it is desired to change some selections and the MEMORY button has not yet been pressed, press the "0" button twice to cancel the incorrect selections. Then enter the correct selections. When the MEMORY button has already been pressed, pressing the STOP button cancels all selections and then enter the new selections again.

To confirm memorized program selections:

If for example, segments 3, 5 and 8 have been memorized in that order, and the RECALL button is pressed while segment 3 is playing, the display will show first memorized program and sequence (PNO 03, P-01), next memorized program and sequence (PNO 05, P-02), and last memorized program and sequence (PNO 08, P-03) in that order.

After last memorized program is displayed, display returns to original display.

To interrupt program play:

Press the STOP button.

To recall the programmed selections:

When the RECALL button is pressed once the STOP button has been pressed, the programming is restored. After recalling the programmed selections by pressing the RECALL button, the additional programs can be entered.

If the program number button is pressed instead of the RECALL button once the STOP button has been pressed, the input program is cleared and programming commences anew from program 1.

Reference: The program is considered to be at its end in the following circumstances:

- When the Start ID of the next program has been detected
- When the Skip ID has been detected while the auto skip play mode is on
- When a blank section (in which an audio level of less than selected detection level continues for more than 2 seconds) has been detected while the program playback blank skip mode is on (Refer to the system display functions and Automatic recording of program numbers.)
- When the tape has reached its end

Playing Tape Repeatedly (Repeat Play)

This function will repeatedly play either an entire tape, or programmed selections up to a maximum of 16 times.

- 1 Press the REPEAT button on the remote control transmitter. The repeat indicator illuminates.
- 2 Press the PLAY button. The play indicator illuminates, and play begins.

If all the segments are to be played repeatedly and an End mark is detected, the tape will return to the beginning and playback will begin again.

To cancel repeat play:

Press the REPEAT button. The repeat indicator turns off and the unit returns to the original playback mode.

If the STOP button is pressed, repeat play is cancelled and the tape stops.

Recording Absolute Time

- Be sure to observe the following precautions when recording onto a tape.
- ✓ Make sure the accidental erasure prevention tab on the DAT tape is set to the recording position so that recording can be performed (see page 39).
- ✓ Insert the cassette tape after the power is switched on.
When the power is switched on with a cassette tape in the unit, absolute time is not displayed on the counter display. To make sure that all recordings contain absolute time information, first operate the PLAY button, perform an end search (see page 21), or rewind tape to the beginning. Then, carry out normal recording operations.
- ✓ Even with new blank tapes, the tape may need to be rewound or End Search Performed. The Absolute Time display must show "0:00:00", which indicates that the machine recognizes the beginning of a tape. Absolute time will not be recorded if this display is not present.
- ✓ To advance the tape during recording, use the AUTO REC MUTE button without using the PLAY button or the FF/CUE button.
- ✓ When recording from a point mid-way along the tape, use the end search function to search for the end of the last recorded passage, and perform pick-up recording to ensure that there will no section without absolute time informations (see page 21).

IMPORTANT NOTE:

An absolute Time indication must be present on the display in order for the machine to record absolute time from that point on. If the machine does not recognize its present position, whether it is "0:00:00" or any other time, Absolute Time will not record. Audio recording, however, is unaffected.

Soundless recording and non-recording:

During soundless recording, the tape travels in a recording state and only the data necessary for recording digital signals are recorded. In this state, no audio signals are recorded.

As opposed to this, during non-recording, the tape travels in a state other than the recording state, and neither the audio signals nor the data necessary for recording are recorded.

(This is the same condition as that of a brand new tape.)

If such a non-recorded section exists in the middle of a recorded tape, important information such as absolute time will not be recorded.

Recording Program Numbers During Recording

There are two ways of recording program numbers as follows:

1) Automatic recording of program numbers

- 1 Press the PNO/START ID AUTO button if the pno/start ID auto indicator is not illuminated. The pno/start ID auto indicator illuminates.

Note: The "auto" mode setting, whether ON or OFF, applying when the power was last turned off is retained when the power is turned on.

- 2 Perform recording operation. When recording has started, program numbers are recorded automatically in order (segment 01, 02, 03...) as long as a program begins after there has been at least 2 seconds of no sound (below selected detection level). Program numbers are indicated on the display once they are recorded.

Setting the PNO/START ID AUTO detection level

The level at which a program is to be judged to have no sound can be set to any level in 10 dB increments between -20 dB and -60 dB.

When the PNO/START ID AUTO button is pressed with the "auto" mode ON, the mode will be turned off. When the same button is pressed with the "auto" mode OFF, the selected detection level is indicated momentarily (for approx. 1.2 sec.). If the button is pressed again while the detection level is indicated, the level is changed by one setting (-40dB → -50dB → -60dB → -20dB → -30dB → -40dB, etc.).

**IMPORTANT
NOTE:**

As with absolute time, the machine must recognize the current program number (PNO) in order to record the next sequential number. If there is no PNO showing on the display, then only Start ID's are recorded, without PNO's. This can occur, for example, if the tape is inserted into the machine in the middle of a segment, because Start ID's and PNO's are recorded only for the first 9 seconds of a program.

To set program numbers before recording:

- 1 In the recording standby mode, use the program number buttons on the remote control transmitter to input the number of the program to be recorded next.
The program number input flashes on the program number display.
- 2 Press the PLAY or FADE IN button.
Recording commences, and when the next Start ID is recorded, the programs are recorded starting with the program number which was set.
 - If the audio level exceeds selected detection level after it has fallen below selected detection level for more than two seconds, the Start ID is recorded automatically.
 - When making a recording from another DAT using the IEC Digital Input, Start ID's may be transmitted as well as the audio information. However, not all models transmit Start ID's. If in doubt, check with the manufacturer. Start ID's are recognized by the IEC Digital I/O on Panasonic and Technics models SV-DA10/3200/3700/3900/4100/3800. Additionally, the SV-4100/3800 AES/EBU ports transmit and receive Start ID's.
 - If the source tape has Start ID's which are less than 18 seconds apart, it will either not record onto the copy, or may be offset a few seconds late.
 - Some compact discs have a very short interval between tunes. Even in these cases, however, if your CD player has an auto space function, the space between tunes can be extended automatically so that program numbers are entered correctly during recording.

To cancel the automatic program numbering function:

Press the PNO/START ID AUTO button.

2) Manual recording of program numbers

- 1 Make sure the pno/start ID auto indicator goes out. Press the PNO/START ID AUTO button if the indicator is illuminated.
- 2 Press the PLAY button where you want to record a program number during recording. Each time this operation is performed, a program number (1, 2, 3 etc...) is recorded on the tape. These program numbers may be checked on the program number display.

Note: Make sure that the PNO display shows a program number. In this case, starting the tape from the record standby mode will increment that number and record it. If no number is indicated, then only a start ID is recorded without a program number (PNO).

- In automatic or manual recording of program numbers, a Start ID of 9 seconds duration is recorded each time a program number is recorded.
- If the tape is stopped temporarily with the PAUSE button, AUTO REC MUTE button, or the fade out, then recording is started again by pressing the PLAY button after the pno/start ID auto indicator has gone out, a program number is recorded at that point.

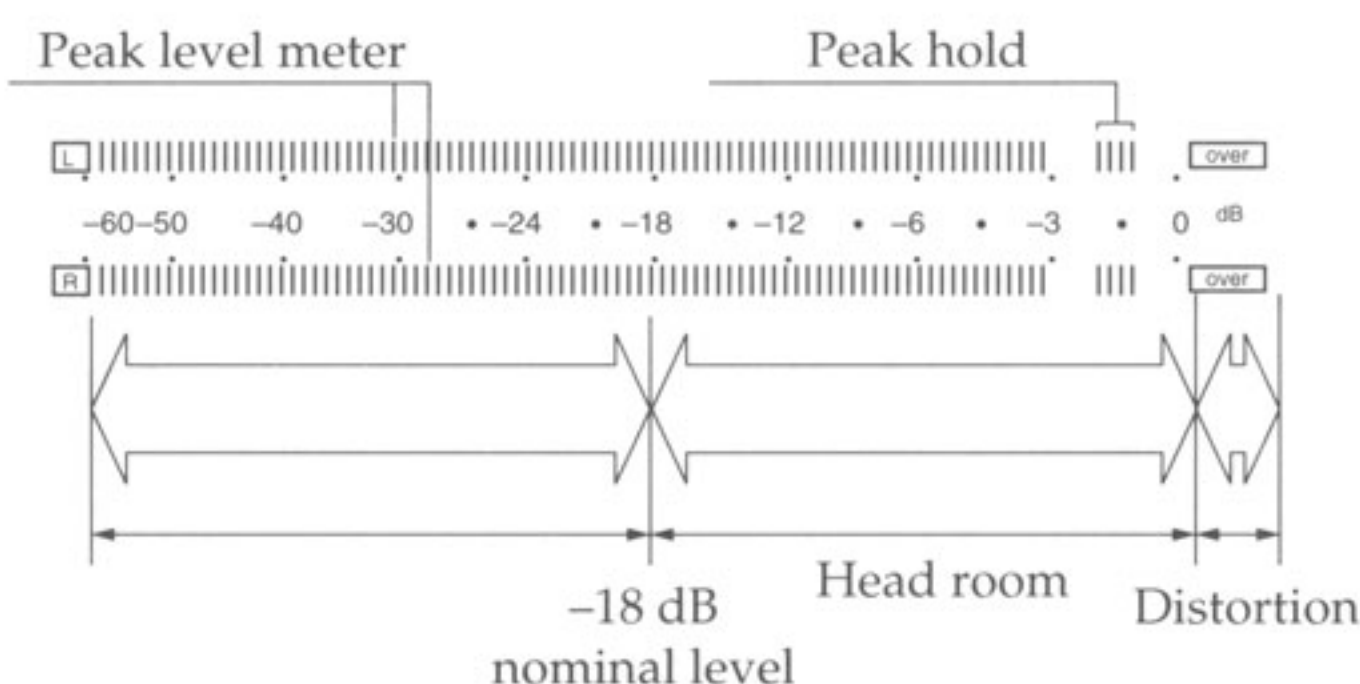
Making Analog Recordings

Recording from the beginning of the tape

- 1 Set the INPUT selector to the ANALOG position and select the desired sampling frequency (44.1 kHz or 48 kHz).
- 2 Press the REW/REV button. Be sure to rewind the tape even if a brand-new tape is used. This insures that the machine senses beginning of tape, and absolute time is initialized to "0:00:00". Failure to do this may result in absolute time and PNO's not to be recorded. (In the worst case, however, audio is recorded, and absolute time and PNO's can be added later without disturbance to the recording = retime function on page 26.)
- 3 Press the REC button. When a tape is used from its beginning, the rec and play indicators illuminate for approx. 4 seconds, and the pause indicator flashes. This is to erase any previous recording, and establish a leader which is required by the system. When this process is complete, the rec and pause indicators illuminate, and the play indicator goes out, indicating record standby mode. If the REC button is pressed when the tape is at a location other than the beginning, the unit immediately enters record standby mode, the tape stays at the present location until the PLAY button is pressed.
- 4 Input the audio source that is to be recorded, and adjust the recording level with the REC LEVEL controls. (see below.)
- 5 Press the PLAY button. The play indicator illuminates, and recording begins. The pause indicator goes out.

Adjusting the recording level

The -18 dB level on the meter corresponds to either +4 dB or -10 dB at the analog outputs, depending on the setting of DISPLAY FUNCTION SELECTORS. This is compatible with most professional and semi-pro analog equipment. However, in practical digital recording application, it is often desired to record at maximum level (0 dB) for optimum resolution. In this case, the recording level must be adjusted for the highest possible level where peak levels never trigger the "over" indicator.



Note: Since this unit uses digital-drive peak level meters, the recording signals will not be distorted provided that the level has been adjusted so that the over indicator does not light.

How to Make Silent Spaces on Tape/How to Erase

Inserting a silent space on the tape (Auto Rec Mute Function)

- 1 By inserting a silent space, a new recording can be clearly distinguished from the previous one. Press the REC button. After the unit enters the record standby mode, press the AUTO REC MUTE button. A silent space of approx. 4 seconds will then be recorded on the tape. During these 4 seconds, the pause indicator will flash and the play indicator will illuminate. After a recording has finished, be sure to insert a silent space of 4 seconds before stopping or pausing the tape. Consecutive recording and program play will then be performed more accurately.
- 2 To eliminate unwanted sections during a recording, press the AUTO REC MUTE button while the unit is in the recording mode. A silent space of approx. 4 seconds will be automatically inserted on the tape, and the unit will then enter the record standby mode. To begin recording again, press the PLAY button.

To make the silent space shorter or longer:

- **Making it shorter (less than 4 seconds)**
Press the AUTO REC MUTE button, then press the PAUSE button or PLAY button within 4 seconds.
When the PAUSE button is pressed, the unit enters the pause mode; when the PLAY button is pressed, recording begins.
- **Making it longer (greater than 4 seconds)**
Press and hold the AUTO REC MUTE button as long as necessary. When the button is released, the unit enters the record standby mode. To resume recording, press the PLAY button.

Erasing a recorded tape

When a tape is recorded again, any previous recording is erased automatically. To erase only the recording (without erasing absolute time), set the REC LEVEL controls to the minimum position, and record up to the end of the tape (check the peak level meter does not move).

When end search is performed on a tape that has been erased up to the end by the above method, the unit runs to the end of the tape. This is because end search looks for either blank, unused tape or an End mark. Although the previous recording is erased, absolute time is not, and this is viewed as a silent recording by the end search function.

Making Digital Recordings

- Before making digital recordings, check the following settings:
- ✓ type of digital audio interface (AES/EBU or IEC coaxial, optical)
 - ✓ value of ID6 SCMS status (only for AES/EBU I/O recordings)

For further details, see "System Display Mode Selection" on pages 28-31. After the required settings have been made, follow the procedures described below.

- 1 Make sure the INPUT selector is set to the DIGITAL position.
- 2 Press the REC button. The unit enters the record standby mode. The rec indicator and pause indicator illuminates.
- 3 Press the PLAY button. The pause indicator goes out. The play indicator illuminates, and recording begins.
- 4 Play the digital source that is to be recorded. The digital input can be monitored through the analog output, or via headphones.

- Notes:**
- When making digital recordings, rec level adjustment cannot be made.
 - When the INPUT indicator flashes, recording cannot be performed. In this case, the digital input terminals may not be correctly connected, or input terminal selection is not set correctly. (Refer to pages 6 and 28.) Connections, signals and input terminal selection should therefore be re-checked.

Only when signals are recorded in the automatic program number recording mode and a DAT recorder is used as the recording source are the Start IDs and Skip IDs on the player's tape recorded straight onto the recorder's tape. With any other source, the intervals between the programs are detected by the signal level for recording.

When recording is started with the program numbers displayed, it is possible to record these numbers as well. If the program numbers are not displayed, only the Start IDs will be recorded. However, the program numbers can be added later using the renumbering function. The desired program number can also be set by using the program number buttons on the remote control transmitter.

The automatic program number recording mode is established when material from an old type of DAT is edited with its digital signals.

Recording from the Middle of the Tape

- 1 Press the END SEARCH button.
The end of the last recording on the tape is searched at high speed, and the tape stops.



While the end search is being carried out "EE" flashes on the program number display.

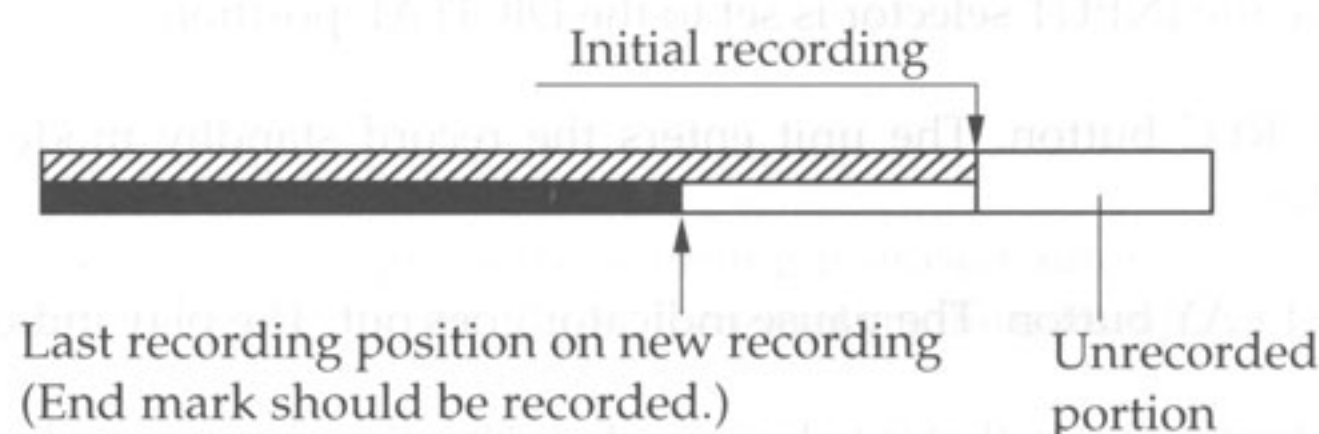
- 2 Press the REC button. The rec and pause indicators illuminate, and absolute time will then be recorded once the PLAY button is pressed.

- Notes:**
- The end search function may not operate correctly for tapes that contain a recording lasting only for 1 minute or so.
 - In the end search mode the tape may stop at a position very slightly before from the last recording position.

Concerning end search

When using a tape that has been previously recorded on, it may be advisable to record an End mark at the end of the new recording. End Search will cue up to the End mark if it does not first encounter a blank, unused portion of tape. If no End mark is present, then it searches for unused tape.

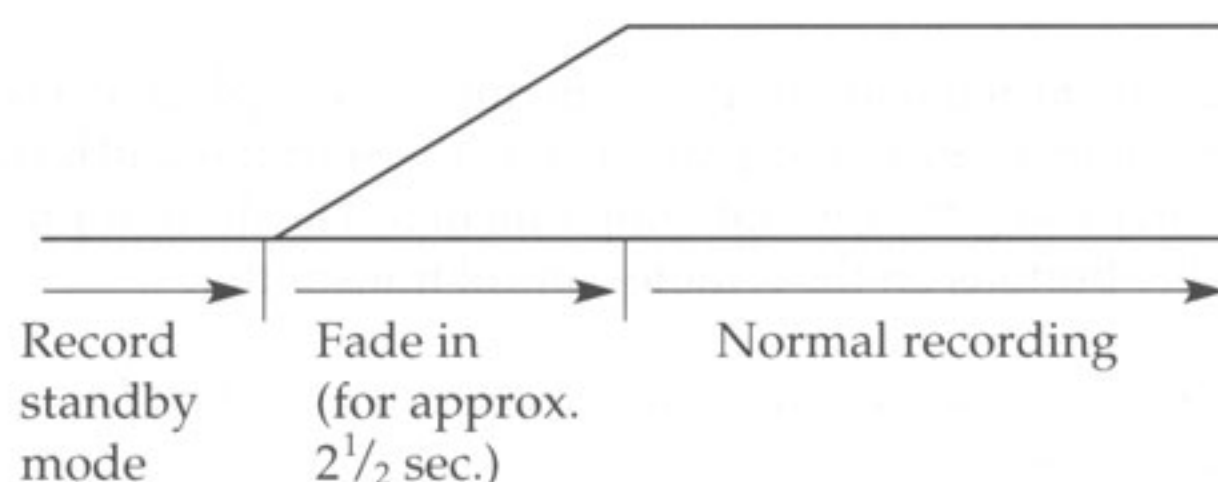
Note: A tape is recorded on even if there is no audio input. Anytime the unit is run in Recording mode, an "RF Envelope" will be present on the tape. An End mark must be present in order for End Search to work on tapes which have the RF Envelope recorded throughout.



Making Fade In/Fade Out Recordings

Fade in

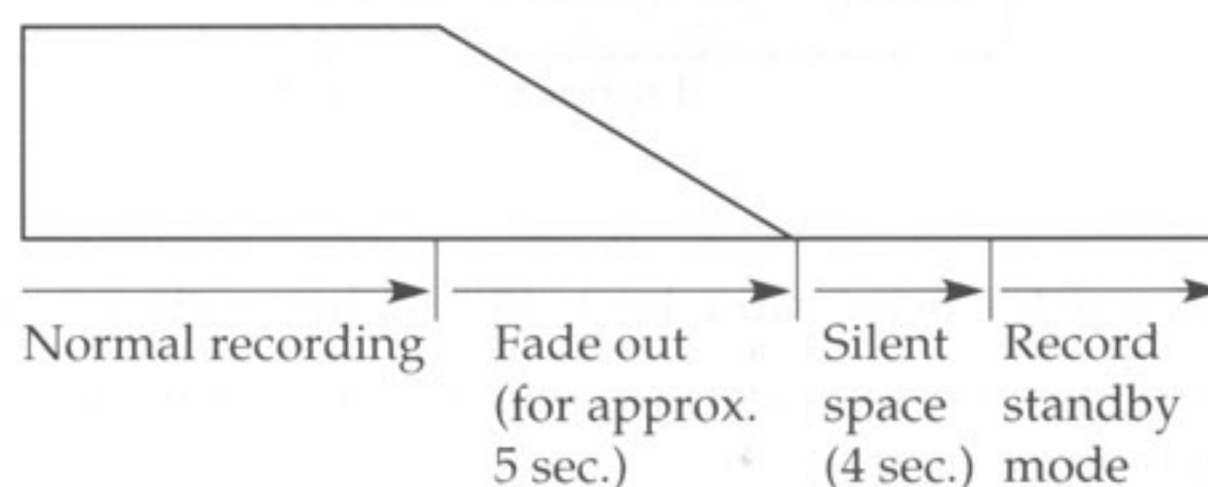
This starts recording and gradually increases the level of the sound.



- 1 Follow the procedures described in "Before Recording" and "Recording", according to the source of the sound.
- 2 Press the REC button to enter the record standby mode.
- 3 Press the FADE IN button. Full-level recording begins after an approx. 2 1/2 seconds fade in period.

Fade out

This gradually reduces the level of the sound, and enters the pause mode.



Press the FADE OUT button during recording.

After approx. 5 seconds of fade out, approx. 4 seconds silent space is recorded, and then the unit enters the record standby mode.

Description of Sub Codes

2) Manual recording DAT recordings consist not only of audio information, but also sub code. The sub code portion of the recording includes absolute time, PNO's, Start ID's, Skip ID's, etc. These sub codes enable the beginning of a program to be searched during playback or to edit a tape after it has been recorded.

Sub codes are used not only for automatically writing information during recording, but can also be changed later without disturbing the audio.

Subcodes available with this unit

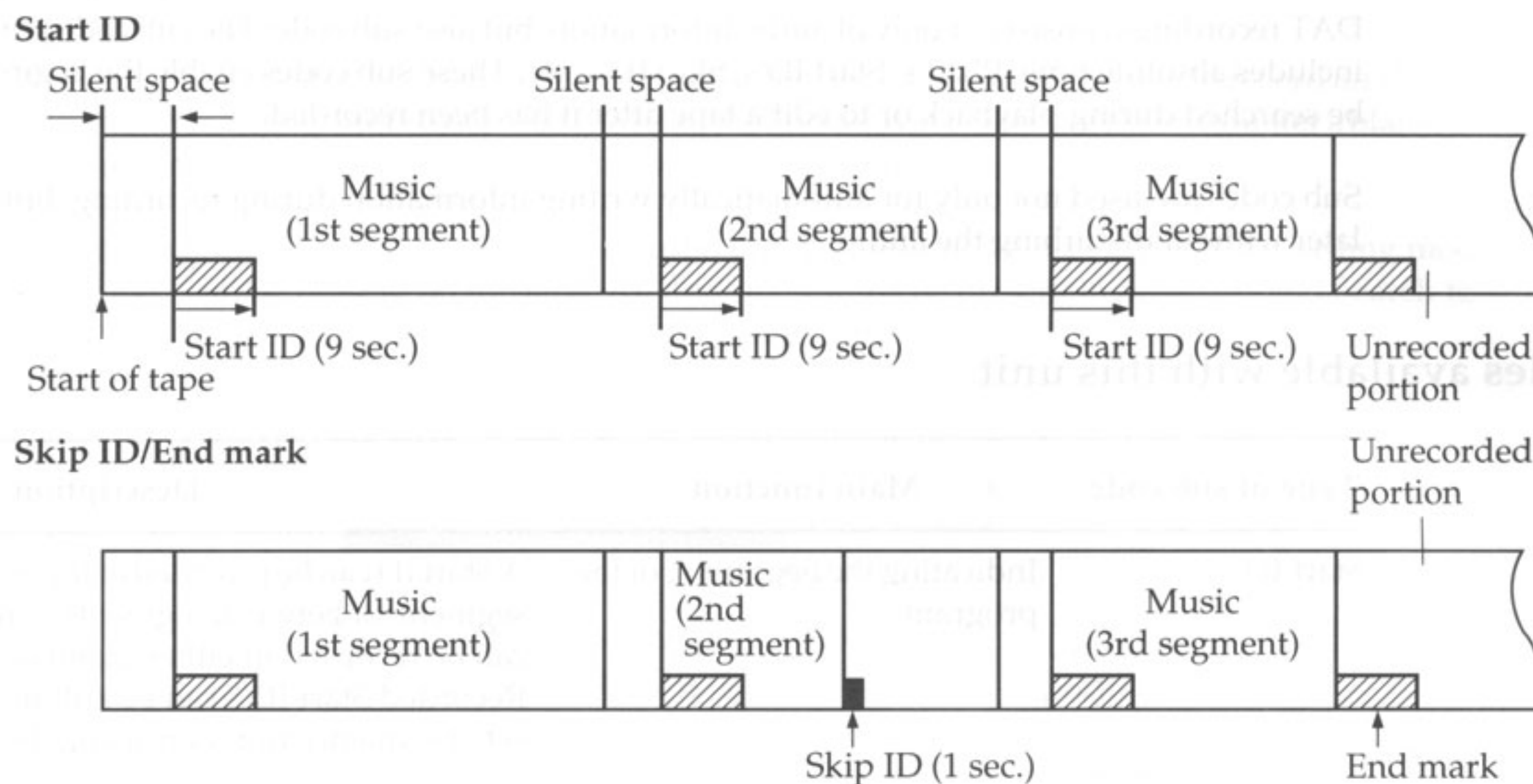
Type of sub code	Main function	Description
Start ID	Indicating the beginning of the program.	A Start ID can be recorded at the beginning of any audio segment, or between segments as required. The Start ID can be recorded in either manual or automatic mode. Recorded Start ID's can be automatically re-assigned a set of sequence numbers using the Renumber function.
Skip ID	Causing the unit to go into fast-forward mode until the next Start ID is reached, in order to skip unwanted material.	Skip ID's can be recorded to provide automatically skip-over function, to jump parts of the tape you do not wish to hear (Auto Skip Play Function). Skip ID can be manually recorded or erased at the required position.
End mark	Indicating the end of the last recording on the tape.	End mark can be recorded or erased at the end of the recording, and searched by using end search function.
Program number (PNO)	The number of the program recorded on tape.	Program numbers are recorded in sequential order. After erasing or re-recording Start ID's, program numbers can be rearranged in Start ID order.

Note: Recording of a sub code other than an End mark will have no effect on the audio signals recorded on the tape.

Concerning Indexing

During recording, Start ID, program number, absolute time and program time can be recorded automatically by setting the PNO/START ID AUTO button. Program numbers can be re-sequenced by indexing. To index the tape in stop or pause mode, advance the tape to the desired position by means of the SHUTTLE SEARCH dial, FF/CUE button or REW/REV button, and then stop it with the PAUSE or STOP button.

- Notes:**
- Reset the accidental erasure prevention tabs, so that the tape can be recorded.
 - If the OPEN/CLOSE button is pressed and the cassette tape is removed during indexing, the index mode will be cancelled.
 - Start ID's may be written without PNO's, but a PNO cannot be written without a Start ID. If a Start ID only is on the tape, it can be accessed with the Skip Forward and Skip Backward functions. Random access by program number in this case is not possible.



Each of the following indicators will light during playback of a tape on which Start IDs, Skip IDs and End marks have been recorded.

- When the tape reaches the point where a Start ID is recorded, the start ID indicator will light for about 9 seconds.
- When the tape reaches the point where a Skip ID is recorded, the skip ID indicator will light for about 1 second.
- When the tape comes to the position where an End mark is recorded, the end indicator will light.

To Record Start ID's During Playback

1) Automatic recording

In this method, a Start ID is automatically recorded on the tape wherever a *level transition is detected. A Start ID is recorded at the beginning of each segment on tapes where program numbers have not been recorded. In the case of tapes that already contain Start ID's, the previous recording is erased and a Start ID is recorded where the audio begins. As long as these Start ID's are recorded, you will be able to make full use of access play and program play functions.

* Level transition: means the audio signal must exceed the selected detection level threshold after at least 2 seconds below selected detection level. This is referenced to 0 dB, which is maximum recording level.

- 1 Enter the auto mode. The pno/start ID auto indicator illuminates.
- 2 Press the START ID button. The start ID indicator flashes.
- 3 While listening to the playback sound on the tape, advance or rewind the tape using the SHUTTLESEARCH dial. Then, near the point where you want to insert a Start ID, press the ID WRITE button. The start ID indicator will flash, a Start ID will be recorded where the sound begins, and the indicator will illuminate for about 9 seconds. In this automatic program number recording mode, Start ID's about 9 seconds long will also be automatically recorded one after another where sound begins.

To cancel the auto mode:

- 1 Press the STOP button. The indexing function will be released.
- 2 Press the PNO/START ID AUTO button. The pno/start ID auto indicator will go out.

2) Manual recording

In this method, Start ID's can be recorded on the tape at any desired position. Check if the pno/start ID auto indicator is illuminated. If it is, press the PNO/START ID AUTO button to cancel.

- 1 Press the START ID button. The start ID indicator flashes.
- 2 While listening to the playback sound on the tape, advance or rewind the tape using the SHUTTLESEARCH dial. Then, at the point where you want to insert a Start ID, press the ID WRITE button. The start ID indicator illuminates for about 9 seconds and then goes out. A Start ID (approx. 9 sec.) will be recorded at the point where the button was pressed. Then the unit is ready for inserting the next Start ID.
- 3 Repeat steps 1-2 to insert Start ID's one after another wherever desired.

Note: Do not press the STOP button when the start ID indicator is illuminated (approx. 9 sec.) in both Automatic/Manual Recording. If the STOP button is pressed, the Start ID will not be recorded long enough to be detected upon playback.

Start ID's may be recorded in either Play or Pause mode. In Play mode, they are written "on the fly" by simply listening for the desired location. In Pause mode, more accurate cueing is possible, as the Start ID may be written at a precise location by using Absolute Time as a reference.

Shuttle search

This function allows you to search rapidly forward or backward on the tape for specific sections with a high degree of accuracy while listening to the material recorded on the tape. (Refer to page 12.)

Erasing Recorded Start ID's

- 1 Press the START ID button. The start ID indicator flashes.
- 2 Turn the SHUTTLE SEARCH dial to run the tape to the point where you want to erase a start ID. When the tape reaches the position at which a Start ID was recorded, the start ID indicator illuminates to show the presence of a Start ID.
- 3 Press the ID ERASE button. The erase indicator illuminates. The tape is then rewound to find the Start ID and erasure begins just before the beginning of the Start ID. (During this time, the erase indicator illuminates, and the start ID indicator flashes.) After erasure, both indicators go out.
- 4 Repeat steps 1-3 to erase subsequent ID's, if necessary.

Hint: If you wish to erase all Start ID's on a tape, it is best to start at the end of the tape. By default, the unit searches for ID's in reverse direction during ID Erase mode.

Assigning Sequence Numbers to Recorded Start ID's

After recording or erasing of Start ID's and confirmation that all Start ID's are in the correct location, press the RENUMBER button. The tape will rewind to the beginning, the unit searches for the recorded Start ID's, and automatically assigns program numbers to them in sequence starting from 01. When the tape reaches the end, the renumber function is complete, and the tape is rewound to the beginning again. While the tape is running, the play indicator flashes. Each time the tape comes to a position where a Start ID has been recorded, the start ID indicator illuminates.

To set the first program number when renumbering:

- 1 In the stop or standby mode, use the program number buttons on the remote control transmitter to input the program number to be renumbered first.
The program number input flashes on the program number display.
- 2 Press the RENUMBER button.
Renumbering commences, and the program numbers are re-assigned starting with the program number which was set.

Recording Absolute Time with the Index Function (Retime Function)

Even on tapes where absolute time has not been recorded, it can be recorded while indexing is being carried out.

- 1 Enter the auto mode. The pno/start ID auto indicator will illuminate.
- 2 Press the START ID button to put the unit in Start ID recording mode. The start ID indicator will flash.
- 3 Press the REW/REV button to rewind the tape to the beginning. Confirm that the display shows "0:00:00".
- 4 Press the ID WRITE button.
Start ID's will be recorded on the tape automatically, together with absolute time. Audio recorded on the tape remains unaffected.

If program numbers, Start ID's, Skip ID's and End mark have been recorded in any part of the tape, they are all erased during a new recording.

After the absolute time is recorded up to the end of the tape or recorded part, the unit enters stop mode.

Note: If there is a blank, unrecorded part at the start of the tape, it is necessary to run the tape in recording mode up to the point which is already previously recorded. Otherwise, Absolute Time will not be recorded.

Recording and Erasing a Skip ID

Skip ID causes the unit to go into fast-forward mode until the next Start ID is reached, in order to skip unwanted material. Skip ID's can be recorded to automatically skip over parts of the tape you do not wish to hear (auto skip play function).

Note: Skip ID's can only be recorded manually.

The procedure to record and erase a Skip ID is the same as one for a Start ID, except for the following steps:

- 1 To enter the Skip ID recording or erasing mode, press the SKIP ID button, instead of the START ID button. The skip ID indicator flashes.
- 2 When the ID WRITE button is pressed to record a Skip ID, the skip ID indicator will illuminate for about one second.

Canceling the auto skip play function

When Skip Play Cancel is turned on, Skip ID's are ignored. When a Skip ID is encountered in this mode, the skip ID indicator lights, but tape play continues uninterrupted.

The auto skip play mode is set ON when the power is turned on if it was on when the power was last turned off and it is set OFF if it was off when the power was last turned off. Hence, if you want to cancel the auto skip play function, press the SKIPPLAY CANCEL button to enter the auto skip cancel mode. The skip play cancel indicator will illuminate.

Recording and Erasing the End Mark

Recording the End mark

- 1 After recording (in record standby mode), press the AUTO REC MUTE button. Approx. 4 seconds of silence will be recorded, and the unit returns to record standby mode.
- 2 Press the END button. The end indicator flashes.
- 3 Press the PLAY button. The end indicator lights.

While the End mark is being recorded (for approx. 9 seconds), "EE" appears on the program number display. Any recorded music at the End mark is erased.

After the End mark is recorded, the tape is automatically rewound to the beginning of the End mark, and the unit enters stop mode.

Indexing mode of the End mark will be released automatically.

Erasing the End mark

- 1 Press the END SEARCH button. After the tape is rewound to the beginning automatically, the End mark will be searched, and the unit enters stop mode. While the end search is being carried out, "EE" flashes on the program number display.
- 2 Press the REC button. The rec and pause indicators illuminate.
- 3 Press the PLAY button. Recording starts and the End mark will be erased.
During the normal recording, the End mark will be automatically erased, so that recording can be continued.

System Display Mode

The SV-3800 has several operating parameters that can be accessed by the front panel display. In system display mode, these parameters may be checked or altered. The values set in this mode are retained when the power is turned off.

(1) Entering the system display mode

Press the COUNTER MODE + COUNTER RESET + PAUSE buttons (=DISPLAY FUNCTION SELECTORS) simultaneously.

Recorder is set to the digital input/output terminal selection mode (mode No.0) of system display mode. "0-" appears on the program number display.

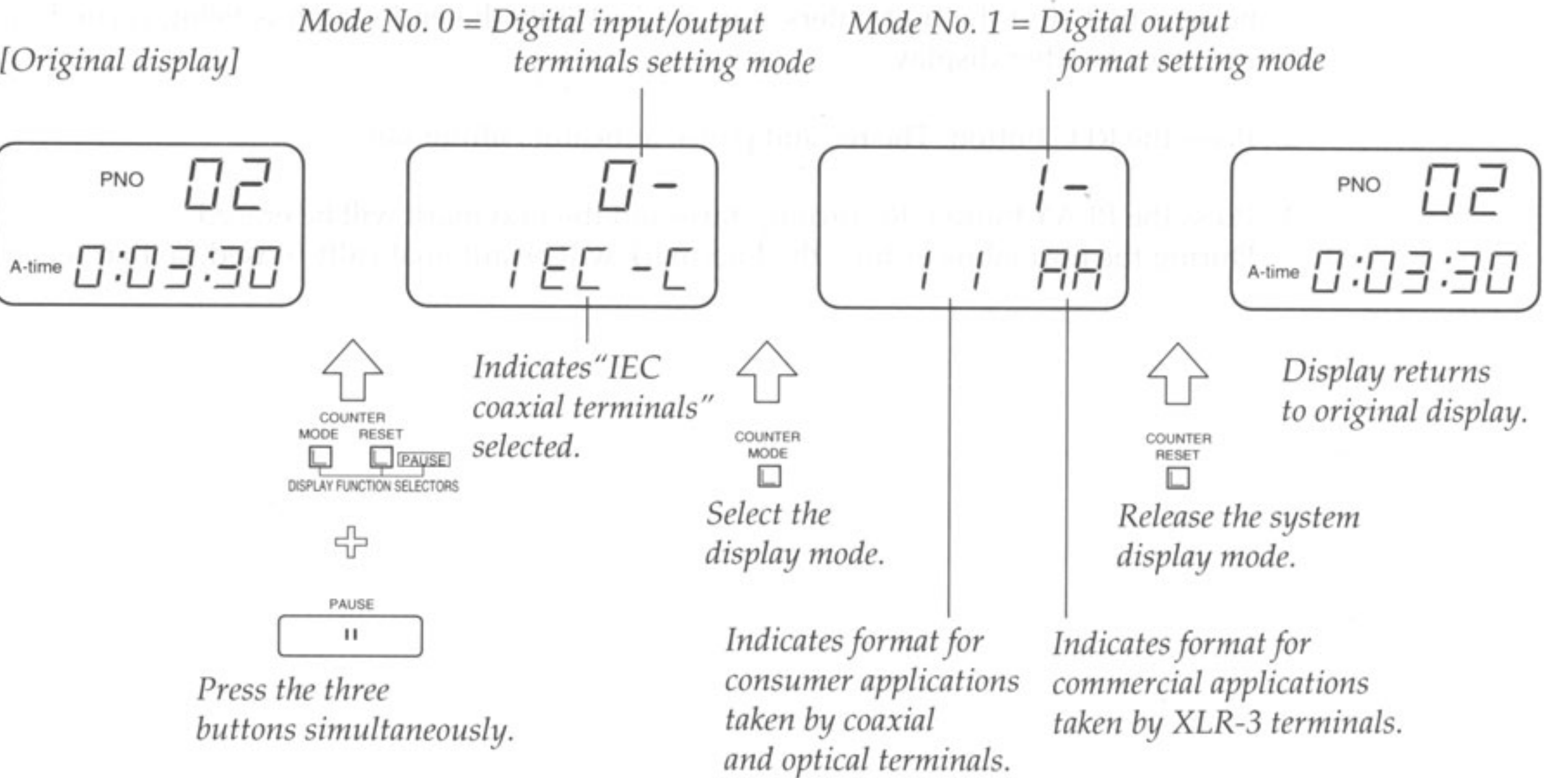
(2) Selecting the display mode

Press the COUNTER MODE button.
Each time the button is pressed, the display mode changes in the order of the mode number.
The mode No. of the selected display mode is displayed.

(3) Returning to the regular display (releasing the system display mode)

Press the COUNTER RESET button.

Selecting the system display mode:



Mode Displays and Their Setting Methods

Selecting the digital input/output terminals (mode No.0)

What is displayed	Actual display	Significance
The currently selected terminals appear on the counter display.	1) IEC-C	"Coaxial terminals" selected.
	2) IEC-0	"Optical terminals" selected.
	3) AES	"XLR-3 terminals" selected.

To change the setting:

Press the SKIP button (forward). The display changes in the sequence of 1) through 3) above, thus changing the terminals selected. The setting established after initialization is "IEC-C".

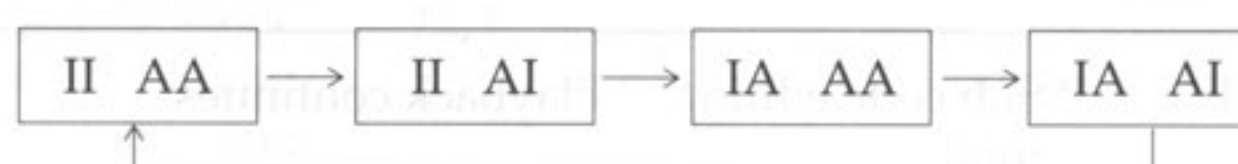
Notes: When "IEC-C" or "IEC-0" has been selected, the digital output signals are supplied from both the coaxial and optical terminals. When "AES" has been selected, the digital output signals are supplied from the XLR-3 terminals only.

Selecting the digital output mode (mode No.1)

What is displayed	Actual display	Significance
The output mode (format for commercial or consumer applications) of the digital output terminals appears on the counter display.	1) II	Format for consumer applications taken by coaxial and optical terminals.
According to standards, the coaxial and optical terminals are for IEC consumer use. The XLR-3 connectors are for AES/EBU professional use. In order to increase compatibility with equipment using non-standard digital interfaces, this display permits the format and interface connectors to be interchanged. For example, AES/EBU may be sent to the coaxial and optical connectors, while IEC may be sent to the XLR connectors.	2) IA	Format for commercial applications taken by coaxial and optical terminals.
	3) AI	Format for consumer applications taken by XLR-3 terminals.
	4) AA	Format for commercial applications taken by XLR-3 terminals.

To change the setting:

Press the SKIP button (forward). The display changes in the sequence shown below, thus changing the output format. The settings established after initialization are "II" for the coaxial and optical terminals and "AA" for the XLR-3 terminals, which is the standard for IEC and AES/EBU.



Selecting the error rate display (mode No.2)

What is displayed	Actual display
1) The total error rate for data played back by head A and head B appears on the counter display.	"A" and "B" light on the display. The error rate is indicated by (the value displayed/9984).
2) The error rate for data played back by head A appears on the counter display.	Only "A" lights on the display. The error rate is indicated by (the value displayed/4492).
3) The error rate for data played back by head B appears on the counter display.	Only "B" lights on the display. The error rate is indicated by (the value displayed/4492).

To change the setting:

Press the SKIP button (forward). The display changes in the sequence of 1) through 3) above.

Selecting the single play mode (mode No.3)

Single play is a function which suspends playback when a Skip ID or Start ID which has been recorded is detected during playback.

Basically, when single play mode is on, the unit will playback normally until the next Start ID or Skip ID is encountered. The tape will then "park" in PAUSE mode so the next selection is ready for playback at any time. To resume playback, simply press the PLAY button.

What is displayed	Actual display	Significance
The present single play mode setting appears on the counter display.	1) SP- - -	The single play mode has been set to off.
	2) SP-00	The single play mode has been set to on.

The unit operates as follows depending on the operating mode.

Note: Single play mode does not take effect during Program Play, such as when programming a random sequence of selections using the program number and MEMORY buttons on the remote control.

When a Skip ID recorded is detected during playback:

Sequence of priority	Operating mode	When the single play mode is off (normal)	When the single play mode is on
1	* Sub code editing mode	Playback continues.	Playback continues.
2	Skip play cancel mode	Playback continues.	PAUSE mode is established.
3	Skip play mode	The tape advances to the next Start ID and playback mode is established.	The tape advances to the next Start ID and pause mode is established.

When a Start ID recorded is detected during playback:

Sequence of priority	Operating mode	When the single play mode is off (normal)	When the single play mode is on
1	* Sub code editing mode	Playback continues.	Playback continues.
2	Other mode Cancel mode	Playback continues.	PAUSE mode is established.

* Sub-code editing mode: refers to when the Start ID or Skip ID indicator is flashing after either of those buttons has been pressed.

To change the setting:

Press the SKIP button (forward). The mode is switched alternately between on and off. The setting established after initialization is "OFF".

Note: Any ID recorded is ignored if it is detected during the first for two seconds after playback starts.

Selecting the program playback blank skip mode (mode No.4)

Program playback blank skip determines which way the SV-3800 recognizes the end of a program. This is necessary for program play since the machine must skip to a selection at another location on the tape when the currently playing program ends.

When blank skip mode is on, the machine skips to the next programmed selection as soon as it encounters audio level below selected detection level for 2 seconds or more. When blank skip mode is off, the machine skips to the next programmed selection as soon as it encounters the next Start ID or Skip ID following the present program.

What is displayed	Actual display	Significance
The present program playback blank skip mode setting appears on the counter display.	1) PS-00	The program playback blank skip mode has been set to on.
	2) PS- - -	The program playback blank skip mode has been set to off.

To change the setting:

Press the SKIP button (forward). The mode is switched alternately between on and off. The setting established after initialization is "ON".

Note: If the Start ID recorded is detected at the beginning of a blank section, the blank is not skipped until the playback of the recorded section is completed.

Selecting the main ID6 display (mode No.5)

(1) SCMS

The Serial Copy Management System (SCMS) is designed to control digital-to-digital DAT copying that a consumer can perform on various digital audio material, including Compact Discs, pre-recorded DAT tapes, and other material via IEC 958 "consumer use" digital audio interfaces (also commonly referred to as "S/PDIF"). SCMS does not affect the ability to make copies using a DAT recorder's analog inputs and outputs.

Only one serial (or generational) digital-to-digital copy can be made from a copyright protected source, such as a commercial CD or pre-recorded DAT. Serial Copy Management System labels are generated onto tape each time an SCMS-equipped consumer DAT machine records an audio signal to tape, no matter whether the source is from the analog or digital inputs.

(2) Setting the main ID6

Technically, the SCMS labels for DAT are encoded into the sub code sections of the main digital data area, specifically "main ID6". The SV-3800 allows the user to preset the SCMS status bits of main ID6 onto the DAT recording. For legal reasons, the ID6 bits are only modified if the source input is the AES/EBU Digital I/O; analog input during digital copying via the IEC "consumer use" input, the SV-3800 simply copies across the current status of SCMS codes from the source tape.

What is displayed	Actual display	Significance (When using consumer- type DAT recorder)
The two digits on the left show the value of main ID6 that are user-selectable and will be recorded onto tape when using the analog inputs or the AES/EBU Digital Input terminal. The two digits on the right show the actual main ID6 value recorded on the tape.	1) 00	ID6 value set to 00: Copy-free. Unlimited digital copies can be made from the source tape or its copies.
	2) 11	ID6 value set to 11: Copy-restricted. Digital copies can be made from the source tape with this code, but the copies cannot be duplicated digitally.
	3) 10	ID6 value set to 10: Copy-prohibited. Digital copies cannot be made using a consumer type DAT Recorder.

Display example: When "11P00" is displayed

The first two digits denote the value of main ID6 which is "user-selectable bits" and to be recorded onto the tape during recording. In this case, these digits are "11."



The last two digits denote the value of main ID6 which has been recorded onto the tape being played back. In this case, these digits are "00."

To change the setting:

Press the SKIP button (forward). The display changes in the sequence of 1) through 3) above, thus changing the value of main ID6 which is to be recorded onto the tape during recording. The setting established after initialization is "00."

Setting the nominal output level (mode No.6)

Various types of audio equipment work at different reference levels. The nominal output level reduces the level of the analog outputs. This feature makes it possible to vary the analog output level over a 14 dB range. This virtually eliminates any likelihood of level incompatibility with other equipment.

(1) Nominal output level setting methods

This level can be set in the following 2 ways.

- 1) The level is set using the SKIP buttons or SHUTTLE SEARCH dial in +4 dBu to -6 dBu nominal output level mode.
- 2) The level is set using FF or REW buttons for selecting +4 dBu (changeable) or -10 dBu nominal output level mode.

(2) Setting the nominal output level

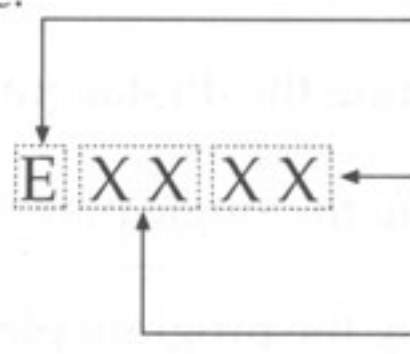
Button operated	Operation	Display
FF/CUE button	This button establishes the mode in which the nominal output level can be set to any value between +4 dBu and -6dBu.	Example: A 04
SKIP button (forward or reverse)	Each time the forward button is pressed, the setting is incremented by 1 to +4, each time the reverse button is pressed, the setting is decremented by 1to -6.	
SHUTTLE SEARCH dial	The setting is continuously incremented or decremented by turning the dial in the REVERSE or FORWARD direction.	
REW/REV button	the setting is on -10dBu	A-10

Displaying the head cylinder rotation time (mode No.7)

This is an hour meter which increments any time the head cylinder rotates.
The total cylinder rotation time is indicated on the counter display in 5 digits (hours).
Use this as a guide to determine when your recorder needs maintenance.

Displaying the error codes, etc. (mode No.8)

The following four test results appear on the counter display.

What is displayed	Description of function	Actual display	Significance
1) Error code	Display of the system controller and mechanism controller error codes. When the cassette tray is opened, the error code display mode is released. These codes are primarily to aid diagnosis of any malfunction. Refer to qualified service personnel if you should ever experience a problem.	Example: 	Denotes that this is the error code display mode. Mechanism controller error code System controller error code
2) Microcomputer operation mode	Not available to users	—	—
3) Microcomputer software version	The version of the system controller is displayed.	Example: "1-00"	In this case, version 1.00 is denoted.

To select what is to be displayed:

Press the SKIP button (forward). The display is changed in the sequence of 1) through 3) above, and the test results are displayed.

Displaying the peak level (mode No.9)

The display of the peak level extends as far as the digit occupying the first decimal place at around the nominal level of -18 dB (-16.8 to -19.3 dB) and around the full scale level (0 to -3 dB), and as far as the rightmost digit of the whole number if the level is outside these ranges.

"-EE-E" appears if the peak level is exceeded. (included full scale)

Button operated	Operation	Display
SKIP button (forward)	The peak level of the left channel is indicated if "A" is displayed. When the SKIP button is pressed, "B" is displayed, and the peak level of the right channel is indicated.	Example -18-1 (indicates -18.1 dB)

Re-initializing all stored data settings

Press the COUNTER MODE + COUNTER RESET + PAUSE buttons simultaneously.

Now release only the PAUSE button, and press the STOP button.

All the settings except for the value indicated for the cylinder rotation time are reset to the initialized value.

When this operation is received, "00000" appears on the counter display.

List of settings which are retained even when the power is turned off

Setting to be retained	Setting in the system display mode	Initialization setting
Selecting the digital input/output terminals	●	IEC-C
Selecting the digital output terminals mode	●	II AA
Setting the single play mode	●	OFF
Setting the program play blank skip mode	●	ON
Selecting the main ID6 to be recorded	●	ID6=00
Setting the monitor nominal output level	●	+4 dBu
The total cylinder rotation time	●	No initialization possible
Setting the PNO/START ID AUTO mode	—	ON
Setting the SKIP PLAY CANCEL mode	—	ON

If "EEEEEE" appears for 1 second on the counter display when the power has been turned on:

This indicates that the data back-up function described above is not working properly.

Condensation

In winter, moisture droplets may form on the window panes of a heated room. This phenomenon is called condensation. Condensation may occur with this unit or with cassette tape in the following situations:

- in a room where a heater has just been turned on
- in a room where steam or excessive moisture are present
- when the unit is brought in suddenly from a cold place to a warm room
- when the unit is directly in the path of cold air from an air conditioner, etc.

In such cases, the unit will not operate correctly, and even if it does operate, the tape may be damaged. In particular, if moisture condenses on the rotating heads, the tape will stick. This will prevent the tape from running properly, and might damage it.

If condensation occurs

To protect the tape, this unit contains a built-in device so that when condensation occurs, the dew indicator on the display panel flashes. While the dew indicator is flashing, apart from the OPEN/CLOSE function, buttons on the unit will not operate.

If a cassette tape is loaded in the unit, remove it and leave the power switched on. Wait until the indicator goes out. The time required for moisture to evaporate will vary according to the environment, but it may be 60 minutes or longer if humidity is high. Condensation usually sets in gradually, so the indicator may not flash for the first 10~15 minutes. If room temperature or humidity changes abruptly, therefore, wait for about 20 minutes before switching on power to check that the indicator is not flashing.

Operating the unit

Always keep the cassette holder closed. If it is left open, dust will accumulate in the mechanism and cause tape playback or recording performance to deteriorate. Do not touch the inside of the cassette holder.

The top of the recorder will become hot during use, but this is perfectly normal.

Keep the replay volume low. With DAT (Digital Audio Tape recorder) cassettes, there is much less noise than with compact cassettes and a wider dynamic range. There will be a sudden burst of sound when the audio material begins. As this may damage the speakers, due care should be taken. Be especially careful when using headphones.

* Dynamic Range

Dynamic range is the difference between the lowest sound level and highest sound level, and is expressed in decibels (dB). The greater this difference, the more dynamic the recording.

When carrying or storing the unit, take care not to subject it to any severe shocks. When storing or transporting the unit, also be sure to remove the cassette tape.

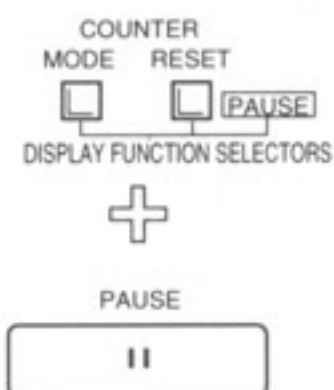
If a mechanism error occurs

This recorder unloads the tape when a mechanism error occurs in order to protect the tape. In these cases, the unit will not operate except for the OPEN/CLOSE button. After the OPEN/CLOSE function is operated and the tape is removed, the tape protection mechanism is released and all functions become valid.
(Refer to "Displaying error codes" on page 33.)

Note: When the tape snaps or is too heavy to real up, a mechanism error occurs. In these cases, press the OPEN/CLOSE button to open the tray and remove the cassette tape.
If this error occurs repeatedly, contact your nearest service center.

Quick Reference for System Display Mode Selection SV-3800

1.Entering the System Display Mode



Press the COUNTER MODE + COUNTER RESET + PAUSE buttons simultaneously.

2.Selecting the Display Mode



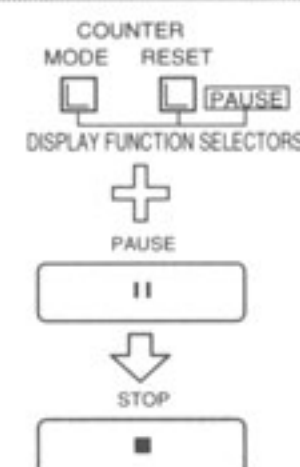
Press the COUNTER MODE button.

3.Changing the Setting



Press the SKIP button (forward).

4.Initializing the setting



Press the COUNTER MODE + COUNTER RESET + PAUSE buttons simultaneously, and then release only the PAUSE button and press the STOP button.

5.Returning to the Regular Display



Press the COUNTER RESET button.

Mode No.	System Mode	Actual Display	Significance	Setting in the System Display Mode	Initiali- zation Setting	System Back-Up
0	Selecting the digital input/output terminals	IEC-C IEC-O AES	"Coaxial terminals" selected. "Optical terminal" selected. "XLR-3" terminals" selected.	●	IEC-C	○
1	Selecting the digital output mode	II IA AI AA	Format for consumer applications taken by coaxial and optical terminals. Format for commercial applications taken by coaxial and optical terminals. Format for consumer applications taken by XLR-3 terminals. Format for commercial applications taken by XLR-3 terminals.	●	II AA	○
2	Selecting the error rate display	A and B/ "xxxx" A/"xxxx" B/"xxxx"	The total error rate for data played back by head A and head B max. 9984. The error rate for data played back by head A max. 4992. The error rate for data played back by head B max. 4992.	— — —	— — —	— — —
3	Selecting the single play mode	SP-- SP-00	The single play mode has been set to off. The single play mode has been set to on.	●	SP--	○
4	Selecting the program playback blank skip mode	PS-00 PS---	The program playback blank skip mode has been set to on. The program playback blank skip mode has been set to off.	●	PS-00	○
5	Selecting the main ID6 display	00 11 10	ID6 value set to 00: Copy-free. ID6 value set to 11: Copy-restricted ID6 value set to 10: Copy-prohibited	(User-Selectable bits at the first two digits only) ●	00	○
6	Setting the nominal output level	A04~A-06 A-10	+4 to -6 dBu (Press FF button) -10 dBu (Press REW button)	●	A04 (+4 dBu)	○
7	Hour meter	"xxxxx"	The total head cylinder rotation time is indicated in 5 digits (hours).	—	—	○
8	Displaying the error codes, etc. (For diagnostic purposes by qualified service personnel)	E" xx" xx" — "x-xx"	"E" denotes that this is the error code display mode. Microcomputer operation mode Not available to users The microcomputer software version of the system controller.	— — —	— — —	— — —
9	Peak level	A "-xx" B "-xx"	Lch peak level Rch peak level			

To clean this unit, use a soft, dry cloth. If the surfaces are extremely dirty, use a soft cloth, dipped into a soap-and-water solution or a weak detergent solution. Wring the cloth well before wiping the unit. Wipe once again with a soft, dry cloth. Never use alcohol, paint thinner, benzine, nor a chemically treated cloth to clean this unit. Such chemicals may damage the finish of your unit.

Importance of cleaning DAT heads

As with any tape-based recorder, it is essential that the SV-3800 Pro-DAT's heads are kept perfectly clean. A Panasonic DAT Head Cleaning Tape (part number RT-RCLP, optional) is available for your local dealer that automatically removes the dirt, dust and shed tape particles that gradually build up on the DAT heads.

But how do you know that the heads need cleaning? In extreme conditions the audio output will mute, but long before that happens, the slow build up of dirt and oxide will "mask" the sound, and diminish the full 16-bit audio quality from this DAT machine by causing record as well as replay errors.

An ideal solution is to make yourself a "DAT Test Tape" whose error rate you can monitor on a daily or weekly basis (depending on how often you use the SV-3800). To prepare a Test Tape, first select a high-quality DAT cassette and then record a series of music selections. Rewind the DAT cassette and monitor the Error Rates during the first several minutes of tape.

Panasonic brand DAT tapes use high-quality formulations, binders, backings and calendaring process, to provide minimum abrasiveness with maximum stability of metal particles on the tape. It is specifically designed to maximize head life of your DAT machine.

Check the Error Rates at several points in the tape and average the values. (On how to display error rates on the SV-3800, see page 29.) If the Error Rates increase to around 300, a Panasonic Head Cleaning Tape can be used as follows: Play the cleaning tape through the SV-3800 for approximately 15-20 seconds, and remove it.

DONOTREWIND the cleaning tape, since this action might very well spread previously removed dirt and dust onto an otherwise clean head and transport. After the Head Cleaning Tape has been used up, dispose of it properly and start to use a new one.

If the DAT heads become very contaminated with dirt and dust, the CLEANING indicator within the display panel will flash. In this case, use a Head Cleaning Tape as described above.

- If playback quality improves after cleaning, but then deteriorates immediately after recording or playing back several times, the cassette tape has probably reached its useful lifetime. In this case, use a new tape.
- If sound quality does not improve even after cleaning, consult your dealer.
- Cleaning tapes cannot be used for recording or playback (be sure to read also the operating instructions supplied with the tape).

Concerning DAT Cassette Tape

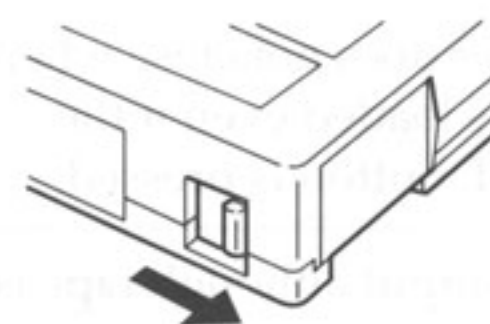
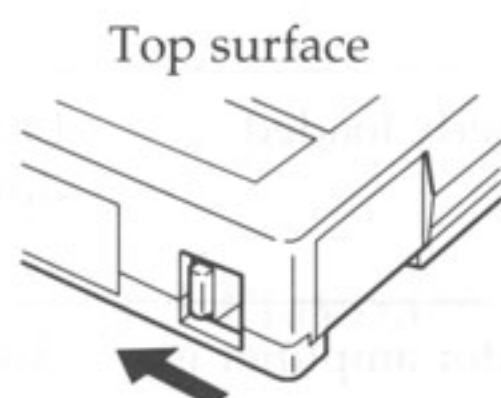
Using DAT cassette tapes

To avoid accidental erasure of valuable recordings:

Recorded tapes you want to keep can be protected by sliding the “accidental erasure prevention tab” open towards the center of the cassette with the aid of a small screwdriver as in the diagram.

When the “accidental erasure prevention tab” is open, recording cannot be performed.

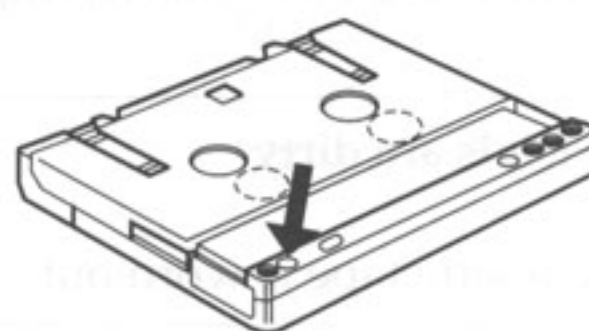
To record on the tape again, return the tab to its original position (closed).



Cassette tapes with no accidental erasure prevention tab:

Break open the hole with a small Philips screwdriver or other tool.

With this method, however, the tape cannot be returned to its original condition, and it cannot therefore be recorded again.



Cassette tapes exceeding 180 minutes:

These tapes are handy for their long playback and recording time, but be careful about repeatedly stopping and starting, rewinding and fast forwarding these tapes in short intervals as they are thin, tend to stretch and may become entangled in the deck mechanism.

Handling DAT cassette tapes

- Moisture may condense on a tape that is carried suddenly from a cold place into a warm room, so wait about 20 minutes before using it. If the tape is used with moisture on its surface, it will be damaged.
- Do not attempt to dry a cassette tape with moisture on its surface by using a hair dryer or other appliance.
- Do not open the top lid of the cassette, pull the tape out or touch it.
- Take care not to drop the cassette, hit it or subject it to violent vibration.
- The cassette mechanism has been assembled very precisely. It should on no account be disassembled.
- The cassette cannot be used on the reverse side.

Storing DAT cassette tapes

Store the cassette in its case to prevent the entry of dust. Do not leave or store the cassette in the following locations:

- Near objects with strong magnetic fields (speakers, televisions, transformers, motors or magnets).
- Places with excessive humidity (over about 80%) or dust.
- Places with high temperatures (over about 35°C).
- Places exposed to direct sunlight or heat from heating appliances. The cassette should never be left in a car dashboard or near the rear window.
- After use, rewind the tape to the beginning. If rewinding is interrupted, it may lead to creases in the tape and affect sound quality on playback.

Troubleshooting

Before requesting service for this unit, check the chart below for a possible cause of the problem you are experiencing. Some simple checks or a minor adjustment on your part may eliminate the problem and restore proper operation. If you are in doubt about some of the check points, or if the remedies indicated in the chart do not solve the problem, refer to the directory of Authorized Service Centers (enclosed with this unit) to locate a convenient service center, or consult your dealer for instructions.

Fault	Main Cause	Remedy
Unit does not record or play cassettes even though power is switched on.	There is condensation inside unit.	Wait until the dew indicator goes out.
Cassette holder does not close when a cassette tape is loaded even if the OPEN/CLOSE button is pressed.	Cassette tape is not properly loaded.	Load the cassette tape in the proper direction.
No sound is output although tape is running.	Volume control on monitor amplifier is set at minimum.	Adjust volume using amplifier volume control.
	Monitor amplifier selector is set at a position other than "DAT" or "TAPE".	Set the input selector position to either "DAT" or "TAPE" depending on the connections to the unit.
Noise or distortion is heard on playback.	Recording level was too high or too low.	Record the tape again at the optimum level.
	Heads are dirty.	Clean the heads with a DAT cleaning tape and record the tape again.
	Cassette tape is worn out.	Use a new cassette tape.
Analog recording cannot be performed.	Accidental erasure prevention tab on cassette tape is open.	Close accidental erasure prevention tab.
	Unit is not connected properly to studio equipment.	Connect unit properly.
	REC LEVEL controls is set at "0".	Adjust recording (input) level with REC LEVEL controls.
	INPUT selector is set at the digital position.	Set the INPUT selector to the analog position.
Indexing cannot be performed.	Accidental erasure prevention tab on cassette tape is open.	Close accidental erasure prevention tab.
Auto skip play cannot be performed.	SKIP PLAY CANCEL indicator is illuminated.	Press SKIP PLAY CANCEL button to turn off the indicator.
Digital signals cannot be recorded.	INPUT selector is set at the analog position.	Set the INPUT selector to the digital position.
	Digital input/output connections on rear of unit are not correct.	Make proper digital input/output connections.
	The type of digital input/output connections do not correspond with the settings.	Set the setting correctly referring to page 28.
Search function does not operate properly.	Start ID has not been recorded properly.	Record the Start ID, using the auto ID function.
Program time is not displayed properly.	Program numbers have not been recorded properly.	Add serial numbers to recorded Start IDs.
	Cassette tape has been inserted midway through a program.	Press REW/REV button and rewind to start of program.
Unit does not playback, record or operate properly.	Unit was not operated in accordance with instructions.	Switch off power, and operate again correctly in accordance with instructions.

Specifications

Signal format

Tape recording system:	Rotary head type DAT
Sampling frequencies (selected automatically):	
Analog input recording	48 kHz, 44.1 kHz
Playback/Digital input recording	48 kHz, 44.1 kHz, 32 kHz
No. of quantizing bits:	16-bit linear
No. of channels:	2 (stereo)

Digital (AES/EBU type):	
Input	XLR-3 type/110Ω balanced
Output	XLR-3 type/110Ω balanced
Digital (IEC type II):	
Input	RCA phono type (Coaxial)/75Ω, Optical
Output	RCA phono type (Coaxial)/75Ω, Optical

Audio parameters (Recording and Playback System)

Frequency response:	
fs: 48 kHz	10 Hz–22000 Hz (±0.5 dB)
fs: 44.1 kHz	10 Hz–20000 Hz (±0.5 dB)
fs: 32 kHz (only playback)	10 Hz–14500 Hz (±0.5 dB)
Total harmonic distortion:	Less than 0.03% (+4 dBu, 1 kHz)* Less than 0.007% (+22 dBu, 1 kHz)*
Dynamic range:	Greater than 92 dB*
SN ratio:	Greater than 92 dB*
Wow and flutter:	Unmeasurable

*DIN audio weighted (22.4 Hz to 22.4 kHz bandpass filter)

Remote control

Parallel remote:	8 pin DIN connector (50 functions available)
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Terminals

Analog input:	
Input jacks	XLR-3 type
Nominal input level (–18 dB rec level)	+4 dBu
Input impedance	10kΩ balanced
Analog output:	
Output jacks	XLR-3 type
Nominal output level (–18 dB)	+4/–10 dBu
Output impedance	50Ω balanced
Headphones output:	
Maximum level	30mW+30mW (32Ω)
Matching impedance	8–600Ω

Mechanism

Cylinder diameter:	30 mm
Cylinder rotation speed:	2000 r/min.
Tape speed:	
(Normal track)	8.150 mm/s.
(Wide track: Music Tape)	12.225 mm/s.
Search speed:	Up to 250 times normal playback speed
FF/Rewind speed:	Up to 250 times normal playback speed
FF/Rewind time:	Approx. 35 second (2 hours DAT tape)

General

Power consumption:	30 W
Power supply:	60 Hz, AC 120 V
External Dimensions (W×H×D):	430×122×315 mm (16 ⁷ / ₈ "×4 ³ / ₄ "×12 ³ / ₈ "
Weight:	5.9 kg (13.0lb.)

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

Panasonic Industrial Service...

For Audio/Video Products



The exact standards observed in the design and manufacture of your Panasonic product ensure that it will need an absolute minimum of necessary maintenance. However, should your unit ever require service, a nationwide system of **AUTHORIZED INDEPENDENT SERVICENTERS** is maintained by Panasonic in support of your warranty.

Panasonic also has its own **SERVICENTERS** for Panasonic audio/video products in the U.S. and Puerto Rico.

If service is not available in your community at this time, carefully pack the unit, preferably in the original cartons, and ship the product, prepaid and insured, to the most convenient **SERVICENTER**.

Terms of the warranty require that the original bill of sale, or other proof of the date of purchase must be presented when applying for In-Warranty service.

To Locate a Convenient Authorized Servicenter
(In The U.S.A.)

DIAL TOLL FREE (Anytime): **800-526-6610**

For proper assistance, tell the toll free operator you have a
Panasonic **INDUSTRIAL** Product

For your added convenience...in the U.S.A.

Panasonic Industrial Factory Servicenters

CALIFORNIA

6550 Katella Avenue
Cypress, Calif. 90630
714-373-7450

GEORGIA

1225 Northbrook Parkway-Suit170A
Suwanee, Georgia 30174
770-338-6855

ILLINOIS

1713 N. Randall Road
Elgin, Illinois 60123
708-468-5270

MARYLAND

54W. Gude Drive
Rockville, Maryland 20850
301-762-5125

In the unlikely event you experience a service problem requiring assistance from Panasonic regarding repairs, Please write to:

Customer Service Department
Panasonic Broadcast & Television Systems Company
Division of Matsushita
Electric Corporation of America
50 Meadowland Parkway 2A-3
Secaucus, N.J. 07094

Panasonic Service in Hawaii...

Please contact the dealer from whom you purchased this product to obtain service information.

Panasonic Service in Puerto Rico...

Panasonic Sales Company, Division of Matsushita
Electric of Puerto Rico, Inc. ("PSC")
Ave. 65 de Infantería, Km. 9.5
San Gabriel Industrial Park, Carolina,
Puerto Rico 00985
809-750-4300

LIMITED WARRANTY

Panasonic Broadcast & Television Systems Company or Panasonic Sales Company (collectively referred to as "Panasonic") will repair this product with new or rebuilt parts, free of charge, in the U.S.A. or Puerto Rico in the event of a defect in materials or workmanship as follows:

1. **Parts:** New or rebuilt parts in exchange for defective parts for one (1) year after original purchase.**
Labor: Carry-in or mail-in service for one (1) year after original purchase.**

**Exceptions: Audio Head Cylinder—90 days Parts/Labor

2. Carry-in or mail-in service in the continental U.S.A. can be obtained during the warranty period from a Panasonic Regional Servicer listed in the Servicer Directory. Or call 800-526-6610, toll free, to locate an authorized Panasonic Servicer. Carry-in or mail-in service in Puerto Rico can be obtained during the warranty period by calling the telephone numbers listed in the Servicer Directory.

This warranty is extended only to the original purchaser. A purchase receipt or other proof of date of original purchase will be required before warranty performance is rendered.

This warranty only covers failures due to defects in materials or workmanship which occur during normal use and does not cover damage which occurs in shipment or failures which are caused by products not supplied by Panasonic or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, faulty installation, set-up adjustment, improper maintenance, alteration, inadequate signal pick-up, maladjustment of user controls, line power surges, modification of the product, or service by anyone other than a Panasonic Regional Servicer or authorized Panasonic Servicer or damage that is attributable to acts of God.

LIMITS AND EXCLUSIONS

There are no express warranties except as listed above.

PANASONIC SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS, OR DISCS, LOSS OF GOODWILL, OR ANY ASSOCIATED EQUIPMENT, DOWNTIME COSTS, OR CLAIMS OF ANY PARTY DEALING WITH PURCHASER FOR SUCH DAMAGES, RESULTING FROM THE USE OF THIS PRODUCT OR ARISING FROM BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE OR ANY OTHER LEGAL THEORY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

If a problem with this product develops during or after the warranty period, you may contact your dealer or Servicer. If the problem is not handled to your satisfaction, then write to the Consumer Affairs Division at the company address indicated on the Panasonic Servicer list.