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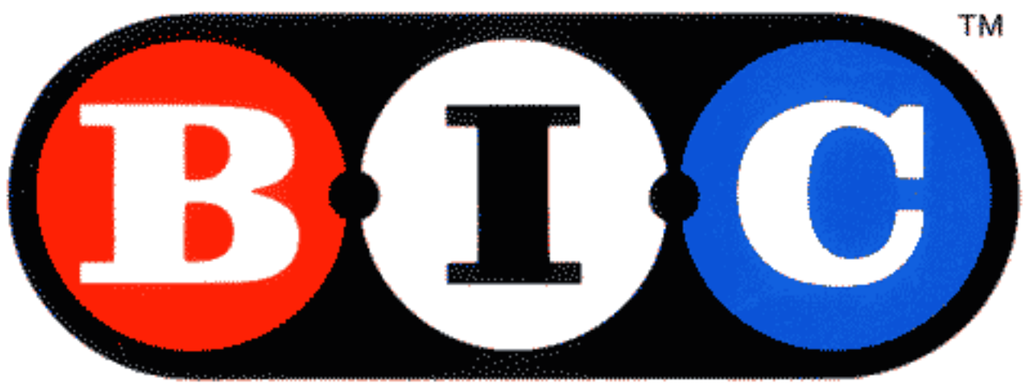
B·I·C Two Speed Cassette Deck | Model T-3

Owner's Manual



IMPORTANT INFORMATION

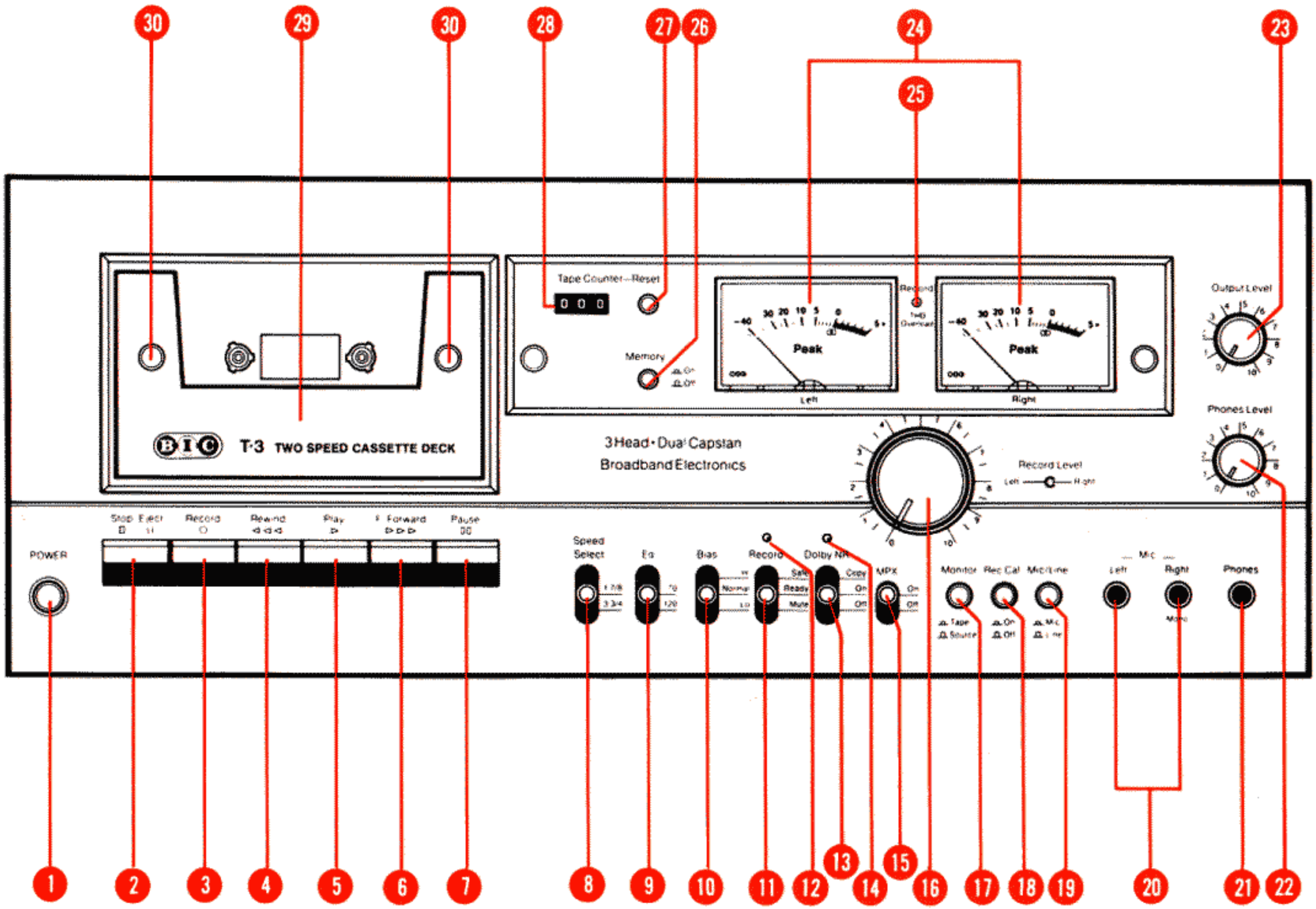
Your B•I•C Two-Speed Cassette Deck is a high performance instrument. To insure the best possible performance, we strongly suggest that you use ONLY the highest quality tape cassettes available.

C-120 Cassettes
Tape manufacturers are able to extend playing time in C-120's by using a thin tape, with a thinner coating of magnetic oxide. Because of this, and in light of the B•I•C deck's high speed wind/rewind, there is a possibility of damage to the cassette tape. Furthermore, recordings made on C-120 cassettes yield fidelity that is poorer in terms of frequency response, noise, distortion, and dynamic range. We therefore recommend that you do not use C-120 cassettes.

Recording
The suggested record levels in this manual are meant as a guide only. An optimum recording is one which yields the best possible frequency and noise characteristics without exceeding an acceptable level of distortion. There is no hard and fast rule to achieve this optimum point. It can only be judged by you, the listener. Listen, trust your ears, and in a short time you will be turning out high quality recordings with very little effort.

We will take you through the connection and operation of the T-3, step by step. Let's begin with a look at your unit...

Warning: To prevent fire or shock hazard, do not expose this appliance to rain or moisture.


30
29
30
28
27
26
24
25
23
Tape Counter—Reset
Memory
Peak
Peak
Left
Right
Output Level
Phones Level
BIC T-3 TWO SPEED CASSETTE DECK
3 Head • Dual Capstan
Broadband Electronics
Record Level
Left
Right
Stop Eject
Record
Rewind
Play
Forward
Pause
POWER
Speed Select
Eq
Bias
Record
Dolby NR
MPX
Monitor
Rec Cal
Mic/Line
Mic
Left
Right
Phones
Mono
1
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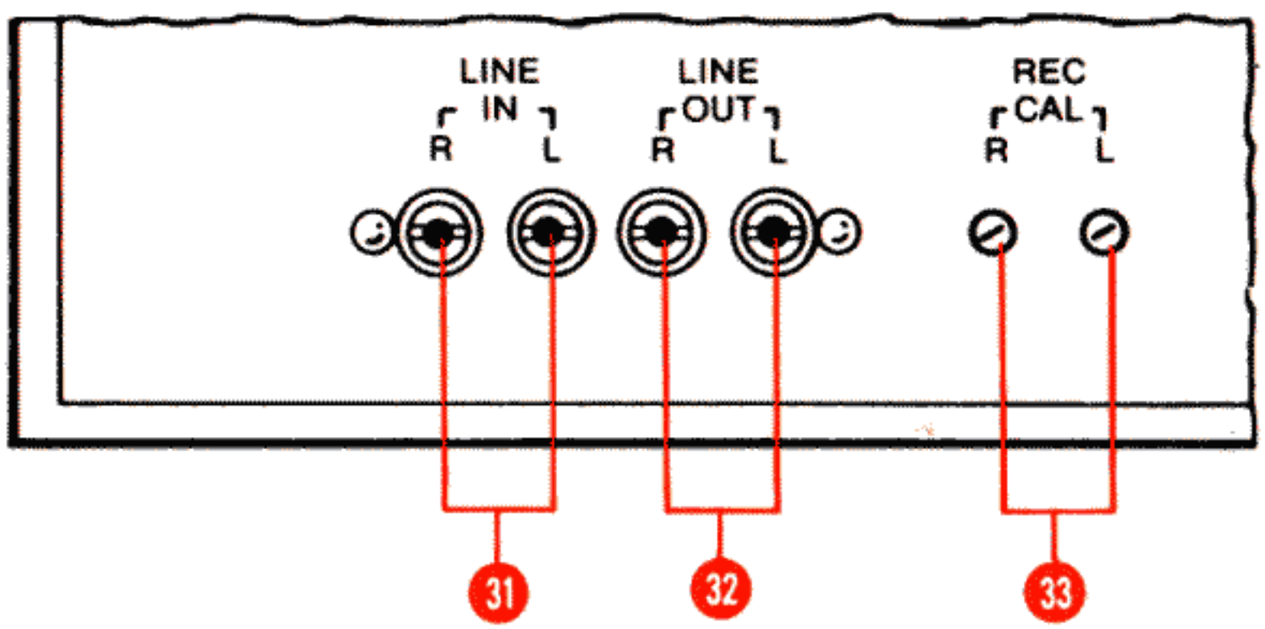

LINE IN
R
L
LINE OUT
R
L
REC CAL
R
L
31
32
33

Rear Panel

Features of the B·I·C Two-Speed Cassette Deck | T-3

This is a quick reference guide only. Refer to text for detailed explanation of features listed.

1. **Power Button**
   Depress to turn unit On/Off.
2. **Stop/Eject Key (□ ⏏)**
   Depress, tape motion stops. Depress again, door opens for insertion or removal of cassette.
3. **Record Key (○)**
   To record, depress with PLAY KEY (5).
4. **Rewind Key (◁◁◁)**
   Depress to activate rewind.
5. **Play Key (▷)**
   Depress to activate playback.
6. **Fast Forward Key (▷▷▷)**
   Depress to activate fast forward.
7. **Pause Key (▯▯)**
   Depress to stop tape motion. The unit will remain in the play or record mode. Press again to resume. Pause will not function in FF or REW.
8. **Speed Select Switch**
   Provides selection of 1⅞ ips (4.75 cm/s) or 3¾ ips (9.5 cm/s) operation.
9. **Equalization Switch (Eq.)**
   The EQ SWITCH allows for the optimization of record and playback equalization. It must be properly set for both record and playback functions. See chart on page 7.
10. **Bias Switch**
    The bias switch provides optimum record bias for various tape formulations. Need be set in record mode only. See chart on page 6.
11. **Record Switch**
    Three position switch: Safe, Ready, Mute. Eliminates possibility of accidental erasure, and allows muting of undesired information during recording (e.g. record groove lead-in noise).
12. **Record Switch Indicator**
    LED glows RED when switch is in ready or mute position and deck is recording. LED blinks RED in these two positions when deck is not in record mode.
13. **DolbyNR***
    Three position switch: Dolby Copy (decode only), Dolby On, Dolby Off.
14. **Dolby Indicator**
    LED glows green when Dolby Circuit(s) on.
15. **Multiplex Switch (MPX)**
    Two position switch: MPX on, MPX off.
16. **Record Level**
    Clutched to allow simultaneous adjustment of both (L & R) channels.
17. **Monitor Button**
    Button is in to hear tape recording, out to hear source material.
18. **Record Calibration Button (Rec. Cal.)**
    A 400 Hz Dolby calibration tone is generated when button is in.
19. **MIC/Line Button (Input Selection)**
    To record from Tuner, Phono, Aux., etc., button is out (Line). To record using microphone(s), push button in (Mic).
20. **MIC Jacks**
    For mono use Right only, for Stereo use both.
21. **Phone Jack**
    Plug in stereo headphones for private listening.
22. **Phones Level**
    Separate volume level control for headphones.
23. **Output Level**
    Enables matching of decks' output level to the systems' other signal sources (does not affect record level).
24. **Record Level Meters**
    Two extended range peak indicating meters allow accurate adjustment of record levels. Also used for Dolby Record Calibration (18 & 33), and decoding of Dolby FM broadcasts.
25. **Record/THD Overload Indicator**
    LED glows GREEN when deck is in record mode. LED changes to RED as recording levels begin to approach 3% total harmonic distortion.
26. **Memory**
    Allows return to pre-set point on tape. Use in connection with tape counter and counter reset (27 & 28).
27. **Counter Reset**
    Restores counter to "000" position.
28. **Tape Counter**
    Provides a convenient method of locating tape sections.
29. **Cassette Door**
    Press STOP/EJECT KEY (2) to open door. Cassette may then be inserted or removed.
30. **Cassette Door Cover Screws**
    Allow removal of cover for routine cleaning and demagnetization.

REAR PANEL

31. **Line in Jacks (Record)**
    Two RCA jacks for Right and Left channels.
32. **Line Out Jacks (Playback)**
    Two RCA jacks for Right and Left channels.
33. **Record Calibration Pots (Rec. Cal.)**
    Allows precise user adjustment of Right and Left channel Dolby Record Calibration.
34. **AC Line Cord (not shown)**
    120 Volts, 50/60 Hz.

* Noise reduction system manufactured under license from Dolby Laboratories

'Dolby' and the double-D symbol are trade marks of Dolby Laboratories

We at B•I•C wish to take this opportunity to thank you for purchasing the Model T-3 Two-Speed Cassette Deck. Because of its unique features, we suggest that you read all of the instructions carefully. This will insure that you obtain the best possible performance.

Contents

Installation/Connection

AC Line

We recommend that you connect the AC cord only to the UNSWITCHED outlet of your receiver/amplifier or directly to a wall socket. (Fig. A)

CAUTION: Never leave the cassette deck in the record or play mode with the AC power off. To do so leaves the pinch rollers engaged which will lead to gradual degradation of wow and flutter.

Audio Cables

Two stereo audio cables are supplied with your cassette deck. The cable ends are color coded (red & black) RCA type connectors to facilitate proper right and left channel connections. It is a good practice to always use red for right and black for left. This will avoid any future confusion.

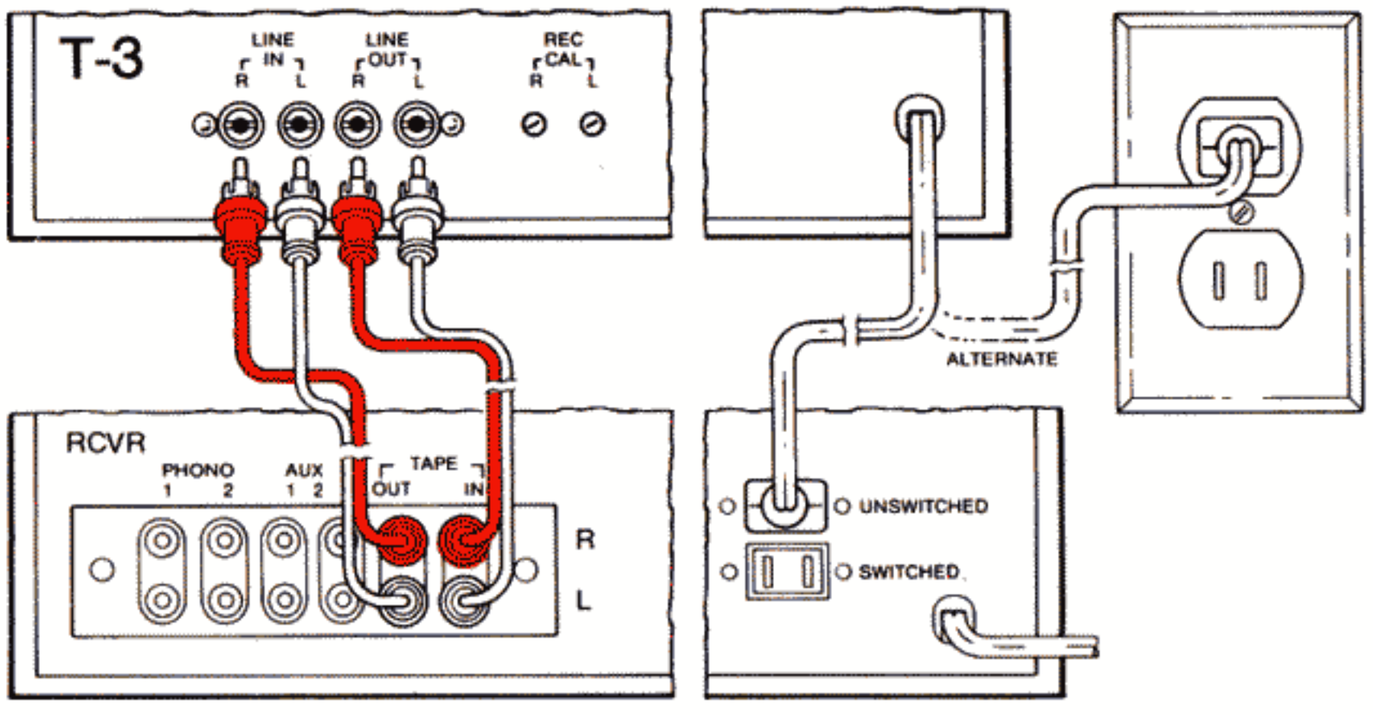
Playback Connections

Connect one set of cables from the T-3's LINE OUT jacks (32) to your receiver/amplifier jacks labelled TAPE IN, TAPE MONITOR or PLAYBACK. If these jacks are not available, you may use the AUXILIARY INPUTS (AUX). Connect left to left (black) and right to right (red). (Fig. A)

Record Connections

In a similar manner, connect the second set of cables from the T-3's LINE IN jacks (31) to the jacks on your receiver/amplifier labelled TAPE OUT or REC. OUT. (Fig. A)

Fig. A



BEFORE OPERATING

Erasure

When you are making a recording, material previously recorded is automatically erased. Only the new recording will remain.

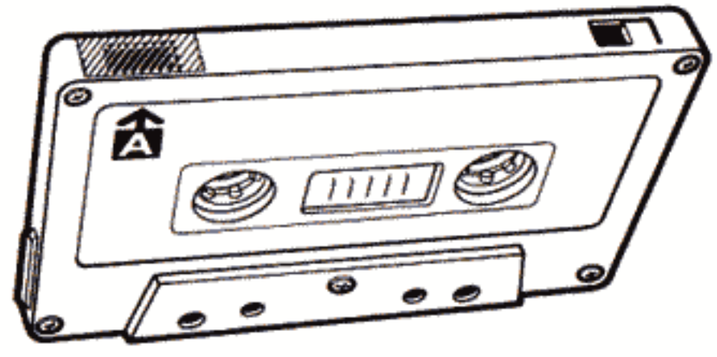
To erase an existing recording without making a new one, record in a normal manner with the RECORD LEVEL control (16) fully counterclockwise. This erases previous material, leaving a blank tape.

A much faster and better method is to use a high quality bulk tape eraser. Follow the manufacturers' instructions for use.

Safeguards Against Accidental Erasure

To insure that a recording is not accidentally erased, break out the small tab(s) in the rear of the cassette with a small screwdriver or similar tool. When looking at the side you wish to safeguard, the corresponding tab is to the upper left. With the tab(s) broken out, you will not be able to place the deck in the record mode (Fig. B). If you should wish to re-record on a cassette whose tab(s) have been removed, cover the corresponding

Fig. B



Operation

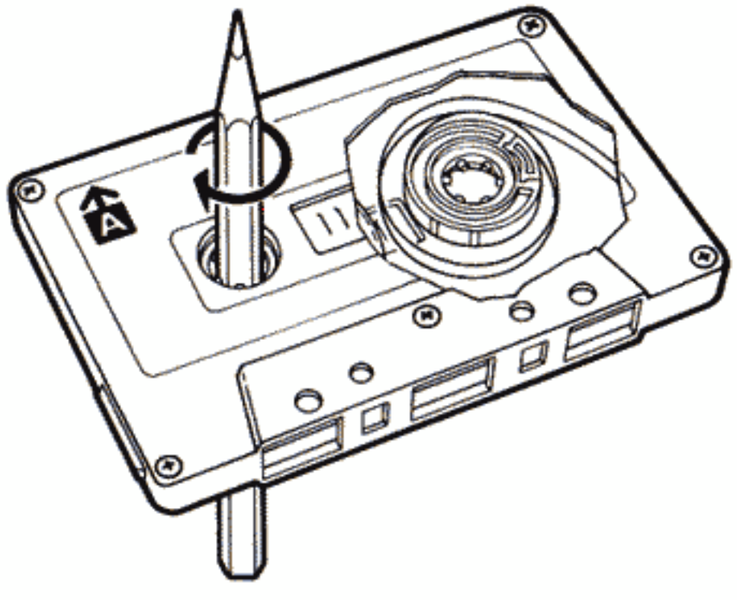
slot(s) with a quality masking tape and record in the usual manner. To avoid fouling the cassette and deck parts with adhesive, remove the masking tape immediately after recording. Some accessory manufacturers supply plug-in replacement tab(s) which may also be used for this purpose.

The T-3 provides another safeguard against accidental erasure and recording. If the RECORD SWITCH (11) is in the "Safe" position, recording and/or erasure will not take place even though the transport can be placed in the record mode.

Prevention of Tape Binding

Before inserting a cassette in the deck, be certain that the tape is not loose or looped in the cassette housing. If it is, a pencil or similar object may be used to take up any tape slack. (Fig. C)

Fig. C



General

The steps below are common to playback and recording. Further instructions are given under the appropriate section.

a. Press the POWER BUTTON (1) to turn unit on.

b. Press STOP/EJECT key (2). Cassette door (29) will open.

c. Insert cassette with the tape facing downwards so that the tape will come in contact with the heads. (Fig. D)

d. Close door.

NOTE: When the cassette has been stored for a period of time, it is a good practice to run it through FAST FORWARD (6) and then REWIND (4). This will eliminate any static charge or sticking of the tape. The T-3 will perform this operation considerably faster than most other cassette decks.

e. Press RESET button (27) to restore TAPE COUNTER (28) to "000" position.

f. Set the EQ SWITCH (9) for the tape formulation you are using. It is only necessary to set BIAS (10) when you are recording. (See chart on pg. 7)

g. Select the tape speed (8). As of this writing, all commercially prerecorded cassettes are recorded and should be played back at 1⅞ ips. You may record at either speed.

NOTE: If the SPEED SELECT SWITCH (8) is changed while the deck is operating the transport will automatically disengage.

h. If you are recording or playing back a tape with the "Dolby" process, set the DOLBY NR switch (13) to "On". To record or play a tape without the Dolby process the switch should be set to "Off" (Commercially recorded tapes will be marked DOLBY SYSTEM®).

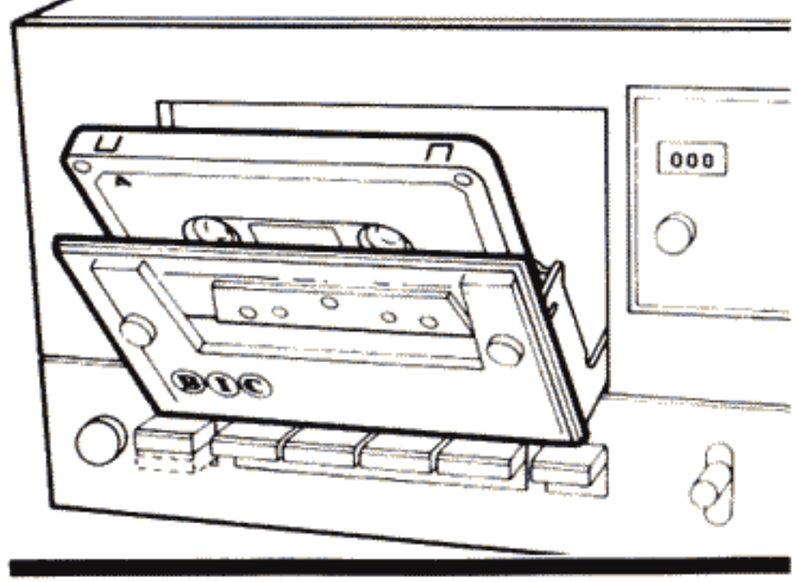
i. You may temporarily interrupt recording or playback at any time by pressing the PAUSE key (7).

j. Auto Shut Off—when the tape ends drive will automatically stop. All keys will disengage. When the PAUSE key is engaged and the deck is in the Play or Record mode, Auto Shut Off will not function.

Memory

This function allows you to automatically return to a pre-set point on the tape. It works in conjunction with the "000" setting on the tape counter, and operates in both record and play. To use this function, select the point on the tape you wish to return to. Press the RESET BUTTON (21) to reset the counter to "000", and set the MEMORY button (26) to "On". To return to this pre-selected point, press STOP (2), and

Fig. D



then REWIND (4). The deck will automatically stop and disengage just ahead of the pre-set point. The COUNTER (28) will read "999".

Playback

NOTE: If you have connected the T-3 to the TAPE IN, TAPE MONITOR, or PLAYBACK jacks on your receiver/amplifier, the receiver/amplifiers' "Tape monitor" switch must be set to "Tape" in order to play the deck through your speaker system. This is not necessary if you are listening through the T-3's headphone jack.

1. Refer to steps (a) through (j) under OPERATION.
2. Set the RECORD SWITCH (11) to "Safe". With the switch in this position, the record key can be engaged but no recording can be made.
3. Set the MULTIPLEX SWITCH (15) to "Off".
4. Depress the MONITOR button (17) ("Tape" position).
5. Depress the PLAY key (5) to begin playback.

NOTE: Always make sure that you have selected the proper EQ position.

The OUTPUT LEVEL Control (23) may be used to match the T-3's output level to the level of your system's tuner or phono section. This will avoid level changes when switching between the systems' different program sources. If you do not wish to do this, the control may be used as a secondary volume control augmenting the one on your receiver.

Dolby Record Calibration (REC. CAL.)

NOTE: For practical purposes it is not necessary to perform Record Calibration adjustments every time you change tape. If you adjust for any high quality tape, there will only be a slight variation (typically no more than ± 2dB) when using another quality tape. Most ears would not detect this very slight difference. Therefore, performance of this adjustment procedure once for the tape you most often use would be sufficient. This simple procedure is performed as follows:

1. Depress the STOP/EJECT key (2), insert a blank cassette and close door.
2. Select either speed.
3. Select the proper Bias and EQ setting (10) (9) for the tape you are using.
4. Set RECORD switch (12) to "Ready".
5. Set MONITOR button (17) to "Tape".
6. Set REC. CAL. button (18) to "On".
7. Place deck in record mode by depressing RECORD (3) and PLAY (5) keys.
8. Using a small slotted screwdriver turn the right REC. CAL. SCREW (30) on the rear panel until the right channel METER POINTER (24) is centered at the Dolby Trademark ("0" on meter scale). Repeat for left channel. (See Fig. F. Pg. 6) A slight wavering of the needles is normal.
9. Set REC. CAL. button (18) to "Off".
10. Press STOP/EJECT key (2).

Recording

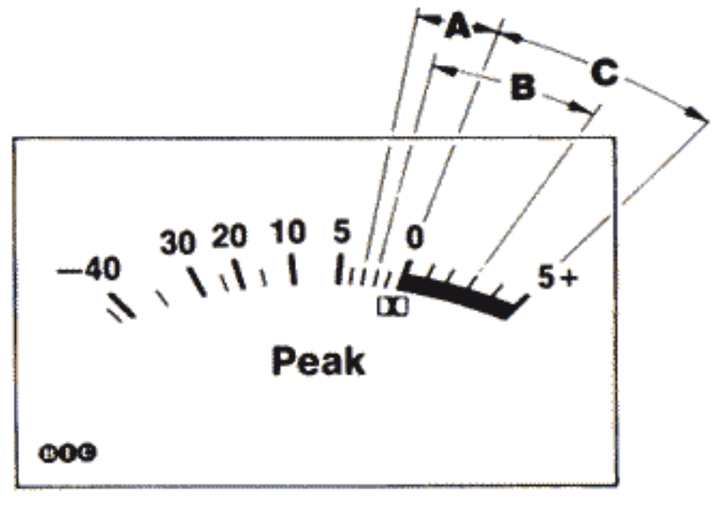
1. Refer to steps (a) through (j) under OPERATION.
2. To record from your receiver/amplifier, set the MIC/LINE button (19) to the "Line" position. Set to the "Mic." position for microphone use.
3. Set the DOLBY NR SWITCH (13) as follows:

a. If you do not wish to employ the Dolby NR process, set the switch to "Off".

b. If you wish to record utilizing the Dolby NR process and you are recording from tuner, phono, a tape that has not previously been Dolby encoded, or from microphones; set the switch to the "On" position.

c. If you are copying a Dolby encoded tape or a Dolby encoded FM broadcast, set the switch to "Copy". This is a *decode only* position.

Fig.E **Suggested Record Levels**
A (−3 to 0db) = Synthesizer, Electronic
B (−2 to +3db) = Pop
C (0 to +5db) = Classical



NOTE: When the Dolby Circuit is in the "On" or "Copy" position, the DOLBY INDICATOR (14) above the switch glows green.
4. If you are recording FM, and your tuner DOES NOT effectively suppress high-frequency leakage, the MULTIPLEX SWITCH (19) must be set to the "On" position. If you are recording from any other program source, or from a tuner that DOES effectively suppress this leakage (and most quality modern tuners do), set the switch to "Off".
5. Set the RECORD SWITCH (11) to "Ready". The LED above the switch will blink red.
6. Depress the PAUSE key (4).
7. Depress the RECORD key (3) with the PLAY key (5). The RECORD INDICATOR (25) will glow green.
8. Select the source you wish to record (FM, Phono, etc.) on your receiver/amplifier.
9. Set the MONITOR button (17) to "Source".
10. Record levels must now be set with the RECORD LEVEL Control (16).
NOTE: Recording at 3¾ ips allows a higher signal level to be placed on the tape. The levels suggested in Fig. E left are meant as a guide only. We advise experimenting when recording at either speed.
11. Release the PAUSE key (4). Recording will begin. To monitor recording, set the MONITOR button (17) to "Tape".
12. To avoid recording unwanted signals without stopping tape motion, hold the RECORD SWITCH (11) in the "Mute" position. This will erase prior information and record a quiet passage. This is useful for eliminating record lead-in groove noise, undesired announcements on FM, etc. The switch automatically returns to the "Ready" position when released.
13. When finished recording, press the STOP/EJECT key (7). All keys will disengage.

NOTES ON RECORDING

Monitoring/Three Head Operation

Because the T-3 is a three-head machine and utilizes separate record and playback heads (contained in one housing); you have the ability to listen to, or "Monitor" the recording an instant after it is made. At any time you wish to do this, simply depress the MONITOR button (17) ("Tape" position). This gives you an instant, audible check on the quality of the recording, and is an excellent method of adjusting record levels. Four separate Dolby circuits allow you to monitor a decoded signal.

There is another important benefit of three-head operation. Ideally, a record head should have a wide gap, and a playback head should have a narrow gap. Two-head machines must compromise gap width.

Record/THD Overload Indicator 25

The LED will glow green as soon as the T-3 is placed in the record mode. This is a two-color LED and will change to red as peak distortion levels approach 3%. An LED is capable of responding much faster than a meter. It will, therefore, occasionally indicate red when the meters are giving no indication of high record levels. Such peaks can usually be ignored because they are of so short a duration that the ear would not detect them. In most cases you will find that the best recordings are obtained when the record level is set so that the highest peaks in the music cause the LED to glow red and the meters to indicate somewhere between +3 and +5. This is especially true when recording at the higher 3¾ ips speed. Higher speed recording makes this additional "head room" possible.

Tape Speeds

All B•I•C cassette decks provide two tape speeds: 1⅞ ips and 3¾ ips. They have been designed to provide excellent performance at the standard 1⅞ ips speed, but by the nature of the physical laws governing the science of tape recording, an increase in tape speed must yield even better results. For this reason, use the 3¾ ips whenever the very highest fidelity is required.

While the 1⅞ ips speed will suffice for FM broadcasts and most records, the higher speed will really be appreciated for program material that taxes the capability of slow speed tape recording.

In addition to being a "copy" machine, the tape recorder is a creative tool. The higher speed will be especially useful should you choose to become involved in live recording. A pair of good quality microphones, some blank tape, and

perhaps a pair of headphones are all that you need to get started. Live recording is art as well as science, so a good deal of practice will be required. Your audio salesman will be happy to assist you in the choice of suitable microphones.

Decoding FM Dolby Broadcasts with the T-3

An increasing number of FM stations are broadcasting Dolby encoded signals. The T-3 gives you the ability to decode these signals without the need for a separate Dolby unit.

NOTE: Dolby FM is broadcast with 25 μsec. de-emphasis rather than the standard 75 μsec. de-emphasis. If your receiver or tuner is not equipped with a switch to select between 25 and 75 μsec. de-emphasis, an adapter box is available for this purpose. This inexpensive accessory is available at most hi-fi stores. Follow the hook-up instructions supplied with the device. The receiver or accessory device should always be set to "25 μsec." when decoding FM broadcasts.

ADJUSTMENT PROCEDURE

Dolby FM stations broadcast a Dolby Reference Tone several times a day. If you do not know the times of these broadcasts, the station will be able to tell you.

Just before the tone is broadcast:

a. Insert cassette in the T-3. Place in the Record mode and depress the Pause key.

b. Set Dolby NR switch to "copy".

When the reference tone is broadcast:

c. Adjust the Record Level Control so that meter pointers are centered at the Dolby Trademark ("0" on meter scales), and make note of the required setting for future use (Fig. F).

OPERATION PROCEDURE

Once you have the proper Record Level Control setting, the following simple procedure can be used whenever you wish to listen to a Dolby encoded station:

a. Insert a cassette in the T-3. Place it in the Record mode and depress Pause.

b. Set the Dolby NR switch to "Copy".

c. Set the Record Level Control to the position you previously noted.

d. Set Tape Monitor button (11) to "Source".

e. Tune to the desired station and set the Tape Monitor switch on your receiver or amplifier to "Tape".

Dolby NR System

During recording, the Dolby System automatically increases the record level of quiet passages just prior to laying the signal on the tape. When this "Dolby encoded" recording is played back, the increased signal levels are correspondingly decreased, bringing these passages back to their original level. What makes Dolby work is that the tape noise is reduced at the same time. Thus, during quiet passages, tape noise is significantly reduced.

Dolby is a dual process: encode and decode. Previously encoded material should not be re-encoded. This is one of the functions of the "Copy" position. It permits you to monitor a *decoded* signal without further encoding.

Bias and Equalization

These two parameters are adjustable on your B·I·C cassette deck and provide maximum performance from a large variety of tapes. The following chart (Fig. G) lists many of the more popular quality tapes available today, along with their EQ and Bias settings.

Low quality tapes are not recommended because they may jam or shed coating during operation.

Fig. F

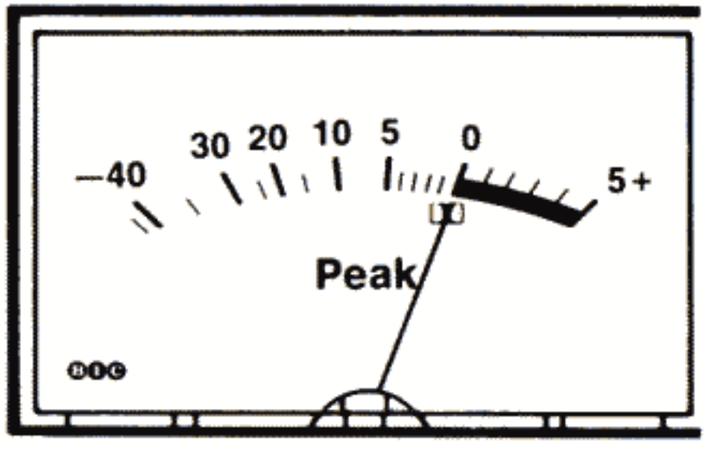


Fig. G

TAPE	EQ	BIAS 1⅞	BIAS 3¾
TDK SA MAXELL UD-XLII SCOTCH MASTER II AMPEX GRAND MASTER II FUJI FX-II All other Chrome	70 μsec	High	High
TDK AD MAXELL UD-XLI All other Low Noise	120 μsec	Normal	
All Ferrichrome	70 μsec		

Because EQUALIZATION is used for both Record AND Playback, the EQ switch must be set to the proper position whenever the cassette deck is used.

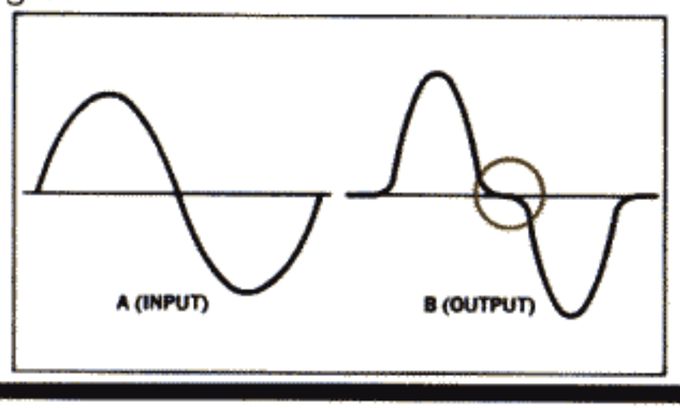
Bias

If you recorded a music signal by itself, it would sound distorted during playback because the particles imbedded in the tape do not respond linearly to magnetization. If you applied a perfect sine-wave signal in this manner (Fig. H, A), the recorded magnetization patterns would resemble the distorted shape (Fig. H, B). To overcome this effect, all magnetic tapes must be magnetized to their linear magnetization region by means of a high frequency signal known as bias. While the bias signal is too high in frequency to actually be recorded on the tape, its presence lowers the distortion of the desired audio signal. Because there are many different cassette tape formulations, it is necessary to provide different amounts of bias for different tape formulations.

Generally speaking, as you increase bias, output increases and distortion decreases—up to a point. If too much bias is applied, higher frequencies will once again be attenuated. They will in effect, be erased by the high levels of applied bias.

By decreasing bias you may achieve very extended frequency response, but if it is too low distortion will increase rapidly. To avoid this distortion you would have to lower record levels. Doing that would lead to decreased S/N ratio and decreased available dynamic range.

Fig. H



Equalization (EQ)

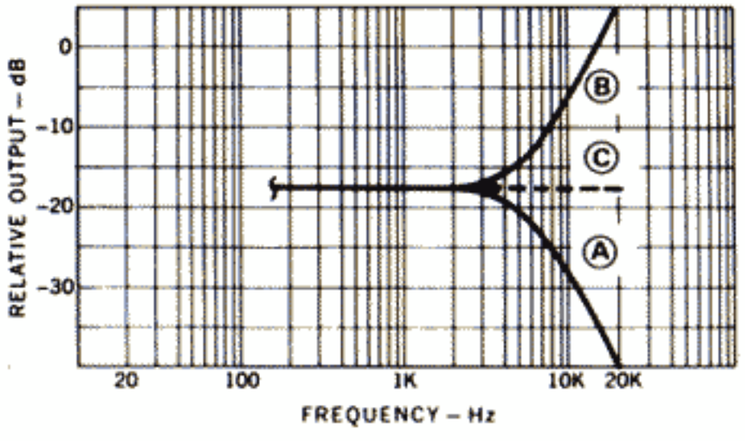
EQ is a boosting or attenuating of certain frequencies during the recording process.

The boosting compensates for the tendency of a tape head to roll off the higher recorded frequencies (Fig. I). Curve "A" illustrates the rolled-off response of the playback head. If we were to boost the high frequencies during the record process (Curve "B"), then playback would theoretically yield a net "flat" response (Curve "C"). This seems like a simple method to improve high frequency response but other factors are involved. While the designer is free to apply whatever EQ is necessary during the recording process, PLAYBACK EQ is standardized for each tape formulation and tape speed. If a designer does not follow these standards he may realize performance advantages, but tapes made on his decks will not play back properly on other machines. In a like manner, tapes made on other decks will play back improperly on his machine.

If too much high frequency boost is introduced during the record process, tape saturation, high frequency loss, and distortion occur. As with underbiasing, this situation again leads to a deterioration of S/N ratio and dynamic range.

In summary: slow speed cassettes cause earlier roll-off of high frequencies. Compensating for this with a narrower playback head gap causes output to approach the residual tape noise level. Applying exaggerated amounts of corrective EQ during recording pushes the recorded levels of high frequencies towards tape saturation, causing high frequency roll-off. Insufficient bias leads to increased distortion. Both situations require a reduction in record levels. Reducing levels improves high frequency response, but brings overall recorded levels closer to the "noise threshold", thereby reducing available dynamic range, and once again degrading the S/N ratio. It is this inherent interplay of recording parameters that must be clearly understood by the recordist.

Fig. I



Routine Maintenance

Since certain tapes are more sensitive to high frequencies than others, two standards have been set for cassette playback at 1⅞ ips: 120 microseconds (μsec.)(a boost-beginning at 1,326 Hz) for normal iron-oxide tape, and 70 μsec. (beginning at 2,274 Hz) for "chrome type" tapes. The 70 μsec. EQ is advantageous because it boosts fewer high frequencies and, therefore, less accompanying tape hiss (about 4.5dB less noise). At 3¾ ips, EQ is reduced even more for better performance. The higher speed also allows increased Bias for further gains. The T-3 makes these adjustments automatically when you change speed.

To maintain the high performance of your T-3, periodic cleaning and demagnetizing is necessary. Many problems such as wow and flutter and high frequency loss are traceable to residue build-up and head magnetization. We strongly urge a routine maintenance schedule. Clean heads and tape path frequently, and demagnetize every 20 hours of use.

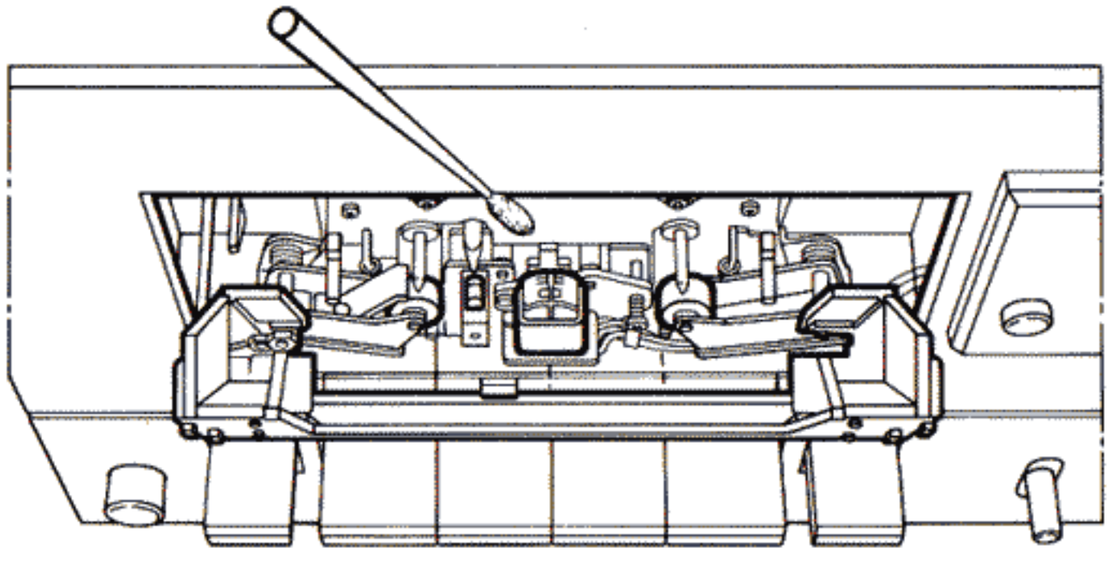
Cleaning and Demagnetizing

A. Close the cassette door (29) and remove the two thumb screws (30) which hold the cover in place. The cover will come off, allowing access to the tape heads, pinch rollers and capstans.

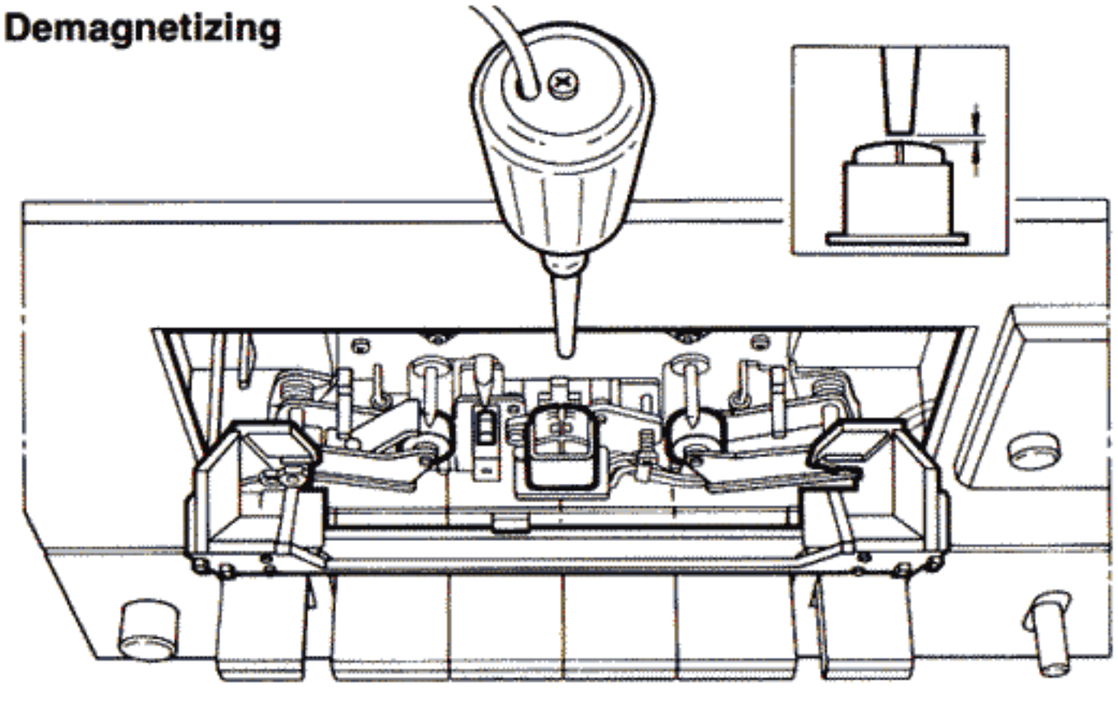
B. **CLEANING** – Use a cotton swab moistened with methyl alcohol (Do Not Saturate) and clean all elements that touch the tape. Clean the pinch rollers, capstans, and heads thoroughly. Use a gentle scrubbing action. DO NOT USE ANY METAL OBJECT to clean the tape heads. They are fragile. Use methyl alcohol *only*. Other solvents may cause damage.

C. **DEMAGNETIZING** – Magnetic build-up deteriorates the signal to noise ratio and high frequency response. Therefore, it is necessary to demagnetize all metallic parts close to the tape, including the heads. Any good demagnetizer may be used and the manufacturers' instructions should be followed. Avoid touching any metal part of the deck with the demagnetizer.

Cleaning



Demagnetizing



Trouble Shooting

SYMPTOM	POSSIBLE CAUSE
No Power	AC cord unplugged. Plugged in switched outlet and receiver / amplifier not on.
No Record or Play	Heads require cleaning. Audio cables incorrectly installed.
No Sound	T-3 Monitor button set to "Source" when playing tape. REC. CAL. button "On" Tape Monitor Switch on Receiver "Off".
No Record	Record switch in "Safe" position.
Cannot Depress Record Key	Cassette has safety tabs removed.
No Erase	Heads require cleaning.
One Channel Out	Defective or unplugged cables. Cables incorrectly installed.
Does Not Remain in Record or Play Mode	Cassette binding. (Try another tape cassette.) Tape looped within cassette. End of tape has activated auto-stop. (Rewind or turn over.)
Tape Does Not Move	Tape cassette defective. (Try another.) Tape cassette incorrectly loaded.
Distorted Sound	Record/Play heads require cleaning Record/Play heads require demagnetizing. Record levels adjusted too high. Defective tape cassette.
Noisy (poor S/N ratio)	Record levels adjusted too low. Heads require cleaning. Defective or poor quality tape cassette. Bias or Eq. improperly set.
Excessive Wow/Flutter	Capstans and pinch rollers require cleaning. Defective tape cassette (replace).

NOTE: Many problems are caused by the attempted use of low cost promotional tape cassettes. USE ONLY high quality name brand cassettes.

SPECIFICATIONS

Speeds
1⅞ ips (4.75 cm/s)
3¾ ips (9.50 cm/s)

Overall Frequency Response (70μsec)
1⅞ 25-19,000 Hz±3 dB
3¾ 25-22,000 Hz±3 dB

Record/Play Signal-to-Noise Ratio ("A" Weighted, Reference 3% THD, 70 μsec)
Dolby NR 1⅞ 63 dB
1⅞ 55 dB
Dolby NR 3¾ 67 dB
3¾ 58 dB

Wow and Flutter (%)

WRMS	1⅞	.05	DIN 45507	1⅞	.10
	3¾	.035		3¾	.09

Total Harmonic Distortion (0 VU, 70 μsec) (%)
1⅞ 1.8
3¾ 1.5

Fast Forward and Rewind Time
Approximately 48 seconds (C-60)

Meter Type and Range
Peak indicating −40 to +5dB

Drive System
Two Speed Tachometer Feedback DC Servo Motor
Dual Capstan Transport

Output
2.0 VRMS into 10KΩ – Line
.7 VRMS into 100Ω – Headphones

Input
200 mV for 0 VU Indication – Line
8-600Ω – Mic

Power Requirements
105-135 Volts AC, 50/60 Hz

Power Consumption
Less than 35 Watts

Dimensions
17-15/16" W x 6-7/16" H x 10 1/8" D

Weight
14.8 lbs.

B·I·C | AVNET ☐ Westbury, New York 11590 U.S.A.