SONY

STEREO TAPECORDER

TC-377

OWNER'S INSTRUCTION MANUAL

TABLE OF CONTENTS

The SONY Model TC-377 is a three-head, four-track stereo tape deck designed for serious home recordists. The highly developed facilities of the TC-377 will offer a new world of sound when used in conjunction with quality high fidelity components.
Special features are: SONY high performance F&F (Ferrite & Ferrite) heads; Microphone level attenuation switch; scrape filter which eliminates tape modulation distortion; tape tension regulator to reduce wow and flutter; Automatic shut-off mechanism; Tape select switch for low-noise, high-output tapes; microphone and line mixing; sound-on-sound recording; echo recording; slant cabinet designed for convenience of operation in either horizontal or vertical position, etc.

In addition to these professional features, the Model TC-377 is also designed to record and play back encoded SQ (Stereo/Quadraphonic) signals with true fidelity. Refer to "SQ RECORDING" on page 15.

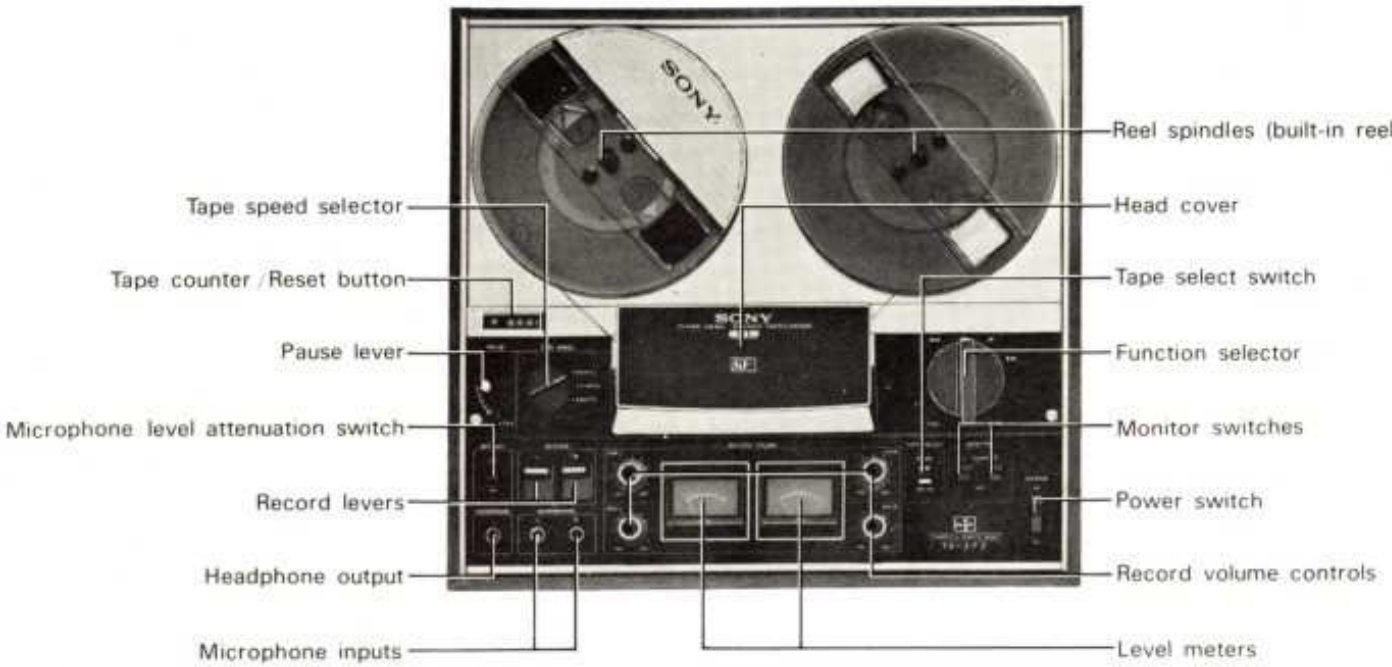
Before operating, read this manual carefully to become familiar with all features and operating procedures so as to realize the full capabilites of the Model TC-377. Keep this manual handy for future reference.

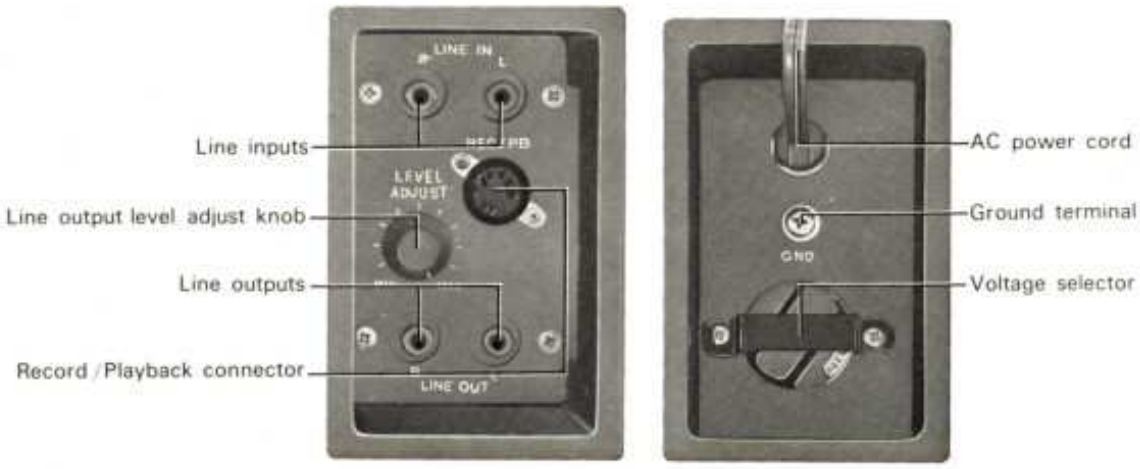
This tape recorder is fixed for use in countries where AC 120V is available. For use in Japan on AC 100V, consult your SONY Service Station or SONY dealer.
For use in other countries either on AC 110V, 127V, 220V, or 240V, consult your SONY Service Station or SONY dealer in such countries.

PRECAUTIONS

1. The Function selector of the TC-377 cannot be locked in any mode without first threading tape, since the Automatic shut-off mechanism is activated in that conditon.
2. Turn the Function selector to ■ (STOP) and switch the power off when the recorder is not being used.
3. The Microphone inputs and Line inputs of this recorder can be used simultaneously for mixing.
   To record only through the Microphone inputs, disconnect any input source from the Line inputs and vice versa. Turn the undesired source control fully counterclockwise.
4. Do not connect any input source to the Microphone inputs when the Record/Playback connector is being used for recording. Otherwise, the signal through the Microphone inputs will be recorded.
5. Keep the heads and all surfaces over which the tape travels clean in order to assure optimum performance. For cleaning information, refer to "MAINTENANCE" on page 11.
6. Keep the recorder in a well ventilated area and away from any excessive heat.
7. Do not block the ventilation grille at the back of the recorder as this may stop ventilation and cause excessive heat inside the recorder.
8. For normal operation, set the Line output level adjust knob at MAX.

LOCATION OF CONTROLS AND CONNECTORS





CONNECTIONS

The Model TC-377 can be connected to any high-quality audio components.
The connections described in this booklet are for connecting between the Model TC-377 and other SONY components. When using other manufacturer's components, the connections will be the same as for the SONY products in almost all cases. To assure correct matching of the input and output terminals of your sound system, refer to the specifications of the TC-377 (on page 13) and the instruction manual provided with the components to be connected.

Caution . . . Connection with an amplifier

Amplifier without tape monitor switch :
When the tape recorder is connected to an amplifier which does not have a tape monitor switch, do not set the input selector of the amplifier to the same input position which the tape recorder is connected to.

Amplifier with tape monitor switch :
When several tape recorders are connected to an amplifier equipped with a tape monitor switch, only one tape recorder can be used in conjunction with the tape monitior capability. When recording on the other tape recorders connected to the regular auxiliary inputs of the amplifier, do not set the input selector to the auxiliary input position.
If these precautions are not observed, oscillation may occur while recording. The cause of this oscillation is feedback of the output of the recorder to its own input through the input selector of the connected amplifier. This occurs when that selector is accidentally set to the auxiliary input which this same recorder is connected to. This oscillation could be detrimental to the amplifier and/or speakers. It is recommended that the volume control of the connected amplifier be turned down when changing the position of the input selector switch.

Line inputs
Connect the recording outputs of the amplifier or component system to the LINE INputs of the TC-377.

Line outputs
Connect the LINE OUTputs of the TC-377 to the tape inputs (may be marked "TAPE" or "AUX IN" of the amplifier or component system.

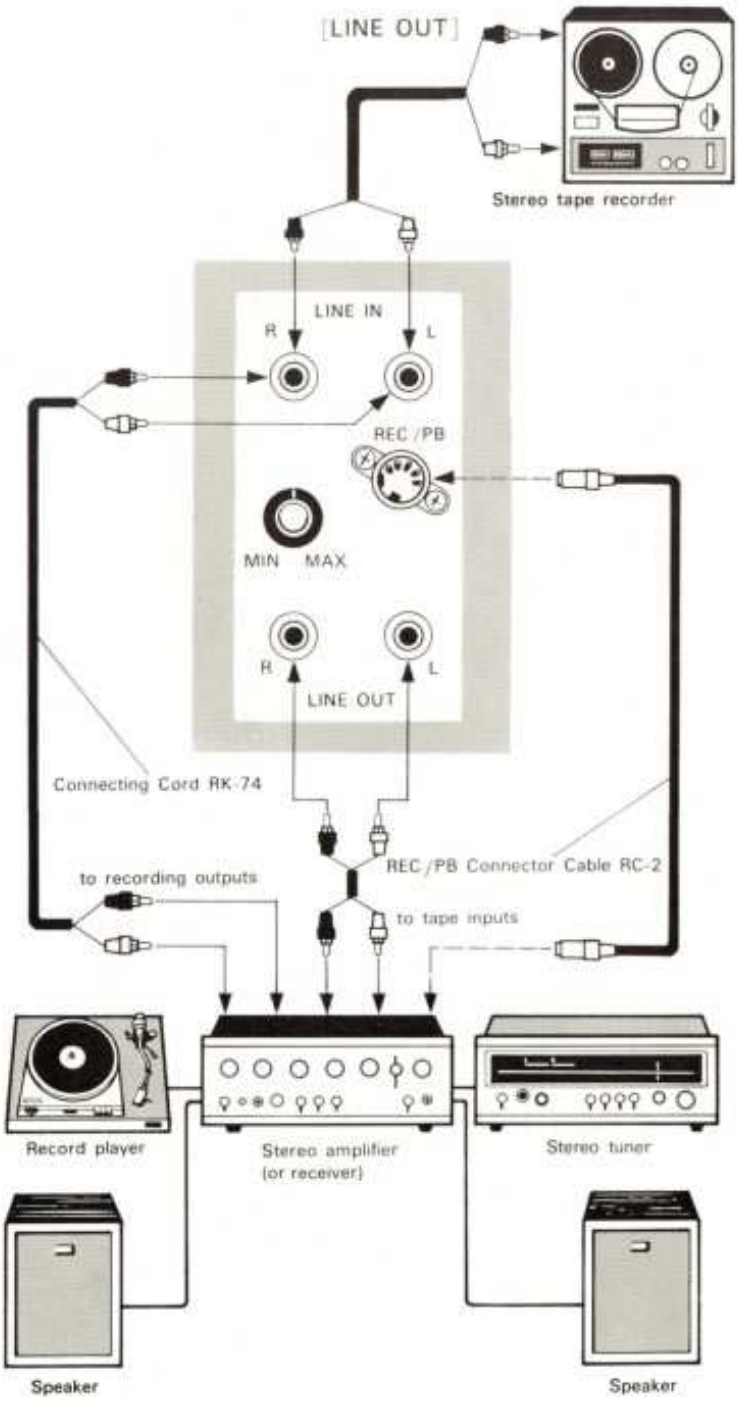
Record/Playback (REC/PB) connector
If an amplifier or receiver has the same type connector as this, the record/playback connections can be made with a single cable, SONY Connector Cable RC-2 (optional).
When using the LINE INputs, be sure to disconnect the cable from this connector, or both inputs are mixed.
To record through this connector, disconnect any input source from the MICROPHONE inputs and be sure to set the Microphone level attenuation switch at OFF. Otherwise, only the sounds through the MICROPHONE inputs will be recorded.

Microphone inputs
These inputs will accept any high quality low impedance microphones equipped with a phone plug. SONY ECM-19B or ECM-21 is recommended.

Headphone output
This output will accept a stereo headphone of 8 ohms equipped with a standard binaural headphone plug. Source monitoring and tape monitoring can be done by selecting the setting of the Monitor switches. SONY Stereo Headphone DR-4A or DR-5A is recommended.

Line output level adjust knob
To match your equipment, output levels through the LINE OUTputs can be adjusted by turning the LEVEL ADJUST knob either toward MAX or toward MIN.
Reference : MAX . . . rated output level of 0 dB (0.775V).
MIN. . . . −20 dB (77.5 mV)

Ground terminal
If hum noise occurs, connect the GND terminal to an appropriate external ground. Hum noise may be reduced.



OPERATION OF CONTROLS

Tape Transport Section

Tape speed selector

7½ ips and 3¾ ips are ideal for recording music when best sound quality is desired. 1⅞ ips is ideal for speech, especially when longer recording time is desired.

In playback mode, set the tape speed selector corresponding to the speed of the recorded tape.

- Change the tape speed only when the Function selector is at ■ (STOP) position.

Tape counter

Indicates the approximate amount of tape used in recording or playback mode. To reset the tape counter to [0000], depress the Reset button at the left side of the counter.

Pause lever

Instantly stops tape motion while the recorder is in either record or playback mode.

Pull the lever toward arrow direction. To release, push it back slightly. The tape will immediately pick up normal forward speed.

- When the Function selector is turned to ■ (STOP) position, the Pause lever will also be released.

Function selector

Controls all tape motion.

- ▶ (FWD) position .....to start the tape in either record or playback mode
- ■ (STOP) position.....to stop the tape
- ◀◀ (REW) position .....to rewind the tape
- ▶▶ (FF) position .....for fast forward tape motion

Record Amplifier Section

Microphone level attenuation switch

Reduces the microphone input level by −20 dB with its switch at ON and prevents overload of the TC-377 preamplifier, resulting from the pickup of an excessively high level sound source. For normal operation, set this switch at OFF.

Record levers

For recording a stereo program, simultaneously depress both Record levers and turn the Function selector to ▶ (FWD). The lamps above the Level meters will illuminate, indicating that the recorder is in record mode.

- When a monophonic program is desired, simultaneously depress either L or R Record lever and turn the Function selector to ▶ (FWD).

Record volume controls

For record volume control, set the Monitor switches to SOURCE. Then adjust the Record volume controls so that the meters do not swing into the red area except on program peaks.

The upper two knobs marked LINE are for adjusting the input level through the Line inputs; the other two marked MIC are for adjusting the input level through the Microphone inputs.

Level meters

While recording (set the Monitor switches to SOURCE), the swing of the needles indicates the level of input signals. During playback (set the Monitor switches to TAPE), the meter indicates the output level at Line outputs.

Monitor switches

For playback of tapes, set the switches to TAPE position. While recording, the TAPE position is for tape monitoring and the SOURCE position is for source monitoring.

Switch L and switch R may be activated separately.

Tape select switch

When you use SLH (SONY Low-noise High-output) tape, set this switch to SPECIAL. For standard tape, set the switch to NORMAL.

Under the Head Cover

Scrape filter

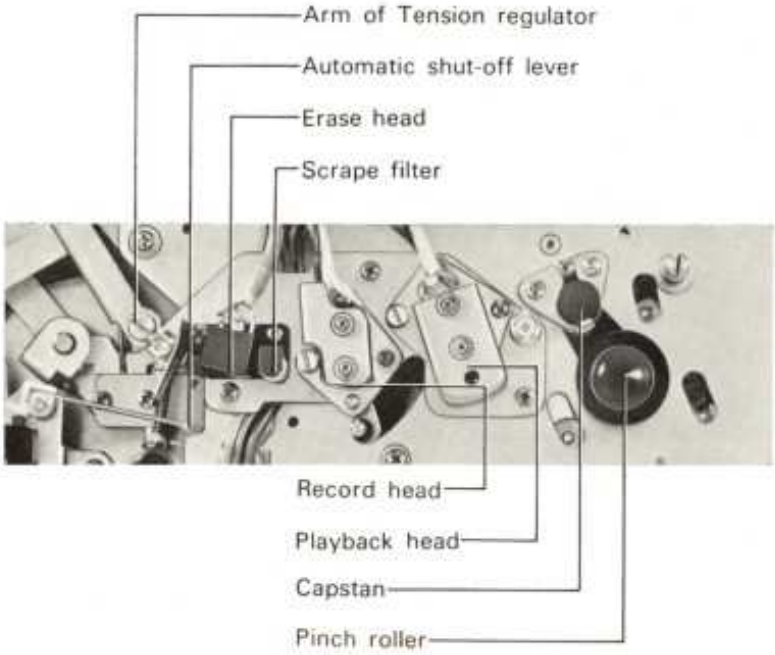
Stops vibration of the tape to eliminate tape modulation distortion and reduce flutter.

Tape tension regulator

Controlled by a guide pin located under the head cover. The guide pin quickly responds to any subtle change of tape tension so that a smooth, even flow of tape past the head assembly is assured.

Automatic shut-off mechanism

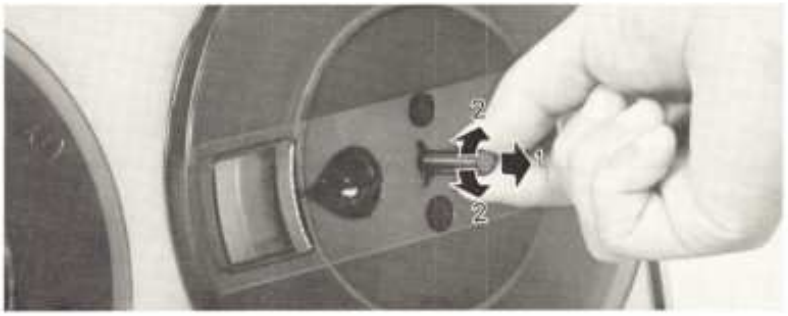
Activated by a wire lever under the head cover. When the tape is threaded, the tape contacts the lever and holds it in operating position. If the tape runs out or breaks, the lever will fall forward and activates the shut-off mechanism which stops the tape transport and returns the Function selector to ■ (STOP).

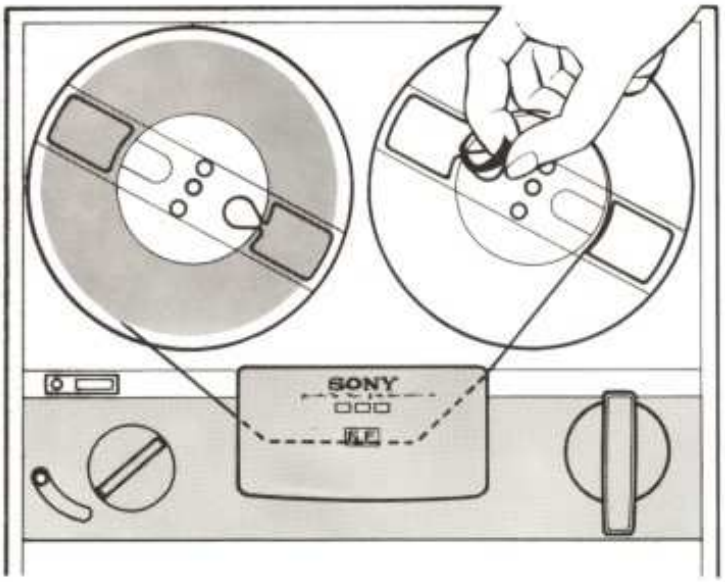


TAPE THREADING

Place an empty reel on the take-up (right) reel spindle and a full reel on the supply (left) reel spindle. Lock the reels with the built-in reel locks: Pull out the three-pronged guide which protrudes through the reel and lock by turning it slightly.
Thread the tape from left to right by passing it under the head cover and wrapping it around the hub of the right reel or inserting the end of tape into the reel slot. Rotate the reels a few times to take up the slack so that the automatic shut-off switch assumes playing position.

- It is recommended that the same size reels be used for both supply and take-up.
- When the recorder is used vertically, be sure to use the built-in reel locks to secure the reels in place.





STEREO RECORDING

Connect the desired source program to the Line inputs or Microphone inputs. Refer to "CONNECTIONS" on page 4.

1. Turn on the Model TC-377 (and source equipment) and the LEVEL meters will illuminate. Thread the tape with side 1 up.
2. Set the TAPE SELECT switch to either the SPECIAL or NORMAL.
   Set it to SPECIAL when SONY Low-noise High-output tape or equivalent is used and to NORMAL when standard tape is used.
3. Set the MONITOR switches to SOURCE.
4. Select the tape speed.
5. Adjust the recording level.
   Turn the Record volume controls:
   The input level through the LINE INputs can be adjusted with the upper two control knobs marked LINE-L and LINE-R; the input level through the MICROPHONE inputs can be adjusted with the lower two control knobs marked MIC-L and MIC-R. In either case, adjust the level so that the needles of the LEVEL meters do not go into the red area except on program peaks.
6. Set the Tape counter reset button to quickly locate the starting point of the tape in playback.
7. While depressing the RECORD levers, set the Function selector to ▶ (FWD).
   Recording of side 1 (tracks 1 and 3) begins. The lamps above the LEVEL meters will illuminate in red, indicating that the recorder is in record mode.
8. When the recording is finished, set the Function selector to ■ (STOP).

To record on side 2 (tracks 4 and 2), do not rewind the tape. Reverse reel positions and repeat step 7.
When side 2 recording is finished, do not rewind the tape but reverse reel positions. Then the tape will be ready for playback of tracks 1 and 3.

Reverse and invert the tape reels

Monitor while recording

The professional feature of separate record and playback heads permits monitoring of tape during recording by setting the MONITOR switches to TAPE. With the use of a stereo headphone, instantaneous comparison of source and tape is possible by setting the MONITOR switches alternately to SOURCE and TAPE: The source signal is monitored when the switches are in SOURCE. The recorded signal (playback head output) is monitored when the switches are in TAPE.

- When the amplifier being used is equipped with a tape monitor selector, source/tape comparison can be done with the amplifier. In such case, the MONITOR switches on the recorder should be in TAPE.

STEREO PLAYBACK

Set up the stereo playback system and turn the operating power of each component on. For connection information, refer to page 4.

1. Thread a 4-track stereo recorded tape with side 1 up.
2. Set the TAPE SELECT switch to the proper position according to the type of tape used.
3. Set the MONITOR switches to TAPE.
4. Set the tape speed selector to the required speed of the recorded tape.
5. Set the Function selector to ▶ (FWD).
   Playback of tracks 1 and 3 will start.
6. At the end of playback, set the Function selector to ■ (STOP).

To play back side 2 (tracks 4 and 2), do not rewind the tape, but reverse the reel positions. Then, set the Function selector to ▶ (FWD). Playback sound volume and tone quality are controlled with the connected amplifier.

For private listening

Connect SONY Stereo Headphone DR-4A, DR-5A or any 8-ohm stereo headphone to the HEADPHONE output.

MONOPHONIC RECORDING AND PLAYBACK

The sequence of monophonic recording and playback should be track-1, track-4, track-3 and track-2.

Recording

The monophonic recording procedure is the same as with stereo recording except only one RECORD lever is used.
For recording on track-1 and track-4, use the left channel input and left record volume control; for recording on track-3 and track-2, use the right channel input and right record volume control.

Sequence of recording track	Input connection	Record volume control	Use record lever
Track-1	to L input	MIC-L or LINE-L	L
Track-4			
Track-3	to R input	MIC-R or LINE-R	R
Track-2			

Playback

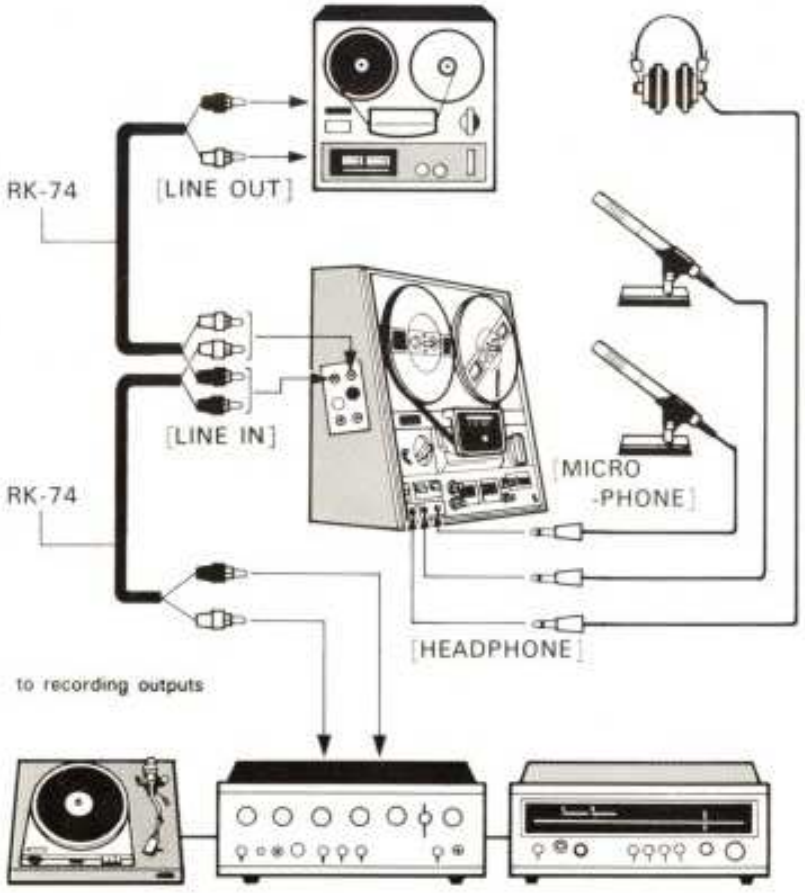
Playback sequence of the tape should conform to the sequence of recording, i.e. track-1, track-4, track-3 and track-2.
For playback of track 1 and track-4, set the mode selector and/or other controls of the amplifier to reproduce the left channel only; For playback of track-3 and track-2, set the amplifier to reproduce the right channel only.

SPECIAL OPERATIONS

Microphone and Line Mixing

When the MICROPHONE inputs and LINE INputs are connected to their respective sound sources, these input signals are recorded (mixed) together either stereophonically or monophonically.
For recording procedure, refer to "STEREO RECORDING" on page 6 or "MONOPHONIC RECORDING" on page 7.

- The mixed sound can be monitored through a stereo headphone.



Sound-on-Sound Recording

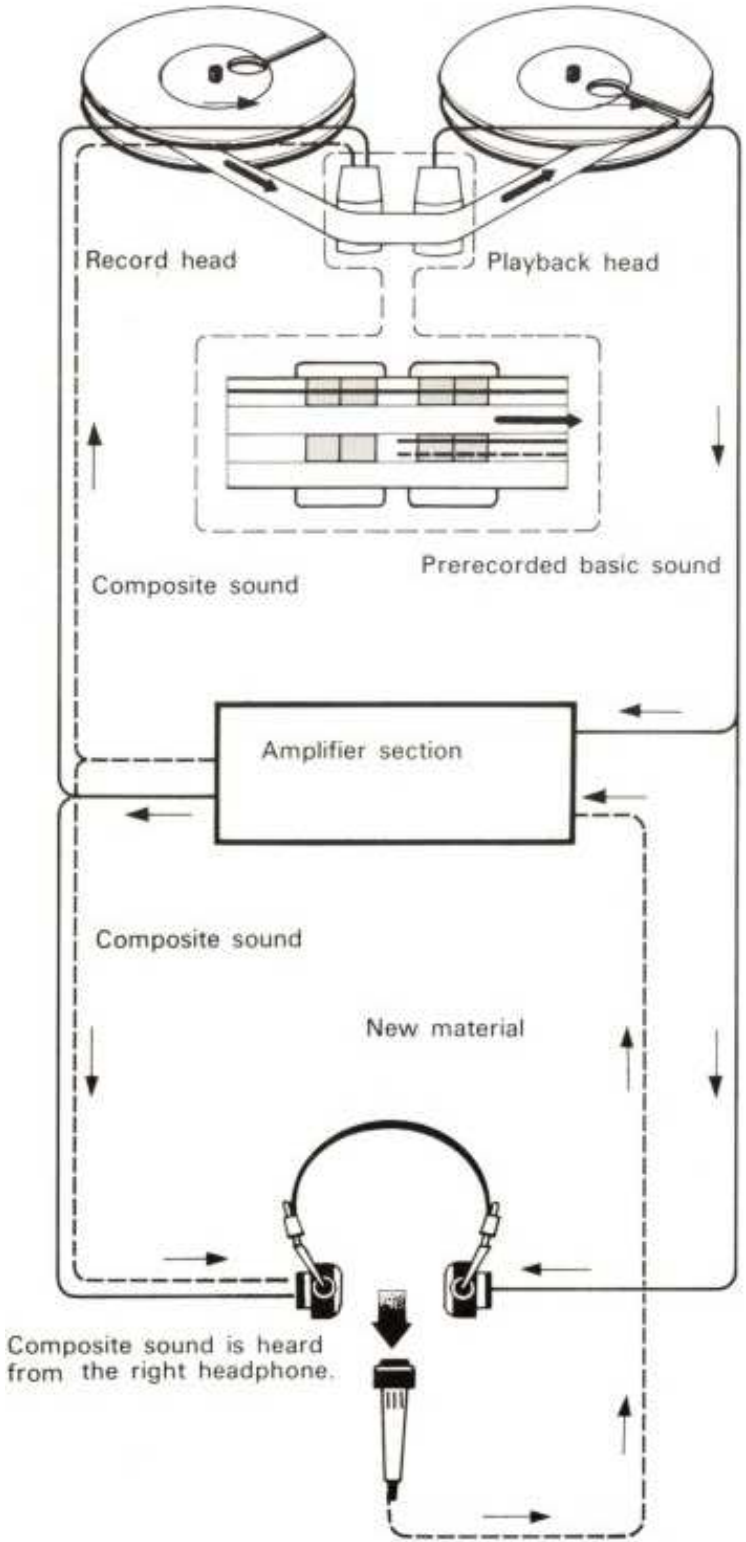
The Model TC-377 can make composite recording from the left channel to the right channel and vice versa.
This enables you to record a duet with your favorite singer or other special effects.

Sound-on-sound recording on the right channel [L→R]

1. Record the basic program on the track-1 of the left channel according to "MONOPHONIC RECORDING" on page 7 and rewind the tape to the beginning.
2. Connect the L LINE OUTput and R LINE INput by using the supplied Connecting Cord RK-74.
   - Be sure to use the plugs of the same color at both ends of the connecting cord.
3. Insert a microphone into the R MICROPHONE input.
4. Insert a stereo headphone into the HEADPHONE output for monitoring.
5. Set the L MONITOR switch to TAPE and the R MONITOR switch to SOURCE.
6. Adjust the recording level after setting the MIC-L and LINE-L Record volume controls to MIN.
   (1) Play back the tape and adjust the level of the signal through the R LINE INput by using the LINE-R Record volume control and right LEVEL meter.
   (2) Rewind the tape to the beginning.
   (3) Adjust the level of the signal through R MICROPHONE input by using the MIC-R Record volume control and right LEVEL meter.
7. While depressing the R RECORD lever, set the Function selector to ▶ (FWD) and start recording with the microphone. Through the left headphone, the playback of basic recording on the track-1 of the left channel is heard; through the right headphone, the composite recording is heard.
   The composite signal will be recorded on track 3 of the right channel.
8. When the recording is finished, rewind the tape to the beginning and play back track-3.
   - Be sure to set the R MONITOR switch to TAPE and L MONITOR switch to SOURCE for playback of track-3.

Sound-on-sound recording on the left channel [R→L]

Connect the R LINE OUTput and L LINE INput by using the supplied Connecting Cord RK-74.
Other recording procedure is the same as described above except for the channel used in each step.



Echo Recording

The Model TC-377 can make more resonant recordings either stereophonically or monophonically.

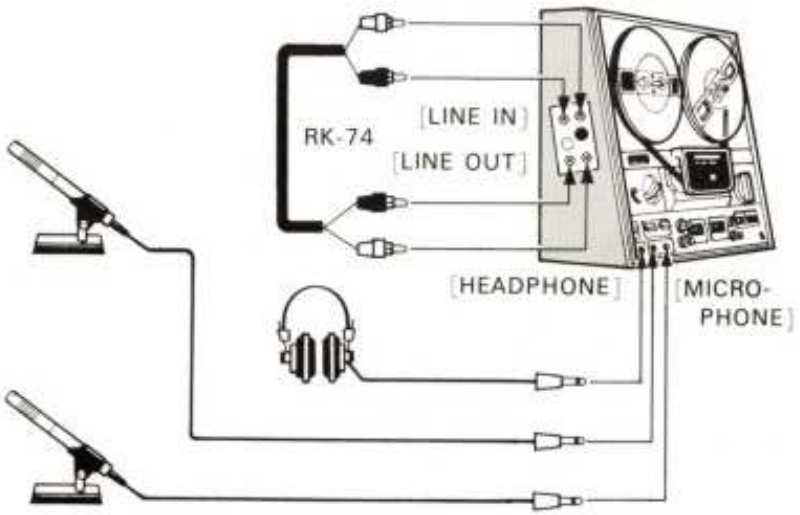
Stereo echo recording

1. Insert two high performance microphones into the MICROPHONE inputs.
2. Turn the LINE-L and LINE-R Record volume controls and Line output LEVEL ADJUST knob fully counterclockwise. And connect the LINE INputs and LINE OUTputs by using the supplied Connecting Cord RK-74.
3. Insert a stereo headphone into the HEADPHONE output.
4. Set the MONITOR switches to TAPE.
5. While depressing the RECORD levers, set the Function selector to ▶ (FWD) and start recording.
6. While listening through the headphone, adjust the microphone input levels by turning MIC-L and MIC-R Record volume controls. Then, slowly turn the LINE-L and LINE-R Record volume controls clockwise to properly echo microphone input source.
   - Be careful not to excessively increase the record volume. Otherwise oscillation may occur with rumbling sound.
7. Rewind the tape to the beginning.

Now, the echo recording preparation is complete. Start a formal recording. In this case, disconnect the stereo headphone. Use of the stereo headphone may disturb your tempo because of the time-lag of the program source through the headphone.

Monophonic echo recording

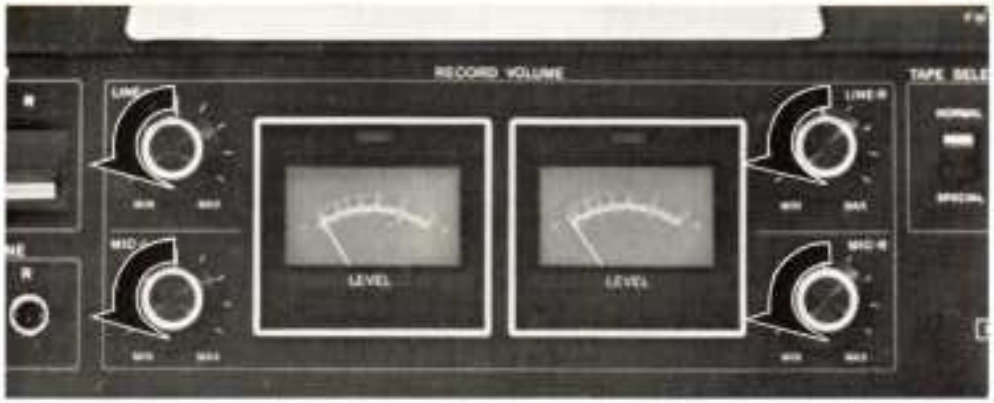
Recording procedure is almost the same as described above except for the use of one microphone.



ERASING TAPE

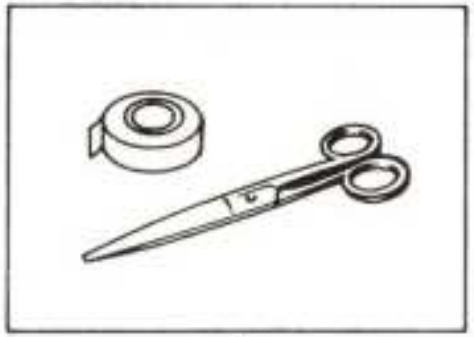
The erase head operates in record mode. Therefore, every time a recording is made, any previous recording on the tape is automatically erased. A tape can also be erased without adding a new recording as follows:

1. Thread the tape to be erased.
2. Disconnect any input source from the recorder, and turn all Record volume controls fully counterclockwise.
3. Set the recorder in record mode. Now the tape is being erased. Tape speed of 7½ ips is recommended.
   - For fast erasure, use a bulk eraser.



SPLICING TAPE

1. Use splicing tape and a pair of scissors.
   - Do not use ordinary cellophane tape as it tends to deteriorate recording tapes.
   - Also avoid using magnetized scissors or razor blades. Magnetized instruments will cause a "click" or "pop" at the splice during playback.
2. Neatly overlap the tapes to be spliced and cut diagonally at the position of the splice.
3. Place a piece of splicing tape on a flat surface. Then place the two diagonal tape ends together on the splicing tape, shiny side down. Be careful to make ends meet but not overlap.
4. Trim off the excess splicing tape.



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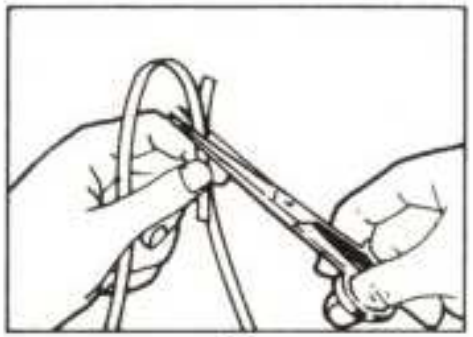

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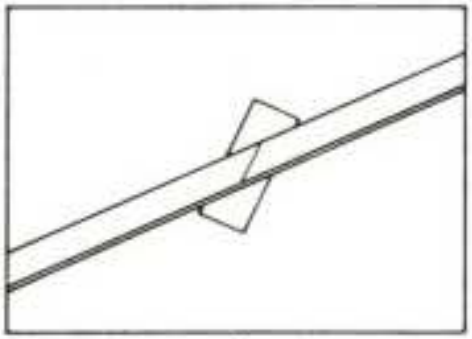

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MAINTENANCE

Cleaning Heads and Tape Path

Dirty heads and tape path will cause :

- Loss of high frequency response which results in poor sound quality
- Loss of sound volume in recording and playback
- Drop-out
- Unsatisfactory results in tape erasing
- Increase of wow and flutter

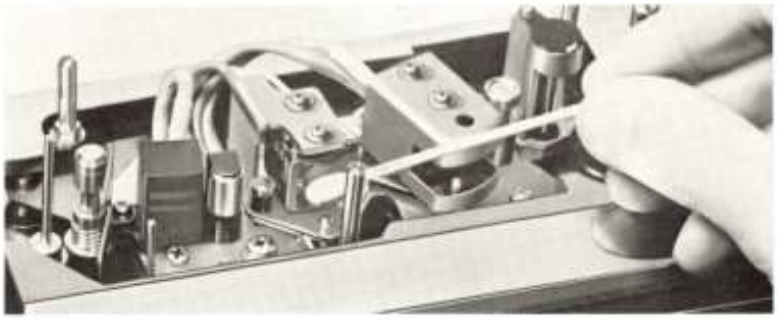
Therefore, the mirror-like finish on the face of all heads and tape path must be preserved to get optimum performance. Generally cleaning heads after every 8 hours will be sufficient. But it is recommended to clean the heads and tape path carefully before starting a valuable recording.

1. Remove the head cover by pulling it up.
2. Take the supplied head cleaning tip or a soft cloth and carefully wipe the heads and other surfaces upon which the tape travels.

If the deposits are hard to remove, moisten the tip or the cloth with a head cleaning solution or denatured alcohol and repeat cleaning.

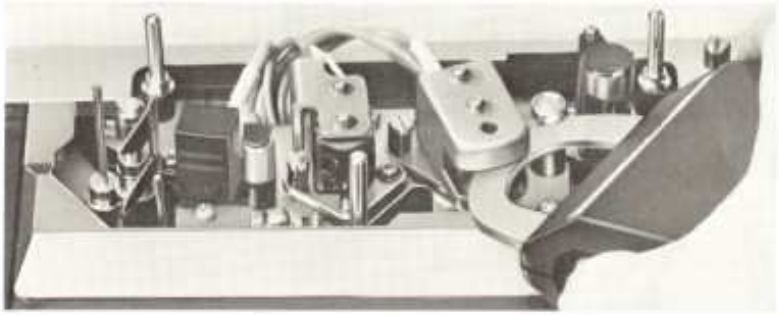
For easier access to the pinch roller, push back the wire lever of the automatic shut-off mechanism and fix it there with a string, and then set the Function selector to ▶ (FWD) ; for easier access to the capstan, set the selector to ▶▶ (FF).

- Remember to remove string when cleaning is completed.
- Do not allow metallic materials near the heads.
- Discard the tip or cloth after use to prevent contamination of the cleaning solution or alcohol remaining in the container.



Demagnetizing Heads

Continuous use, or the accidental touch, of a piece of magnetized steel (screwdriver, scissors, etc.) will magnetize the heads, causing an increase in tape noise. It is recommended that the heads be demagnetized periodically to maintain optimum performance. The SONY Head Demagnetizer HE-2 (optional) is recommended.



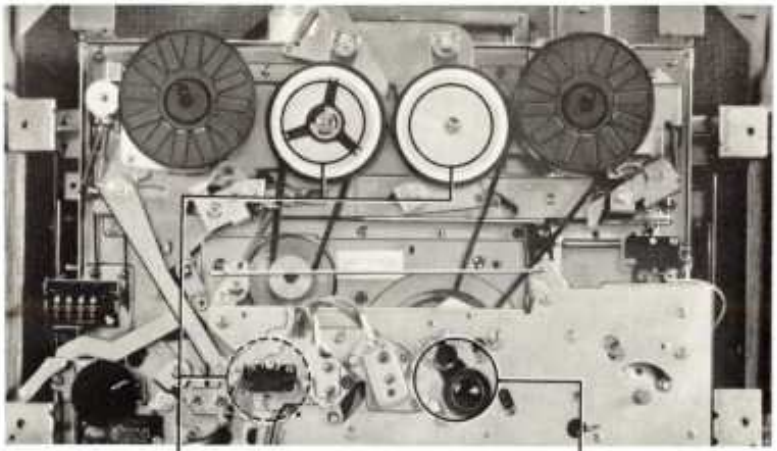
Cleaning Cabinet

Clean the cabinet with a soft cloth and mild detergent.
Do not use solvents such as alcohol, benzine or thinner as they could mar the finish of the recorder.

Lubrication

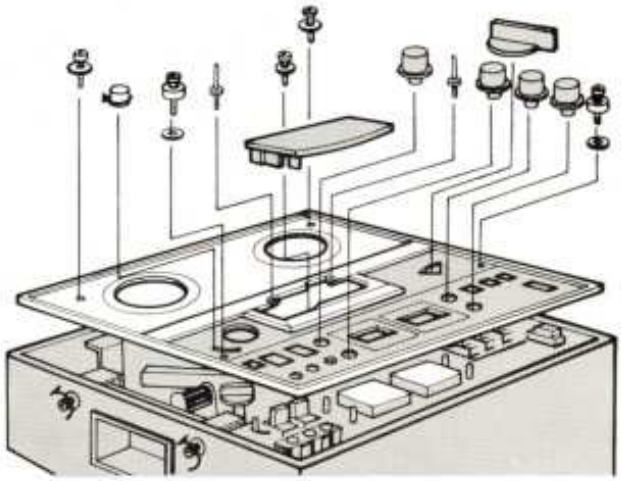
To maintain the optimum performance of the recorder, lubrication is required every 6 months.
Consult your nearest SONY dealer for lubrication of your recorder. Use light machine oil and lubricate the capstan, pinch roller shaft and idler shafts. Avoid excessive lubrication. It will cause slippage of the mechanism and contamination of your tape.
Make sure all excess oil is wiped off completely. Remove the top panel and take out the cap of pinch roller. Lubricate the pinch roller shaft, capstan, and idler shafts with 1 drop each of light machine oil.

- Before removing the top panel, disconnect the AC power cord.



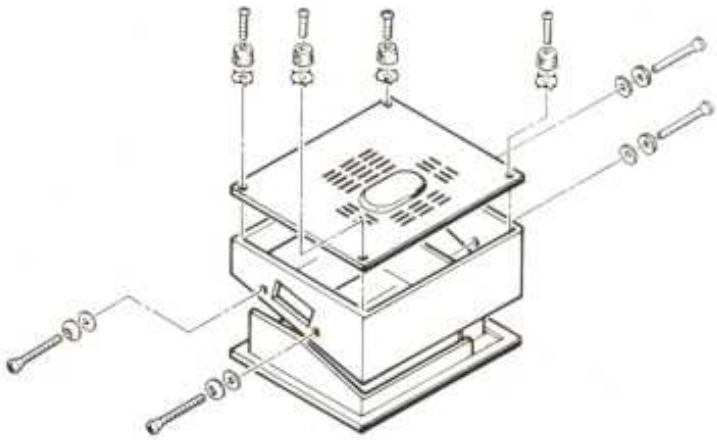
How to Remove the Top Panel

Pull out the head cover, Function selector and four Record volume controls. To remove the pause lever, turn the lever clockwise. Remove the four screws of the top panel and three screws under the head cover. Loosen the four large screws on both sides of the case.



For Horizontal Use

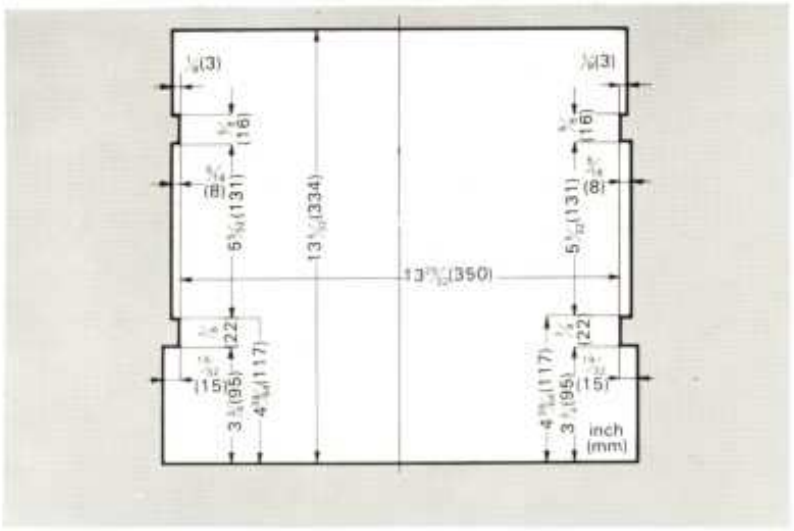
1. Turn the set front-side down.
   Put spacers beneath the set to avoid direct contact of take-up and supply reel spindles, head cover, etc. with the table surface.
2. Remove the wooden case by loosening the four large screws on both sides of the case.
3. Reverse and replace the wooden case.
4. After tightening the four large screws on both sides, place the set with top panel up and check whether or not the set is properly fixed.
   If readjustment is necessary, turn the set front-side down and loosen the four screws located at the encircled parts (refer to the photo below). The set can be moved slightly.
5. Replace the bottom panel and the four rubber bases.

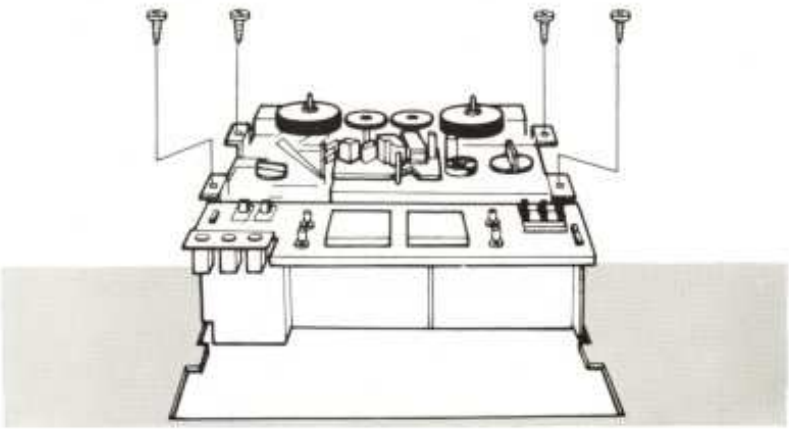


Mounting

This recorder can be set in either vertical or horizontal position. Consult your nearest SONY dealer to mount the recorder in the following procedures:

1. Make a rectangular cutout at the desired location on the panel or the cabinet in accordance with the measurement.
2. Unscrew the four large screws on both sides of the case, and remove the case from the set.
   - Before removing the case from the set, disconnect the AC power cord.
3. Take out the top panel as described in "How to Remove the Top Panel".
4. Mount the set in a new location and fasten with four wood screws as illustrated.
5. Place the top panel on top of the set and replace the parts and controls on it.





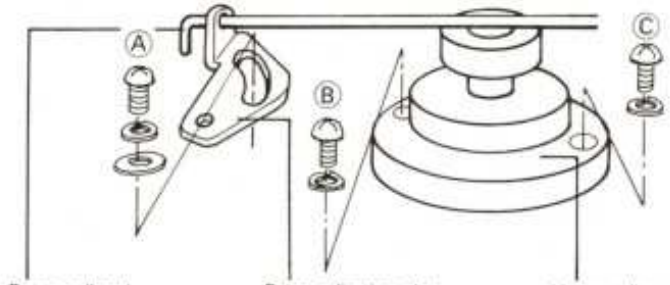
Frequency Adaptation

The operating frequency of the model TC-377 can be set to either 50 Hz or 60 Hz.
Consult your SONY dealer to change the line frequency in the following procedures:

To change Motor pulley

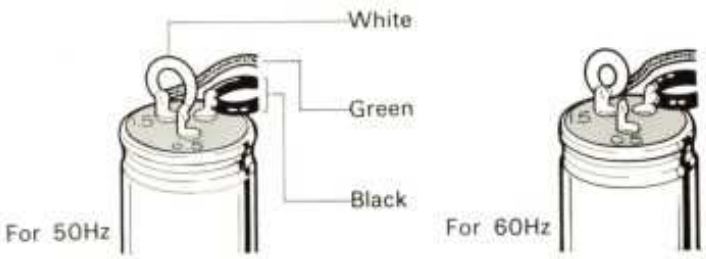
Disconnect the AC power cord and remove the top panel as described in "How to Remove the Top Panel" on page 12. The Motor pulley is located near the center of the drive mechanism.

1. Remove the pause adjusting plate by loosening the screw Ⓐ. Withdraw the Pause pull rod.
2. Remove the rubber belt from the Motor pulley and idler wheel.
3. Remove the Motor pulley by loosening the two screws Ⓑ and Ⓒ which hold the Motor pulley.
4. Substitute the supplied Motor pulley in place of the original and tighten the screws.
5. Thread the rubber belt on the Motor pulley and idler wheel.
6. Adjust the screw Ⓐ so that the clearance between the Pinch roller and Capstan is approx. 1 mm when pulling the Pause lever in forward mode.
   The Pause lever is not locked when pulling in stop, fast forward, and rewind modes.



To change tapping of the motor capacitor terminals

The motor capacitor is located at the upper side of the drive mechanism. Change the tapping of the motor capacitor terminals by soldering as illustrated.



SPECIFICATIONS

Power requirements:	AC 120V (100V, 110V, 127V, 220V, 240V; adjustable by the authorized SONY personnel), 50/60 Hz
Power consumption:	28W
Tape speed:	7½ ips, 3¾ ips, 1⅞ ips (19 cm/s, 9.5 cm/s, 4.8 cm/s)
Recording time:	1.5 hours total at 7½ ips, stereo recording with 1,800 ft (550m) tape
Reels:	7″ (18 cm) or smaller
Semiconductors:	23 transistors, 5 diodes
Recording system:	4 track stereo or monaural
Heads:	Record head .....1 Playback head .....1 Erase head.....1
Singal-to-noise ratio:	55 dB (with SLH tape) 52 dB (with standard tape)
Distortion:	1.2%
Frequency response:	standard tape: 20–25,000 Hz; 30–20,000 Hz ±3 dB; 30–17,000 Hz; 30–9,000 Hz at 1⅞ ips SONY SLH tape: 20–30,000 Hz at 7½ ips; 30–25,000 Hz ±3 dB at 7½ ips; 30–20,000 Hz at 3¾ ips
Wow and flutter:	0.09% at 7½ ips 0.12% at 3¾ ips 0.17% at 1⅞ ips
Inputs:	Microphone inputs.....2 Sensitivity −72 dB (0.2 mV) Accepts low impedance microphones Line inputs.....2 Sensitivity −22 dB (0.06V) Impedance 100 kΩ
Outputs:	Line outputs.....2 Output level 0 dB (0.775V) at load impedance of 100 kΩ Load impedance more than 10 kΩ Headphone output .....1 Accepts an 8-ohm stereo headphone
Record/Playback connector:	Input impedance 3.8 kΩ Output impedance 3.3 kΩ
Dimensions:	16½ (w)×8⅜ (h)×15⅞ (d)″ (418×210×392 mm)
Weight:	24 lb 4 oz (11.0 kg)
Supplied accessories:	Reel .....1 Connecting Cord RK-74 ...2 Head cleaning tips.....1 set Motor pulley.....1
Optional accessories:	Electret Condenser Microphone ECM-19B, ECM-21 Stereo Headphone DR-4A, DR-5A Head Demagnetizer HE-2

Design and specifications subject to change without notice.

SONY tape for best recording

GUIDE FOR CHECKING TROUBLES

If trouble with the TC-377 arises, make the following simple tests to determine whether or not the trouble requires a professional engineer's skill. If the trouble persists after you have made these tests, consult your nearest SONY dealer for further instructions.

TROUBLE	PROBABLE CAUSES	WHAT TO DO ABOUT IT
Function selector cannot be locked	• Automatic shut-off mechanism is activated.	• Take up the slack of tape. • The selector cannot be locked without threading tape.
No (or less) sound from recorded tape	• Monitor switch set in SOURCE. • Break in connection to speakers or in connecting cord from recorder to amplifier. • Amplifier fault or volume control turned off. • Line output level adjust knob set in MIN.	• See that all controls are in proper positions. • Check connections. • Play commercially prerecorded tape to see if the fault is in record or playback circuit. • Turn the Line output level adjust knob to MAX.
Slippage of tape; wow or flutter	• Dirty or oily capstan and pinch roller. • Warped reel. • Different size reels for supply and take-up. • Uneven pinch roller.	• Clean capstan, pinch roller and other tape path components. • Replace the warped reel • Check pinch roller for perfect roundness.
Recording cannot be made	• Input connections are not proper or break in the connecting cord. • Amplifier fault. • Record levers not locked • Dirty record head	• Check input connections and cords. • Check Level meters to see that signal is reaching recorder. • See that all controls are correct. • Clean the record head. (Refer to pege 11)
Low hum on tape	• Input (record player or tuner) or recorder not properly grounded. • Recorder operating in electrical field.	• Check whether hum occurs on prerecorded tapes as well as those made on the recorder. • Check ground terminal connections of input or recorder. • Try reversing the AC power cord of the recorder in the wall outlet.
Loss of high frequencies	• Dirty heads. • Tape threaded improperly (shiny side contacts the heads) • Tape twisted or damaged.	• Clean heads and tape path. (Refer to page 11) • Thread tape properly. • Check the tape.
Unsatisfactory erasing	• Dirty erase head.	• Clean the erase head. (Refer to page 11)

SQ RECORDING

The new Stereo/Quadraphonic record system (SQ), introduced from SONY and CBS, is a matrix 4-channel system which allows 4 channels of sound to be reproduced from any SQ records or to be broadcast through FM-multiplex radio system.
Your Model TC-377 uses mirror-smooth F&F heads and assures precise tape-to-head contact. These advantages make your recorder more suitable for SQ recording than any other tape recorder.
The Model TC-377 can record matrix-encoded 4-channel programs (such as SQ records) on track 1 and 3 or tracks 4 and 2...just the same as a conventional stereo recording.
For playback, the Model TC-377 can reproduce 4 distinct channels of sound with your present stereo system plus a SONY SQ decoder and additional audio equipment.

Additional audio equipment necessary for 4-channel reproduction

Decoder	Amplifier	Speaker
SQA-200 (built-in amplifier)	No need	2 (for back)
SQD-1000	1 (for back)	2 (for back)

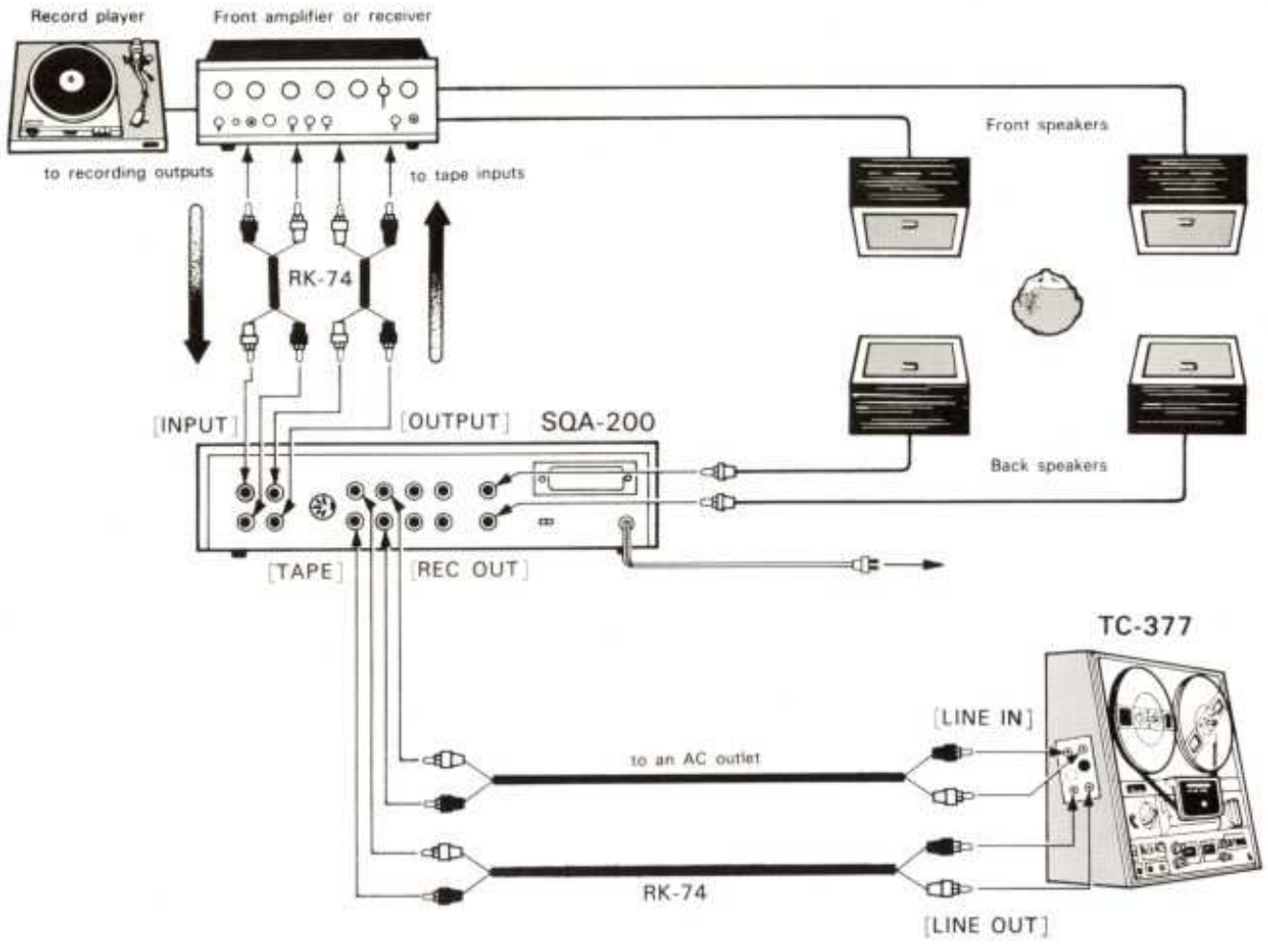
For more infromation on SQ system, refer to the instruction manual of either SQA-200 or SQD-1000.

UNI-PHASE

"UNI-PHASE" is a new SONY development which allows a SONY two channel stereo tape recorder to record and reproduce matrix-encoded sound. Units bearing the UNI-PHASE symbol employ SONY's precision-molded F&F (Ferrite and Ferrite) heads to maintain accurate phasing and thus assure perfect recording and playback of any SQ or regular matrix discs.

F&F (Ferrite & Ferrite) Heads

SONY high performance F&F heads feature: (1) greatly extended frequency response and remarkable reduction of high frequency losses, (2) higher reliability...1/200 the wear of a conventional head, (3) highly polished, mirror-smooth surface contact with the tape, and many more.
The symbol F&F means the core material plus the guard portion of the heads are all ferrite. This prevents uneven head wear and maintains a precisely parallel head gap for a more extended period.



SONY CORPORATION

INDUCTORS

LETTER SYMBOL	DESCRIPTION
L101, 201	BUZZ
L102, 103, 202, 203	EQUALIZATION
L104, 204	TRAP
L301, 401	FILTER
L501, 502	DUMMY
L503, 504	BIAS FILTER

SWITCHES

LETTER SYMBOL	DESCRIPTION	POSITION
S101-1~5	EQUALIZATION	19 cm/s
S102-1~6	TAPE SELECT	NORMAL
S103-1~2	MONITOR L	TAPE
S104-1~2	MONITOR R	TAPE
S105-1~5	REC/PB L	PB
S106-1~5	REC/PB R	PB
S107	MUTING	OFF
S108	BIAS	FWD
S109	POWER	OFF
S110	AUTO SHUT OFF	OFF
S111-1~2	MIC ATT	OFF

TRANSISTORS

LETTER SYMBOL	DESCRIPTION
Q101, 201	2SC631A
Q102, 202	2SC631A
Q103, 203	2SC631A
Q104, 204	2SC634A
Q301, 401	2SC631A
Q302, 402	2SC631A
Q303, 403	2SC633A
Q304, 404	2SC634A
Q305, 405	2SC634A
Q501, 502	2SC634A
Q601	2SD291
Q602	2SC634A
Q603	2SC633A

TRANSFORMERS

LETTER SYMBOL	DESCRIPTION
T301, 401	HEADPHONE
T501	BIAS OSC
T701	POWER