

### 2.3 TRANSPORT CONTROLS and INDICATORS (continued....)

#### MOTION CONTROL [H]

This lever allows the tape to be shuttled across the heads in the STOP mode, a feature useful for search and cue operations. By moving the MOTION CONTROL to the right or left of center, the tape can be moved in a corresponding direction at a rate of speed proportional to the angle of the control. When released, the MOTION CONTROL lever returns to center and the tape comes to a stop. If another transport mode is initiated while the motion control is in use, it becomes inoperative and the new mode is initiated when the tape motion stops.

### 2.4 THE STANDBY MODE

During normal use, the reel tension system is always active while the recorder is stopped. In this condition, referred to as the STANDBY mode, the reel motors rather than the brakes are holding the reels from turning. The operator can, with any combination of different size reels, "rock" the tape with one hand without any slack or spillage.

To make this active STANDBY condition possible, the transport control computer must adjust the reel motor standby torque according to the size and amount of tape on each reel, information which can only be derived after a given amount of reel rotation has occurred. Therefore, when the LJ-12 is first switched on, the reel motors remain off and the brakes must hold the reels until enough reel rotation is sensed for the transport control computer to calculate the reel size.

During this period, the recorder will operate normally and will respond to all commands except the motion control, which also requires the reel size information to operate properly. Once the necessary reel rotation occurs, either by entering a PLAY or FAST mode or by manually turning the reels, the brakes will release and the recorder will enter the standby mode. Usually, the small amount of reel rotation that occurs while the tape is being threaded is sufficient, and the operator will notice a slight decrease in drag as the brakes release and the reel motors take over before the threading operation is complete. If the recorder is switched on with the tape already threaded, a gentle turn of the take-up reel will also release the brakes, but it is not necessary to do this unless it is desirable to use the motion control before any other function.

### 2.3 TRANSPORT CONTROLS and INDICATORS (continued....)

#### TAPE COUNTER DISPLAY

Three tape counter functions are controlled through the use of the HOME and REPLAY pushbuttons [J] located to the left of the tape counter LED display.

HOME - Shuttles the tape to the zero position and STOPS.

REPLAY - Returns the tape to the ZERO position and begins playback.

RESET - Depressing the HOME and REPLAY buttons simultaneously resets the tape counter display to zero.

#### CAPSTAN SPEED CONTROLS [G]

^ SPEED UP - Raises the capstan speed to the next highest standard fixed speed. If the speed is already 30 IPS this push-button alone does nothing. Depressing ^ (speed up) while holding the VARI push-button will increase the capstan speed continuously in .01 IPS increments.

v SPEED DOWN - Lowers the capstan speed to the next lowest standard fixed speed. If the speed is already 3.75 IPS, this push-button alone does nothing. Depressing v (speed down) while holding the VARI push-button will cause the speed to decrease continuously in .01 IPS increments.

DISPLAY MODE - The Display Mode push-button, located to the left of the capstan speed display[M], changes the display to the PERCENT mode. The display will now indicate percent of deviation from the most recent standard fixed speed in use. To return to the IPS display, press the MODE button again.

#### VARI PUSH-BUTTON [I]

In addition to selecting the VARI-SPEED mode for the SPEED-UP and SPEED-DOWN pushbuttons, the VARI button also effects other controls to allow the following special functions:

REVERSE PLAY - Is selected by holding the VARI push-button and depressing PLAY. Since recording is not possible in reverse, activating reverse play while in the RECORD mode will cancel recording.

FORWARD WIND - By holding VARI and depressing the FAST-FORWARD button, a slow-wind spooling mode is selected which winds the tape at approximately 125 IPS for improved packing and safer tape storage.

REVERSE WIND - Depressing REWIND while holding the VARI button selects the reverse slow-wind mode.

**2.3 TRANSPORT CONTROLS and INDICATORS (continued....)**

The table below defines each of the transport controls, indicators, and components, as illustrated in Figure 2-2. Each component is identified by a letter of the alphabet, which appears in brackets [ ].

**TABLE 2.1 TRANSPORT COMPONENTS**

[A] Supply Reel	[L] Edit Push-button
[B] Flutter Arm	[M] Capstan L.E.D Display
[C] Counter Wheel	[N] Basic Deck Controls
[D] Dummy Head	[O] Record Push-button
[E] Manual Lifter Defeat	[P] Take-up Reel
[F] Erase Head	[Q] Tape Break Idler
[G] Capstan Speed Controls	[R] Tape Break Sensor
[H] Motion Control	[S] Pressure Roller
[I] Vari Push-button	[T] Capstan Shaft
[J] Tape Counter Controls	[U] Play Head
[K] Tape Counter Display	[V] Record Head

## 2.5 AUDIO CONTROLS and INDICATORS

Refer to Figure 2-3, The Audio Control Panel, for the following discussion of the audio controls and their function.

REPRODUCE LEVEL - These controls set the level of the line output if the UNCAL mode is selected for the appropriate channel.

RECORD LEVEL - These controls set the level to the record amplifiers when the corresponding channel is in the UNCAL mode.

RECORD UNCAL LED - Indicates that the record level potentiometer controls the record level instead of the internal record CAL setting. Push the RECORD UNCAL button to toggle the cal status.

SAFE/READY BUTTONS - These pushbuttons effect the record-enable status of each channel. Select the READY mode for those channels intended to begin recording when the RECORD push-button is depressed. The SAFE mode prevents the selected channel from entering the RECORD mode. If recording is already in progress, pressing SAFE stops recording on the corresponding channel.

RECORD INDICATORS - These large red LEDs illuminate when the corresponding channel is in the RECORD mode.

INPUT PUSHBUTTONS - Selecting the INPUT mode switches the line input to the output for monitoring.

SYNC/OUTPUT BUTTONS - Signals from the reproduce heads are directed to the output when the OUTPUT mode is selected. The SYNC mode selects the record head as the source of audio output. A channel in the SYNC mode will automatically switch to INPUT if recording is initiated.

MONITOR CONTROLS - The outer knob selects which channels are to be monitored at the headphone jack or speaker. The center knob adjusts the monitor volume. A terminal strip for speaker connections can be found on the back side of the Audio Control Panel P.C. board, directly behind the monitor controls.

VU METERS - The level of the audio signal at the line output is indicated on these meters, which are switchable to read 0 VU at line levels of 0, +4, +6, and +8 dBM (see "VU Meter Sensitivity").

PEAK LEDS - These indicators, found to the right of each VU meter, respond to audio peaks above a pre-set level, normally +3 VU. See the "Peak LED Adjustment" section for details on adjusting the PEAK LED response threshold.

## 2.6 THE CALIBRATION CONTROLS

Inside the LJ-12 Audio Electronics Chassis, programmable digital attenuator pads replace the countless trim-pots found in conventional analog tape recorders. The values loaded into these control elements by the Audio Control Processor determine such characteristics as CAL levels, equalization, record bias, input reference level, and fast mute level. As controlled by the Audio electronics computer are de- and pre-emphasis, input and sync switching, and erase current gating.

Audio alignment of the recorder is performed by adjusting the values stored in the non-volatile (permanent) memory of the Audio Control Processor. This is done via the *Calibration control* section of the audio control panel (see Figure 2-3). A step-by-step calibration procedure can be found in the Audio Electronics Chapter titled "*Using the Calibration Controls*".

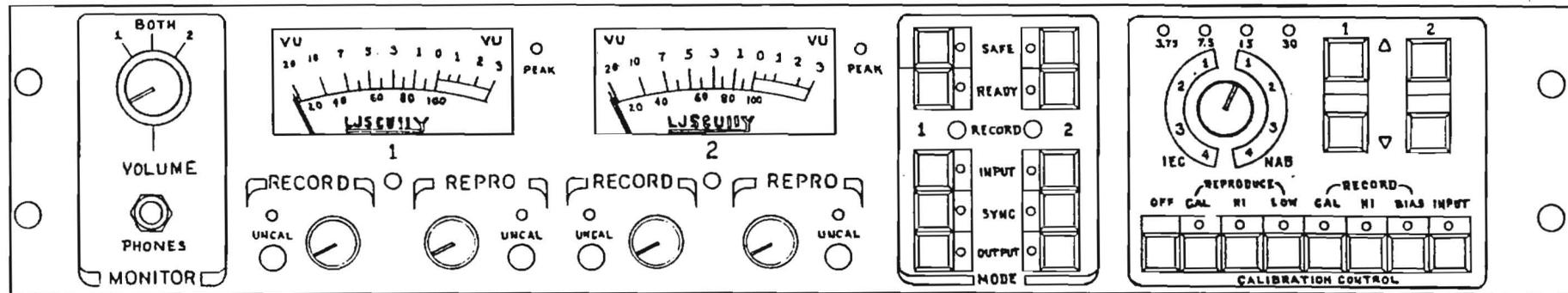
EQUALIZATION SELECTOR - This 8-position rotary switch selects either NAB or IEC de- and pre-emphasis standards, and activates one of the four calibration memories available for each standard. Calibration values programmed while this switch is in a given position will be recalled when the same memory position is selected again.

CALIBRATOR MODE SELECTORS - These determine which audio parameter is to be modified when the UP or DOWN pushbuttons are depressed. Any mode in use is disabled when another mode is selected. To cancel all calibration functions, push the leftmost OFF button. If the calibrator is not used for a minute or more, it will shut off automatically. For details on how to disable the calibration control section as a guard against unauthorized use, see "*Audio Control Options*".

UP and DOWN PUSHBUTTONS - After selecting the parameter to be adjusted, these buttons are used to raise or lower the corresponding calibration value. The VU meter of the channel being adjusted will brighten, and the value will continue to be raised or lowered until it reaches the limit of its range.

TRANSPORT SPEED INDICATORS These four LEDs display the fixed transport speed to which the present audio calibration values apply. If the speed is VARIED, these indicators remain switched to the last fixed speed to confirm which speed is being calibrated. All of the adjustments are duplicated for each position on the equalization selector, and each parameter must be calibrated for each combination of speed and equalization.

The reproduce de-emphasis and record pre-emphasis characteristics are selected automatically by the Audio Control Processor when the transport changes speed or the the equalization selector is switched from an NAB to an IEC position. The standard time constants used for the various combinations of speed and equalization selections are shown in the Audio Electronics section.



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This section describes the function of each of the controls found on the tape transport and the audio control panel, along with suggestions for their proper use. Familiarize yourself with all of these controls and indicators before operating the LJ-12. The *Tape Transport* section contains a step-by-step check-out procedure which should be followed after you have become familiar with the controls described in the following section.

The key components of the *Tape Transport* are illustrated in Figure 2-2, and are referred to by letter in the following sections, enclosed in brackets [ ].

### 2.1 POWER SWITCH

The *POWER SWITCH* is located on the front panel of the power supply chassis. Before applying power to the LJ-12, it is important to check that the setting of the *Mains voltage selector* corresponds to the local AC voltage (see "*Mains Voltage Selection*") and that a fuse of the proper rating is installed in the power supply. When the system is switched on, the five monitor LEDs on the Power Supply front panel will illuminate, along with the audio supply LEDs on the audio electronics chassis.

The tape transport will come on with the *STOP* push-button illuminated, and the tape counter display will be reset to zero. The IPS display will be set to the standard fixed speed that was in use when the recorder was last switched off. The audio control panel will be switched to the operational mode selected when the machine was last in use, with the exception of the *SAFE* and *READY* switches which will always be set to *SAFE*.

Each time power is applied to the LJ-12, The transport control computer executes a series of self-diagnostic tests on each of the vital systems in the recorder. Only after successful completion of these checks is the stop push-button illuminated and operation allowed to begin.

### 2.2 TAPE THREADING

Threading tape onto the LJ-12 is simple and straight-forward, as illustrated in Figure 2-1. From the *Supply Reel*[A], the tape should follow a path around the *Flutter-Arm*[B], then around the *Counter Wheel*[C]. The tape path continues across the *Heads*, then to the right and between the *Capstan Shaft*[T] and the *Pressure Roller*[S]. It continues in front of the *Tape-break Sensor*[R], then around the *Idler Wheel*[Q], then onto the *Take-up Reel*[P]. After threading the tape in this fashion, take up any slack in the tape by turning either reel, and be sure the tape is seated properly in the guides in the *Head Bridge*.

### 2.3 TRANSPORT CONTROLS and INDICATORS

The key components and operational controls of the *Tape Transport* are illustrated in Figure 2-2, and are referred to by letter in the following section, enclosed in brackets [ ].

**REWIND** - The leftmost blue push-button initiates the REWIND function which spools the tape onto the supply reel at high speed.

**FORWARD** - The rightmost blue push-button selects the FAST-FORWARD mode, which fast-winds the tape onto the take-up reel.

**STOP** - The white STOP push-button cancels any previously selected mode and stops the tape. If the recorder has entered the IDLE mode (see the "Standby Mode" section), depressing STOP will reactivate the tension system, allowing manual cueing of the reels.

**PLAY** - The green PLAY push-button initiates the reproduce mode with the playback source selected at the audio control panel (SYNC or OUTPUT). Depressing PLAY while in the record mode cancels recording with the proper bias punch-out delays.

**EDIT [L]** - This yellow push-button performs three different functions, depending on the transport mode in use when it is depressed.

In the standby mode, with the tape properly loaded and the tension system active, the EDIT button applies the brakes to hold the reel motors and disables the tension system, allowing the tape to be pulled away from the heads without being pulled back by the standby tension.

In the PLAY mode, or when the tape is broken, the EDIT push-button activates the DUMP EDIT mode, causing the tape to play off the supply reel and spill off the right-hand side of the deck without winding onto the supply reel.

When EDIT is depressed during the FORWARD or REWIND modes, the tape lifters will be retracted allowing the tape to contact the heads while fast winding. Pressing EDIT again in FAST will reactivate the lifters.

**RECORD [O]** - The red RECORD push-button causes recording to begin on those channels that are currently in the READY mode, as selected on the audio control panel (see "Audio Controls and Indicators"). Recording will not begin unless the transport is already in the PLAY mode. To begin recording from STOP, hold RECORD and depress PLAY.