

Owner's Manual

Model **G24S/G16S**

RECORDER/REPRODUCER



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
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."

SAFETY INSTRUCTIONS

1. Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions — The safety and operating instructions should be retained for future reference.
3. Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions — All operating and use instructions should be followed.
5. Water and Moisture — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
7. Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization — The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
12. Power Cord Protection — 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, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. Cleaning — The appliance should be cleaned only as recommended by the manufacturer.
14. Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. Object and Liquid Entry — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. Damage Requiring Service — The appliance should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the appliance; or
 - C. The appliance has been exposed to rain; or
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
17. Servicing — The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

INTRODUCTION

Congratulations on your purchase of the Fostex Model G24S/16S multitrack recorder.

The G24S/16S combines Fostex legendary reliability with the most up to date automation features. Please read this manual carefully before operation to obtain maximum results. We at Fostex have tried to create a "user friendly" machine as well as one whose functions and parameters offer unparalleled flexibility. With proper care and handling the G24S/16S will give you many years of top performance. If you have any questions or comments please contact your nearest Fostex authorized service center. Our technicians will be happy to be of service. Although this manual is written for G24S the basic differences between these two recorders are only on tape specifications and number of channels while other functions, etc. are the same. Points of differences are written inside () which are extracts from the G16S Owners Manual.

MAJOR FEATURES

- The G24S(G16S) is a 1(1/2)inch, 38cm/sec (15ips) 24(16)-track multichannel recorder featuring a variety of automated functions.
- A high degree of noise reduction and superior sound quality are presented by the Dolby S system employed for the first time. All tracks ON/OFF or track 24(16) only OFF settings available.
☛ Refer to page 2 for further information.
- Operability has been improved by providing a control panel which can change angles or be completely detached enabling you to have fingertip control of the G24S/G16S from your console location.
- Employment of the spot erase function allows you to erase items such as click noises by using the jog shuttle in the cueing edit function.
- The G24S/G16S contains a memory of 10 cue points; ideal for recalling data in one simple process.
- Shuttle repeat (repeated playback) is another convenience that uses the auto return function in conjunction with the auto play function.
- The G24S/G16S has a built-in $\pm 12\%$ pitch control function with the current tape speed indicated on the display.
- Location memory function automatically memorizes the last point of locate operation, (separately from the cue memory), allowing you to work more quickly and efficiently.
- The zone limit function can be used to prevent the tape from being completely wound off the reel. The G24S/G16S displays the remaining tape time even in the play mode, making it possible to manage the end zone more accurately.
- The G24S/G16S has bargraph level meters which can display four mode settings such as peak hold, "zooming" to 0dB, etc.
- Synchronizer card 8330. Optional installation of this card enables the recorder to do sophisticated synchronization, slave/master functions with other recorders.

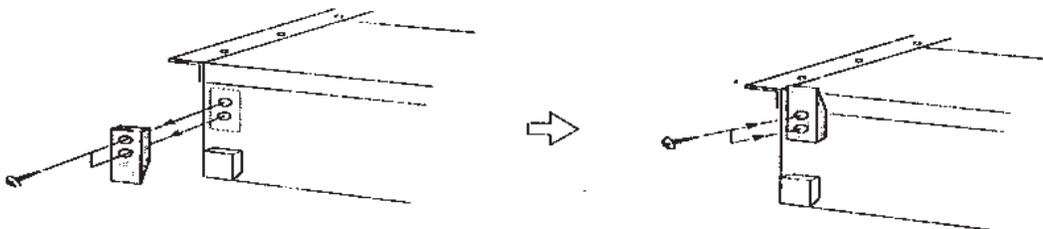
CAUTION-1

Full attention should be paid to ventilation as heat sinks are located on the top side of G24S/G16S, and G24S in particular, generate quite an amount of heat.

- Do not place anything on the top side.
- Always maintain more than 10 centimeters of space above and around the top side.

CAUTION-2 (G24S)

Model G24S, when shipped from the plant, has the two front feet on the bottom side installed for flat operation of the recorder (the feet are not protruding beyond the front panel). In such a direction of installation, the recorder will not stand firmly when placed upright (vertical attitude) and is extremely dangerous. If you must operate it in an upright position, be sure to unscrew the two front feet and reverse their mounting direction so that they extend beyond the front panel plane as shown in the drawing below.



ON DOLBY S

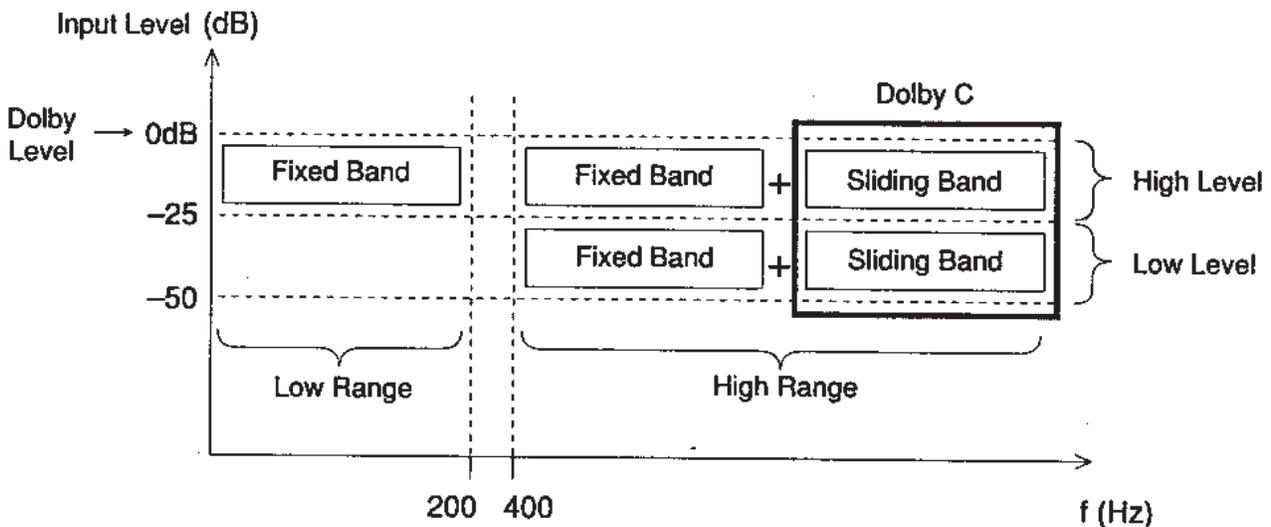
What is Dolby S.....?

The Dolby Type S Noise Reduction System, employed for the first time in Fostex Model G24S/G16S, will be explained below in brief. Dolby S, while inheriting the Dolby SR technique, "the ultimate noise reduction (NR) system" developed for commercial use, is a revolutionary NR system modified to the greatest degree of excellence for consumer use by rationalizing its circuit.

Composition of Dolby S

IN Dolby S, as shown in Figure: "Basic concept of Dolby S", the entire frequency band is divided into low and high ranges at around 400Hz (the low range is processed from 200Hz and below); and further the level is divided, from Dolby level to -25dB as high level and below this down to -50dB as low level, and a maximum of 12dB processing applied to each high and low level groups. One stage of the fixed band type^{*1} processor for the low level group, and two stages each of the fixed and sliding band type^{*2} are provided for the high level group.

Now lets compare this with the conventional Dolby C type. The C type has a sliding band for the high region in the high and low levels (indicated in box of Figure: "Basic concept of Dolby S"). The reason for dividing it into two levels is to compress, in one step only for the high level input signal and in two steps for the low level signal, to maintain optimum processing figures against the signals while attaining noise reduction. Operating merits of each system can be expected in the S type by combining the fixed band to this. The real value of Dolby S is clearly revealed here and the importance in sound quality is stressed. And by also providing one stage of fixed band in the low region, the NR effect is applied to the entire frequency band. As a result, it can reduce noise in the low region by 10dB. Furthermore, the high region noise suppression amounts to 24dB acquired by two stages of maximum 12dB each which exceeds 20dB in the C type.



Basic concept of Dolby S

***1 Fixed band:**

Even in the superior sliding band, it does have faults. When the music signal is concentrated in the comparatively high frequency (3kHz and higher), the NR effect drops in the band lower than the music signal since cutoff slides toward the higher side. To compensate this, the NR effect is maintained by using the fixed band for the region below 6kHz.

***2 Sliding band:**

Compared to the full band type NR, even though music signals around 400~1,000Hz exist, it has the superior nature of not largely degrading the NR effect above 1kHz (hiss noise is concentrated around 1~2kHz) compared to when there is no music signal. It can be said that this characteristic is cleverly employed in the C type.

Therefore, an ideal NR effect throughout the entire band is obtained by combining the two types of processing circuit to utilize the merits of both types. The Dolby S thus, is an ideal NR system with high noise reduction capability, together with minimum affect on sound quality, attained by cleverly combining five processing circuits for non-demanding processing of the signals.

This is a heretofore unknown high level system which demands high basic performances from the recorder in order to draw out its superior characteristics. The G24S can be used without hesitation as it more than fully comply to this demand.

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ADVANCED OPERATION

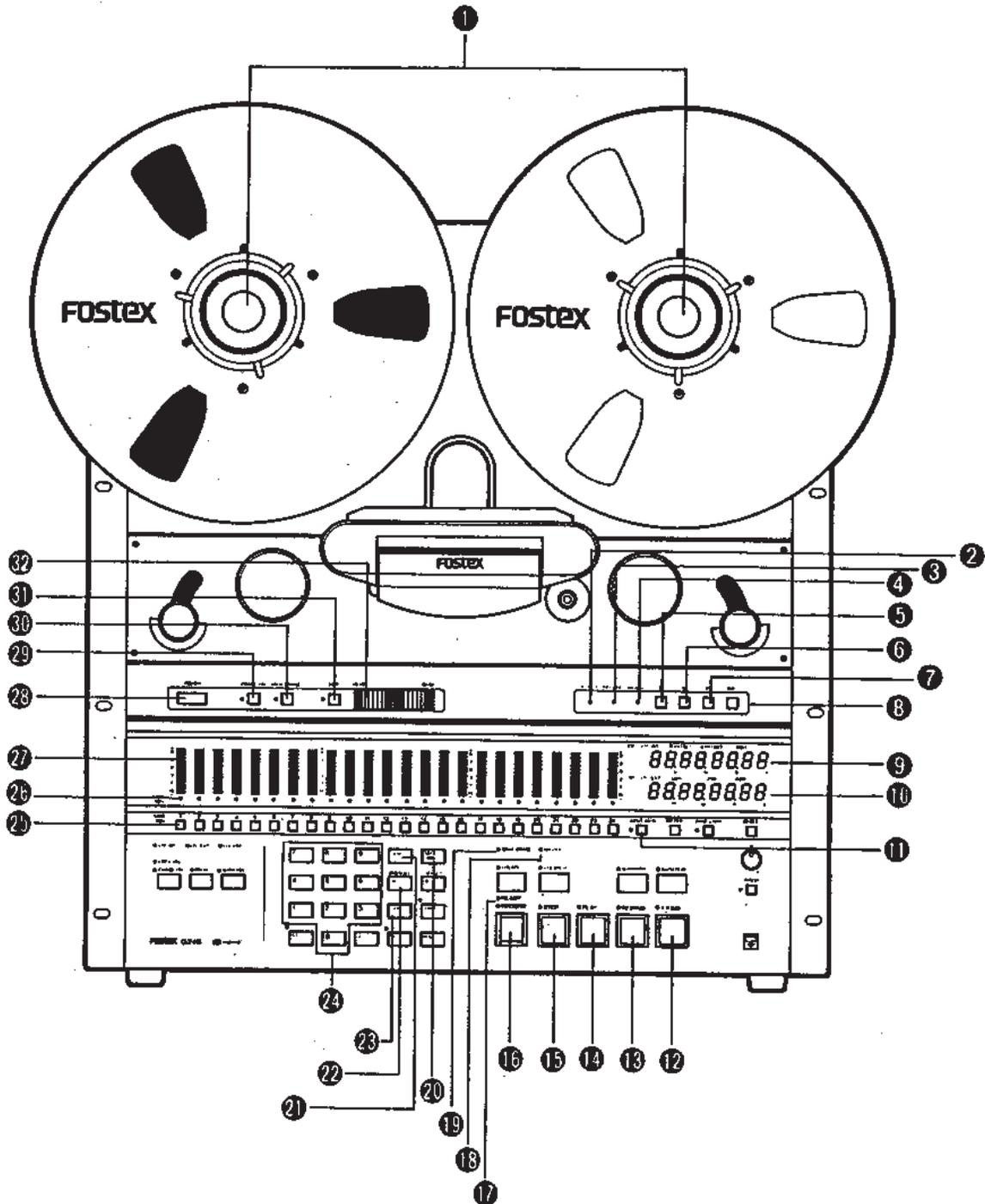
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Front Panel

Controll Panel (A)



BASIC OPERATION

Explained on the following pages are:

- Basic operation of Recording and Playback
- Method of Cueing
- Method for Spot Erasing

1. NAMES AND FUNCTIONS OF CONTROLS

Front Panel, Control Panel

*Bracketed words are printed descriptions of Panel controls. However, each switch, button, display, etc. will be boldfaced in the text. Example: (By pressing the **PLAY** button....).

- 1 **Reel Clamp**
Secures the tape reel on the spindle. Lock firmly by CW (clock-wise) rotation. Be sure to lock the clamp when loading the reel.
- 2 **[POWER] LED**
Will be lit when **POWER** is switched on.
- 3 **[RECORD] LED**
Lights when recording.
- 4 **[READY] LED**
Will be lit when the **RECORD** and **PLAY** button are simultaneously pressed, and there are no tracks in record ready status.
- 5 **STOP [■] Button**
This button is basically the same as the **STOP** button on the controller with some added functions.
☞ Please refer to page (42).
- 6 **PLAY [▶] Button**
Functions the same as the **PLAY** button on the controller.
- 7 **REWIND [◀◀] Button**
When this button is pressed, high speed winding will start. If pressed and held, the G24S/G16S will rewind outside the effective zone limit.
- 8 **FAST FORWARD [▶▶] Button**
When this button is pressed, high speed winding will start. If pressed and held, it will fast forward outside the zone limit.
☞ Please refer to page (33) for detail of the zone limit.
- 9 **Tape Time Display**
The present time of the tape is thus displayed.
- 10 **Memory Display**
Displays time data in the memory and time data while editing. The set values of various parameters, etc. are indicated here.
- 11 **Input Monitor [INPUT MON] Switch/LED**
This switch is used to enter the "all input" monitor mode (all tracks in input monitor mode). The **INPUT MON LED** will light. Indication will change in accordance with the selected monitor mode of the recorder.
☞ Refer to page (30) for further information.
 1. Extinguished: All tracks will be in tape monitor (playback signal of that track is OUTPUT).
 2. Slow Blink: Individual input monitor 1.
 3. Fast Blink: Individual input monitor 2.
 4. Lighted: All tracks are in input monitor (Signal input to that track is OUTPUT).
☞ Refer to "Function of [RCL] → [?]" for details on individual input monitors 1 and 2.

⑩ FAST FORWARD [F FWD] Button/LED

There are two speeds in fast forward. While holding this button down, the tape will run in fast forward at low speed. Cueing (fast forwarding while monitoring the sound), can be done by simultaneously pressing the **PLAY** button, while keeping this button pressed. To cancel cueing, repeat this process, or press either the **STOP** button, or **PLAY** button. The LED will light when the tape is winding in either fast forward speed.

⑪ REWIND [RWD] Button/LED

Functions the same as the **F FWD** button. Rewinding at high speed, low speed, cueing, etc. is the same. The **RWD** LED is lit when the tape is rewinding in either speed.

⑫ PLAY [PLAY] Button/LED

This button is pressed for recording (together with the **RECORD** button) and playback. The LED is lit when the tape is in play and blinks during cueing mode.

⑬ STOP [STOP] Button/LED

This button is pressed to cancel or stop modes such as play, record, etc. If this button is pressed longer than 0.5 seconds, the transport drive mechanism will be cancelled. Press it again and the drive mechanism enters the standby mode, ready to enter the next operation. If the **PLAY** button is pressed when the drive mechanism is in the cancelled state, it will momentarily enter standby, then enter the play mode. If the **STOP** button is pressed while pressing the **PLAY** button during the recording mode, tracks in the recording mode will punch-out.

The drive mechanism state is indicated by the three LED patterns shown below:

1. **Fast Blink:** Drive mechanism is cancelled.
2. **Lighted:** Standby.
3. **Slow Blink:** Entered in the cueing mode.

CAUTION: Do not shut the power off while driving the cam.

⑭ [RECORD] Button/LED

When this button and the **PLAY** button are pressed simultaneously, any tracks previously in record ready status will enter the recording mode. If this button is pressed simultaneously with the **PLAY** button during the playback mode, tracks in record ready status will punch-in. Tracks in record ready status can be switched between individual input monitor (1 or 2) mode and tape monitor mode with each pressing of the **RECORD** button. **RECORD** LED is lit when the G24S/G16S is running in the record mode. When **ERASE ON** is lit, this LED will also be lit.

☞ Please refer to "Function of [RCL] → [?]" for details of individual input monitors 1 and 2.

⑮ [READY] LED

This will light when the **RECORD** and **PLAY** buttons are simultaneously pressed, and all the tracks are in safe status.

⑯ Noise Reduction Off [NR OFF] LED

The LED will change in accordance with the setting of the rear panel **DOLBY NR** switch ⑥.

1. LED is OFF:	All Tracks NR/ON
2. Slow Blink:	All Tracks NR/OFF
3. Fast Blink:	Track 16 only NR/OFF

⑰ Spot Erase [SPOT ERASE] LED

This function is the same as the ⑩ **SPOT ERASE** LED.

⑱ Safe/Ready [SAFE/RDY] Key

This key is pressed for selecting tracks to be entered into record ready status using the numerical keypad. This key allows you to enter a multiple number of tracks into record ready status.

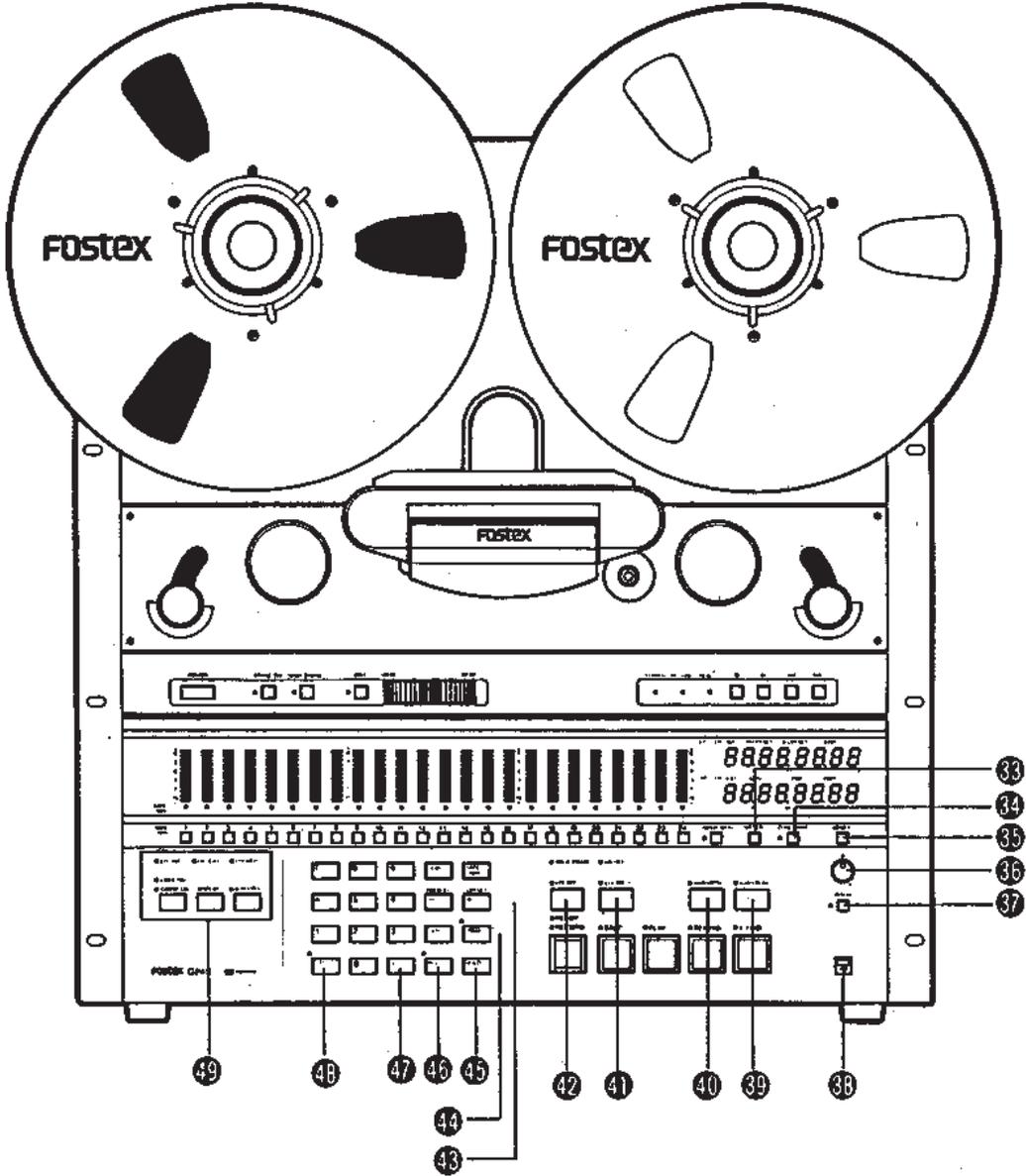
㉑ Plus 10 [+ 10] Key

This is used for selecting tracks 10 thru 24 (16). The 10th digit is entered by this key. This key is also used to set tape base thickness.

☞ Please refer to page (35) for further information.

- **Minus/Preroll [–/PREROLL] Key**
 This key is used when selecting multiple recording tracks with the numerical keypad for record ready status (specifying the range) or for setting preroll time.
 ☛ Refer to page (17) for further information.
- **Clear [CLR] Key**
 This key is used to clear various parameter values and exit from the various modes set. In addition, use this key to clear the display.
- **Numerical Keypad (0 ~ 9)**
 The numerical keypad is used mainly in selecting recording tracks, for input of time values and value setups of various parameters.
- **[SAFE/RDY] Selectors**
 For selecting the tracks to be entered into record ready status. The tracks selected can be changed to input monitor, by pressing the RECORD button (the signal which is being input to this track is directly fed to the output).
- **[SAFE/RDY] LED**
 Tracks in record ready status are indicated by alternating red and green lights. When the RECORD and PLAY buttons are simultaneously pressed to enter the recording mode, this LED will be red. The LED will be green in the SAFE mode.
- **Bargraph Level Meters**
 These indicate the input/output (recording/playback) level of each track. There are four different meter display modes (NORMAL, PARM, TEMP, or CAL).
 ☛ Refer to page (29) for further information.
- **[POWER] Switch**
 The ON/OFF switch for power to the recorder.
- **[ERASE ON] Button/LED**
 Press this button to engage spot erasing; the LED will light.
- **[SPOT ERASE] Button/LED**
 Press this button to enter the spot erase mode. The LED will blink.
 ☛ Please refer to page (20).
- **[EDIT] Button/LED**
 Press this button to enter the cueing mode; the LED will light.
- **Cueing Dial**
 This is used to search the tape when in the cueing mode.
 ☛ Refer to page (19) for further information.

Control Panel (B)



Control Panel (B)

● Meter [METER] Button

The dot remaining on the METER (any dot that is peak held due to permanent mode, of the METER display) is cleared when the METER button is pressed. The meter display mode will switch to normal mode as long as this button is held down. By releasing the button, it will return to the previously set mode.

☛ Refer to page (28) for further information.

● Zone Limit Button/LED

This button is pressed to initiate the zone limit function. The ZONE LIMIT LED will light or blink indicating the status of any zone limit functions. This LED is lit or blinking when the ZONE LIMIT button is pressed and the zone limit is functioning.

1. Lit: Tape present position is within the zone stored in the memory.
2. Blinking: Tape present position is outside the zone stored in the memory.
3. Extinguished: Zone limit is not functioning.

This function is cancelled by pressing ZONE LIMIT again. Refer to "Function of [RCL]→ [?]" for setup of the zone range.

● Reset [RESET] Button

The TAPE TIME display (upper side display) is reset to "  " when this button is pressed. All time data in the memory will be automatically shifted.

● Pitch Control [PITCH] Knob

This knob is used to change the tape speed. The variable range is $\pm 12\%$.

● Pitch Control [PITCH] Button/LED

This button is pressed to initiate the pitch control function. The PITCH LED will blink, and the changed value of the tape speed will be shown on the MEMORY display.

☛ Refer to page (28) for further information.

1. Blinking: Pitch control is in operation.
2. Extinguished: Pitch control is cancelled (tape will run at standard speed regardless of the setting of the control knob).

● Panel Lock Release Knob

The lock that fixes the control panel in an upright position is released by pressing this knob.

☛ Refer to page (22) for further information.

● Auto Play [AUTO PLAY] Key/LED

This key is pressed to initiate the auto play function. Upon completing the locate function, (automatic locating to a specified position) the play mode will be entered automatically. AUTO PLAY LED will light. Pressing this key again cancels the auto play function. The remaining time from the tape's present position to the end of the zone can be shown on the MEMORY Display by using this key and the RCL key.

☛ Refer to "Function of [RCL] → [?]" for details.

Recording efficiency can be improved by use of this cue memory. For example, when locating is to be done, it would be a tedious job to enter each locate point with the numerical keypad. It is much easier if data is registered in this cue memory for later recalling in one simple process.

This RCL → n is provided mainly for the above mentioned operation. For the purpose of the above operation the time data must be registered in the desired cue memory. To do so, the CLR key, STO key, ([·] key), and numerical keypad are used. The method for using these keys is also applicable to registering in memories other than the cue memory.

● Auto Return Key/[AUTO RTN] LED

Press this key to activate the auto return function. Auto return is organized between two time points. When the AUTO RTN key is pressed, the LED will light. If the auto return memory is incorrectly registered (zero time width, etc.), the LED will blink to warn of this discrepancy. When inside the two time points registered in the auto return memory, upon reaching the end of the start point of RWD, the G24S/G16S will automatically rewind to the objective point and stop there. If this key is pressed again, the auto return mode will be cancelled. Refer to "Function of [RCL] → [?]" for the method of registering the zone in the auto return memory.

⑪ **Locate 0 [LOCATE 0] Key/LED**

When this key is pressed, the G24S/G16S will automatically rewind or fast forward to the specified zero location and stop. At this zero point, the tape time display will be . The LED will light when using this function.

⑫ **Locate [LOCATE] Key/LED**

This key is pressed to automatically rewind or fast forward the transport. The tape will stop at the locate point presently entered in the locate memory. The LED will light.

☛ Refer to page (32) for further information.

⑬ **Plus/Offset [+ /OFFSET] Key**

This key is used to change parameters while editing time values in the trim mode. OFFSET is a function which is effective only when the optional synchronizer card is installed. Refer to the item below for further information.

⑭ **Trim [TRIM] Key/LED**

This key is pressed to enter the trim mode. In the trim mode, the various time values can be edited (continuous increase/decrease) by using the + /OFFSET key and the - /PREROLL key. The G24S/G16S will exit from the trim mode and enter the normal mode when pressed again. The LED will light when the trim mode is entered by pressing the TRIM key.

⑮ **Hold [HOLD] Key**

When this key is pressed the tapes present position value, indicated on the TAPE TIME display (upper side display), will be copied on the MEMORY display (lower side display). This function is convenient when registering cue memory for locating while listening to the tape. The total time in the zone can be indicated on the MEMORY Display by using this key and the RCL key.

☛ Refer to "Function of [RCL] → [?]" for details.

⑯ **Recall [RCL] Key/LED**

This key is used for checking time data and for setting modes displayed on the MEMORY display (lower side display). The LED will light when the RCL key is pressed. Pressing any other key will turn off the LED and the MEMORY display will indicate the current status of time data and mode setups presently stored in the memory.

⑰ **Period [·] Key**

This key is used to move the cursor while editing time data and changing various parameter values.

☛ Refer to page (31) for further information.

⑱ **Store [STO] Key/LED**

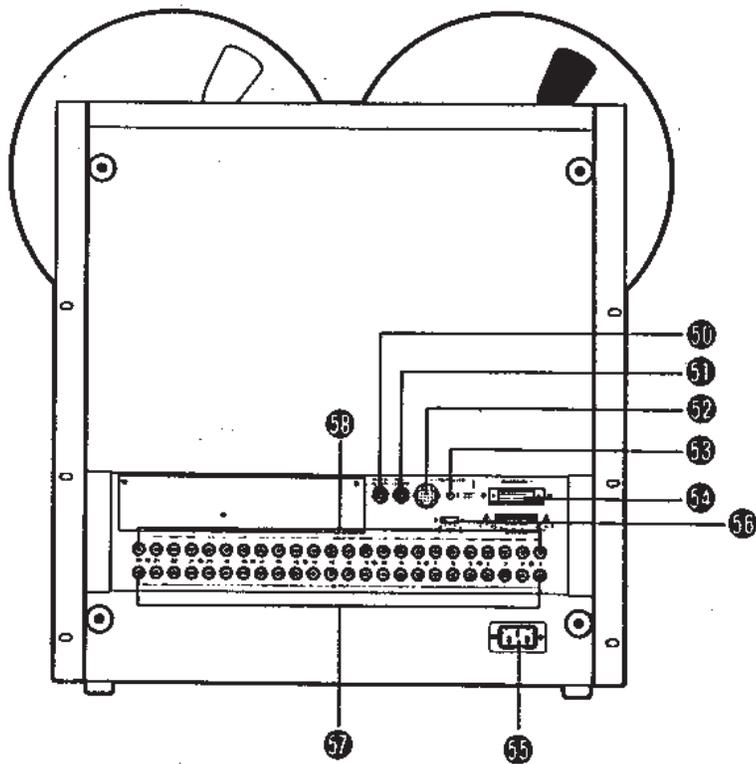
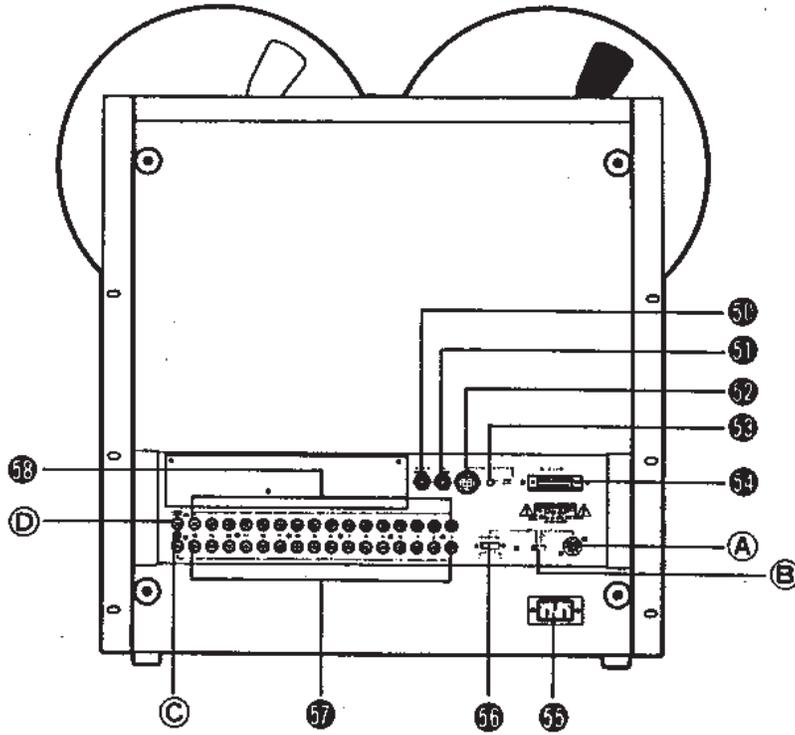
This key is pressed to register various data in the memory. The STO key is also used for changing the sort mode and direct locate mode. The LED will light when the STO button is pressed, indicating the current status of data being stored in the memory, and will blink when executing the direct locate mode. Press the STO key again and the LED will turn off, indicating that you have exited this mode. Data registered will be battery backed up even after the main power has been switched OFF.

☛ Refer to page (47) for further information.

⑳ **Option Key Area (OPTION keys)**

These keys and LED's become effective when the optional synchronizer card, model 8330, is installed.

Rear Panel



Rear Panel

● [PUNCH-IN/OUT] Jack

For plugging in a Fostex model 8051 footswitch (optional).

☛ Refer to page (19) for further information.

● [PLAY/LOCATE] Jack

For plugging in a Fostex model 8051 footswitch (optional). Stepping on the foot switch, when the G24S/G16S is in the stop mode, will automatically enter it into the play mode. When in other than the stop mode, it will automatically enter locate operation. If the foot switch is stepped on during locate operation, it will enter play mode after completing the locate operation.

Note

Using two footswitches in ⑧ and ⑨ is very convenient for rehearsal.

● [CONTROLLER] Connection Terminal

The controller unit, normally installed on the front panel, can be removed and be remote controlled with the optional extension cable.

☛ Refer to page (23) for further information.

● [CONTROLLER] Unit Selection Switch (FRONT/REAR)

FRONT: When the controller is connected to the front panel.

REAR: When the controller is connected to the rear **CONTROLLER** connection terminal. This is switched depending on how the controller is connected. This button, however, controls only for **METER**, **PITCH** knob, and **PITCH** button. All other functions will be effective regardless of which side the controller is connected to.

● [ACCESSORY 1] Terminal

This terminal is for connecting an optional Fostex model 4030 synchronizer. This is NOT the optional internal synchronizing card.

● [AC IN] Terminal

The power cord is connected to this terminal.

● [DOLBY NR] Switch

ON/OFF switch for the Dolby C noise reduction system. Setting selections are: ON/OFF/CH16 OFF. The setting of this switch is indicated by NR OFF LED on the control panel.

1. ON:	All tracks ON.
2. OFF:	All tracks OFF.
3. 16CH OFF:	Track 16 only OFF.

Note

This item is explained in greater detail in ⑩.

● [OUTPUT] Jacks

Audio output jacks for Tracks 1 - 24(16) (unbalanced/RCA pin jacks).

● [INPUT] Jacks

Input jacks to tracks 1 - 24(16) (unbalanced/RCA pin jacks).

The following four functions are for G16S only and are not applicable to G24S.

A External NR connector (EXT NR)

B Internal/external NR selecting switch (INT/EXT)

The above are reserved for future use. Be sure to always set the INT/EXT NR switch to INT.

C [16 OUT] Jack

This is connected in parallel with **OUTPUT 16** (unbalanced/RCA pin jack). This is convenient when playing back the time code on track 16 and simultaneously sending the code to other equipment.

D [LOOP OUT] 16 IN Jack

This is connected in parallel with **INPUT 16** (unbalanced/RCA pin jack). Use this jack when outputting to equipment other than a G16S. The time code generator output is connected to **INPUT 16**.

2. CONNECTIONS

The following is one example of possible connections for the G24S/G16S.

a) Connection of Foot Switches

Connect the optional Fostex 8051 foot switches to the **PUNCH-IN/OUT** jack or the **PLAY/LOCATE** jack, respectively, in the rear panel.

b) Connection of Patch Bay

Connect **GROUP OUT 1 - 8(4)** of the mixer with the optional Fostex patch bays 3011, 3012, or 3013. Then, using a multi-cable, wire into **INPUTS 1 - 12(8)** of the G24S/G16S. In the case of using an 12(8) group out mixer, a patch bay is not necessary.

NOTE

Each of the **INPUTS 13 - 24(9 - 16)** of the G24S/G16S are connected in parallel with **INPUTS 1 - 12(1 - 8)**.

c) Connection of Mixer

Wire **OUTPUTS 1 - 24(1 - 16)** of the G24S(G16S) to **TAPE IN** of the mixer; use three(two) 8-channel cables accordingly.

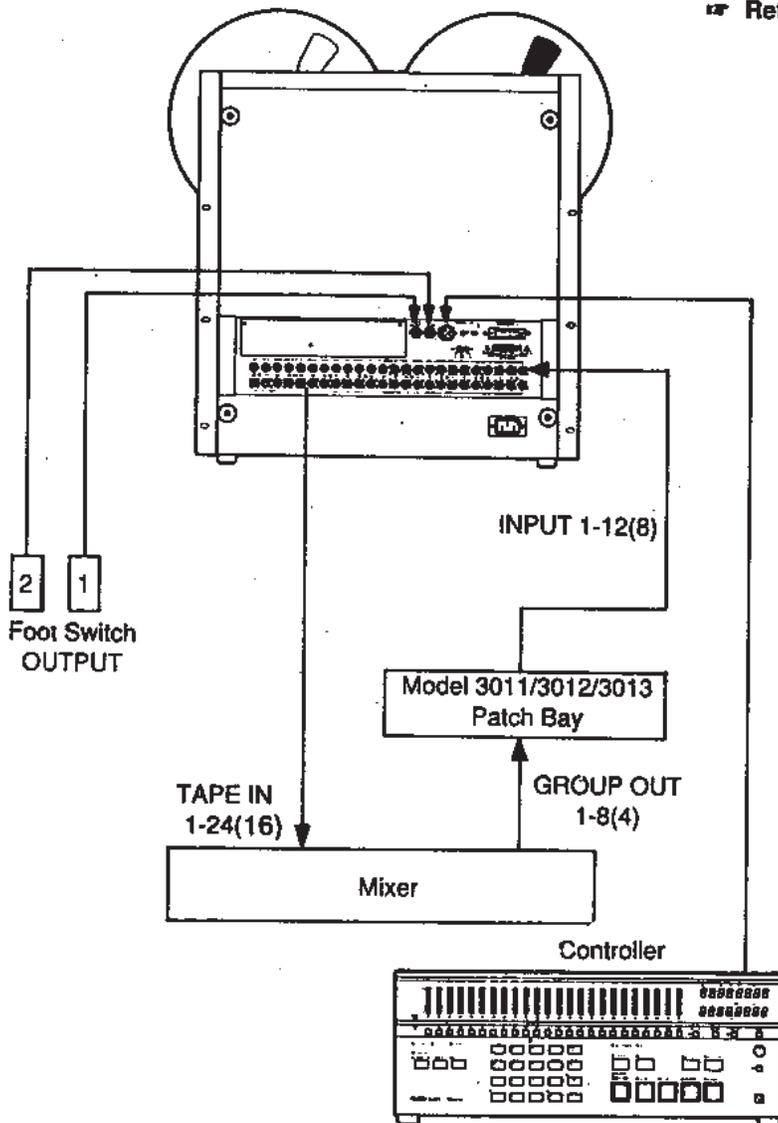
NOTE

Multi-cables are optional. There are 4 or 8 channel color cables available. (MODEL 8041~8048)

d) Connection of Controller

If you wish to locate the controller at your console, remove the controller from the front panel of the G24S/G16S. Using the optional extension cable, (Fostex 8546) connect the controller to the **CONTROLLER** terminal in the rear panel. Then set the **FRONT/REAR** switch of the controller unit to **REAR**.

☛ Refer to page (22) for further information.



* The Above illustration shows an example connection with G24S. Bracketed figures are when using G16S.

3. PREPARATIONS FOR RECORDING

The Recording tape

The bias and equalization of the G24S/G16S is adjusted for Ampex 456 or equivalent tape as shipped from the plant. The amplifier must be readjusted if other types of tape are to be used.

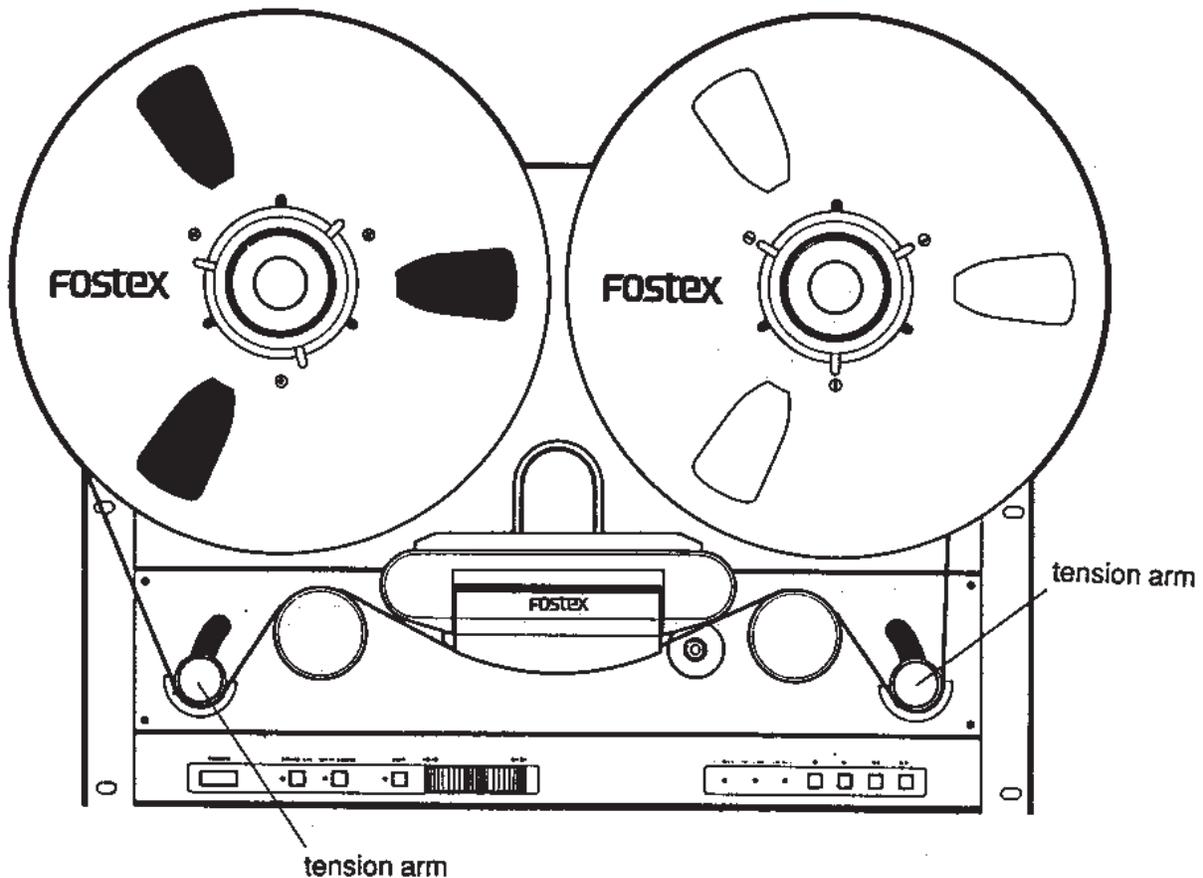
Approximately 30 minutes of record/playback are possible with the G24S/G16S on a ten inch reel of 50 micron tape (Ampex 456) at 38cm/sec. tape speed.

Loading the tape

To load the tape, first attach an empty reel to the right side reel spindle, and the reel containing tape to the left side. Thread the tape as shown below, making sure the tension arms are up. Lightly take up the slack by winding the reels. If the tape is slack the transport will not operate.

NOTE

If you are using a "master winding" technique (also known as "tails out"), the tape will be loaded in the opposite manner from the above method.



4. RECORDING

1) Pre-check Recording Levels and Sound Quality.

The G24S/G16S is an extremely high quality machine but it will record only those signals that are fed into it. A thorough understanding of signal routing through the microphones, mixers, patch bays etc. is important if the G24S/G16S is to be utilized to its full capacity.

(a) Set any track(s) to be recorded to record ready status. There are two methods for entering record ready status.

- **Method 1: Using the SAFE/RDY Selector**
Select the track you wish to check by directly pressing the **SAFE/RDY** selector ②. The **SAFE/RDY LED** ⑤ will alternately flash red and green.

- **Method 2: Using the SAFE/RDY Key and Numerical Keypad**

When the **SAFE/RDY** key ② is pressed, "t" (first letter of "track") will be shown in the **MEMORY** Display.

Tracks are specified using 1 thru 9 of the numerical keypad, and the +10 key. In this process, selection is not done by pressing each key. The **-/PREROLL** key ③ must be used to specify tracks as shown in the following:

Example 1: To specify track 1: Press in order 1, **-/PREROLL** key, 1.

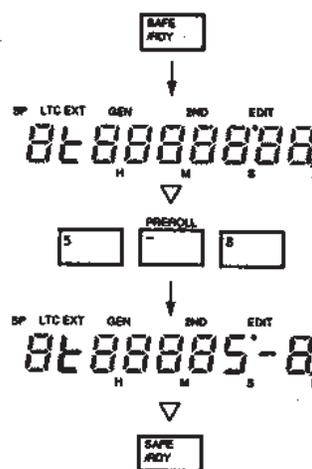
Example 2: To simultaneously specify tracks 5 ~ 8: Press in order 5, **-/PREROLL** key, 8.

Example 3: To simultaneously specify tracks 1 ~ 16: Press in order 1, **-/PREROLL** key, +10 key, 6.

Example 4: To simultaneously specify tracks 18 ~ 22: Press in order +10 key, 8, **-/PREROLL**, +10 key, +10 key, 2.

*** Numbers keyed in on the **MEMORY** display will be shown together with "-".

- The **CLR** key ④ is pressed to clear the machine of any tracks selected to ready ON. In this process, all tracks will simultaneously go to ready OFF. If a particular track must be turned OFF, press the **SAFE/RDY** selector of that track.
- The **SAFE/RDY LED** of any track selected for record ready status will alternately blink red and green. After selecting a track, press the **SAFE/RDY** key again to exit from this mode. In the case of example 3, the "t 1 - 16" indication on the **MEMORY** display will go OFF and return to the original state.



- (b) Press the **RECORD** button **Ⓜ** to enter input monitor status. The LED of **INPUT MON** will blink. Check the recording level and sound quality of the source.
- (c) After checking all of the recording level(s), press the **RECORD** button again to cancel input monitor status. The **INPUT MON** LED will go OFF.

2) Recording/Playback

- (a) Start the recording by pressing the **RECORD** and **PLAY** buttons simultaneously. The **RECORD** LED and **PLAY** LED will light as well as the red **SAFE/RDY** LED of the track(s) in record ready status.
- (b) Upon completing the recording, press the **STOP** button. The **STOP** LED will light and the **SAFE/RDY** LED will resume flashing red and green (alternately).
- (c) Turn OFF the **SAFE/RDY** selector of the track(s) recorded on.
- (d) Playback the recording by pressing the **PLAY** button to check the sound for satisfactory results.

3) Overdubbing

Overdubbing is recording other parts while monitoring the track(s) already recorded.

- (a) Select the track(s) you wish to overdub, and set the recording level(s) etc., in the same way as in (1) on the previous page.
- (b) To rehearse while listening to the already recorded tracks before overdubbing, press the **PLAY** button only, while in individual input monitor status.
- (c) To overdub (take), press the **RECORD** button, and **PLAY** button simultaneously after entering record ready status (any track(s) entered in recording status will go into input monitor status).

4) Punch-in/Out

Punch-in/out is the process of re-recording a faulty section of previously recorded tape. The starting point of the recording is called punch-in, and the ending point, punch-out. Using the automatic functions, auto play, auto return, etc. is very convenient.

Rehearsal

- (a) Advance the tape to a point slightly before the punch-in point, and enter the track(s) to record ready status.
- (b) Press the **PLAY** button to enter all tracks into the tape monitor mode.
- (c) Press the **RECORD** button when the tape arrives at the punch-in point (**INPUT MON** LED will blink). Only the track(s) set in record ready status will switch from tape monitor to input monitor mode. This allows the sounds in rehearsal performance to be heard.
- (d) Press the **RECORD** button again when the tape reaches the punch-out point. Monitoring of the track(s) will then switch back from input monitor to tape monitor. At this point the **INPUT MON** will turn off.
- (e) After completing the rehearsal, press the **STOP** button.

Take

The faulty section will be replaced. The following methods can be used for employing the punch-in/out process.

Method 1 This method uses the [RECORD] button and [STOP] button.

- (a) Set the track(s) to be punched in/out to record ready status and press the **PLAY** button.
- (b) When the tape arrives at the punch-in point, press and hold the **PLAY** button and then press the **RECORD** button, which will accomplish punch-in.
- (c) When the tape arrives at the punch-out point, while pressing the **PLAY** button, quickly press the **STOP** button. This will accomplish a punch-out.

Note

Holding the **STOP** button longer than about one half of a second will put the G24S/G16S in the full stop mode.

Method 2 This method uses the [SAFE/RDY] selectors.

- (a) Cancel record ready status for all tracks and simultaneously press the **RECORD** and **PLAY** buttons. The **READY** LED will light.
- (b) When the tape reaches the punch-in point, press the **SAFE/RDY** selector of the track(s) to be punched in/out. This will accomplish punch-in. The **READY** LED will go off and the **RECORD** LED will light.
- (c) When the tape arrives at the punch-out point, press the **SAFE/RDY** selector of the track(s) again to punch-out. At this point the **RECORD** LED will turn off and the **READY** LED will light.

Method 3 This method uses the Fostex 8051 foot switch (optional).

- (a) Plug the foot switch into the **PUNCH-IN/OUT** jack ⑩ on rear panel.
- (b) Enter the track(s) to be punched in/out to record ready status, and press the **PLAY** button.
- (c) Step on the foot switch once when the tape arrives at the punch-in point. This will accomplish punch-in.
- (d) Step on the foot switch once again when the tape arrives at the punch-out point to punch-out.

5) Cueing Mode

The cueing feature is used to search for a desired point you wish to edit while monitoring the sound using the **CUEING** dial, or, to find the head of a song. The cueing mode can be entered only from the **STOP** mode.

• Method of Cueing

1. Press the **EDIT** button to initiate the cueing mode. The **EDIT** LED will light indicating this mode has been entered.
2. The tape will advance toward the takeup reel (right hand reel) when the **CUEING** dial is rotated clockwise. Tape speed increases as the **CUEING** dial is further rotated CW.

3. The tape will advance towards the supply reel (left hand reel) when the **CUEING** dial is rotated counter clockwise. Tape speed will increase as the **CUEING** dial is further rotated CCW.
4. By using this feature, you can locate the beginning of a song by rotating the dial back and forth while monitoring the sound.
5. To Exit from the cueing mode, press the **EDIT** button again. The **EDIT LED** will go OFF.

NOTE

The Cueing function is possible even outside the zone limit parameters.

6) Spot Erase Mode

Spot erasing is the technique of erasing any extraneous sound or noise that may detract from the performance; such as a cough or dropped drumstick. The spot erase mode can be entered only from the **STOP** mode.

- **Method for Spot Erasing**

1. Press the **SPOT ERASE** button to initiate the the spot erase mode. The front panel and control panel **SPOT ERASE LEDs** will blink and the **EDIT LED** will light.
2. Search with the **CUEING** dial for a location on the tape near the spot erase point.
3. Put the track(s) for spot erasing in record ready status. The **SAFE/RDY LED** of these track(s) will flash alternately red and green.
4. Rotate the reels with your hand to search for the spot erase point. After the point is accurately located, carefully move the tape back to just before the point.
5. To spot erase, rapidly rotate the reel by hand in the play direction and press the **ERASE ON** button when you arrive at the spot erase point. Keep the **ERASE ON** button pressed until the end of section to be erased. The **ERASE ON LED** will remain lit as long as the **ERASE ON** button is pressed. This indicates that the tape is being spot erased.
6. After passing the section to be erased, release your finger from the **ERASE ON** button. The **ERASE ON LED** will go off to indicate completion of erasing. Then release your hand from the reel.
7. Press either the **SPOT ERASE** button again or the **EDIT** button to exit from the spot erase mode. The **SPOT ERASE LED** and **EDIT LED** will go OFF indicating you have cancelled the spot erase mode.

NOTES

- When spot erasing, the reel must be "quickly" rotated by hand. If the reel is rotated by the **CUEING** dial or if hand rotating speed is slow, a click noise is apt to be recorded at the spot on the tape where the **ERASE ON** button was pressed. We suggest you practice this technique a few times before trying it on a "real" take. The manual process of holding/releasing of the **ERASE ON** button can be replaced by stepping/releasing, when the foot switch (optional) is plugged into the **PUNCH-IN/OUT** jack.
- If there is no track in record ready status, the **ERASE ON LED** will not light even though the **ERASE ON** button is pressed.
- The **RECORD LED** on the controller will light during the spot erase process and, the **SAFE/RDY LED** of the track being erased will change from flashing alternately red and green to red only.

ADVANCED OPERATION

Explained on the following pages are:

- How to handle the Remote Controller
- Applicable key operations for the various features provided

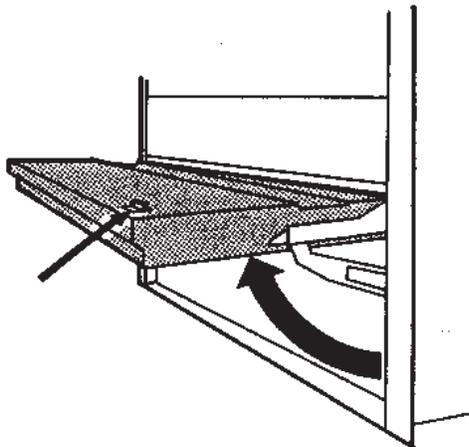
1. CONTROLLER

Changing Unit Angle

The Controller unit angle can be changed to 90°/45°/30° and 0° angles as shown below:

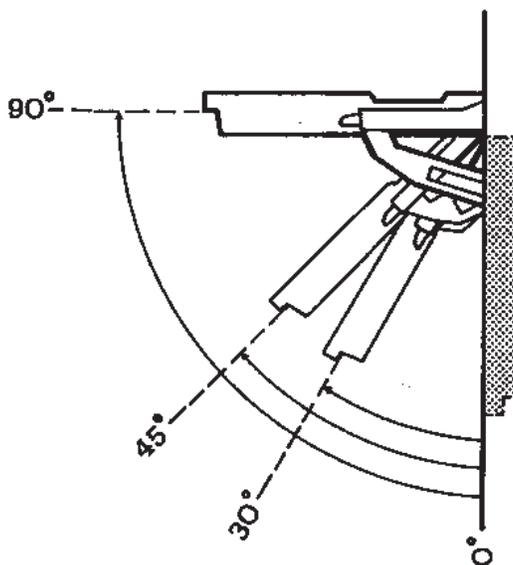
To change to 90°:

- Release the lock by pressing down the panel lock release knob .
- Raise the panel to the horizontal position (90°). It will lock automatically.



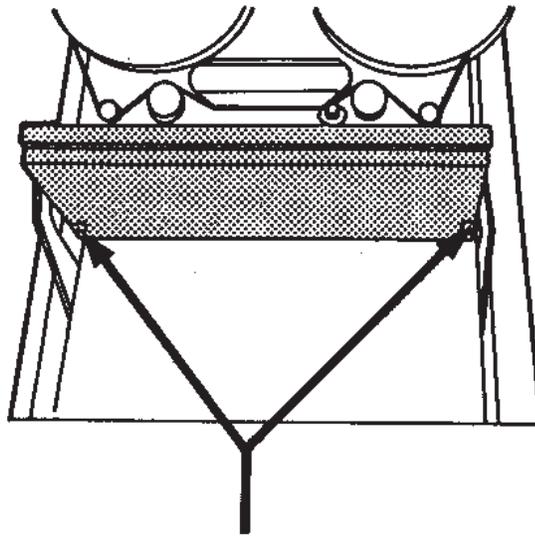
To change to 45° and 30°:

- As you lift the panel to the desired position, press down on the levers on both sides.
- Slightly lower the panel to lock into position.



Disconnection

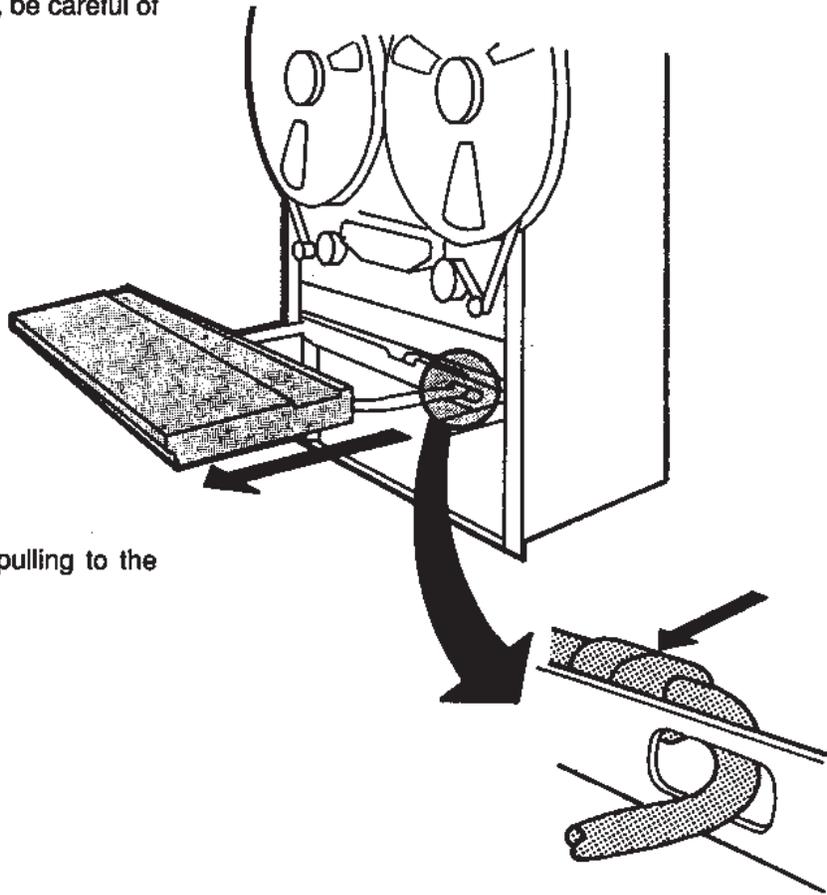
(a) Loosen the two screws as shown in the following figure:



(b) Pull the controller forward and remove as shown in the following figure:

NOTE

During removal of the controller, be careful of the connection cord.



(c) The connector is unlocked by pulling to the right.

Connection

- (a) Use the optional Fostex extension cable Model 8546 (this kit contains a false panel and a five meter length of exclusive extension cable).
- (b) Connect the cable to the **CONTROLLER** terminal ⑤ in the rear panel.
- (c) Set the **FRONT/REAR** controller unit selection switch ⑥ to **REAR**.

2. DISPLAYS

The LED indicators will function as follows:

- = Lighting
- ☼ = Blinking

(a) When "CP" is lit: Indicates the tape time converted from counter pulse.



(b) When "EDIT" is lit: Indicates the display is in edit mode.



(c) When "2ND" is lit: Indicates G16 is in 2nd mode.

NOTE

Additional LED functions are included with the installation of the optional 8330 synchronizer card.

Now you have the detailed explanations of G16's functions, of [RCL]→[?] and in 2nd mode. Furthermore, you can also refer to "G16 QUICK REFERENCE CHART OF COMMANDS" on page 49.

3. FUNCTIONS OF [RCL] → [?]

The RCL Key  is used in conjunction with other keys and buttons for many purposes such as parameter setups, confirmation of cue memory (time data), and for locating of various auto functions contained in the G24S/G16S. These are explained in detail below:

Note

- RCL → [?] means: press RCL and then press the desired key.
- Key pad numbers are used for data input.
- The period key [.] is used for selecting parameters.
- STO → [?] is used to store information, parameters, numbers, etc. in the memory.
- CLR key is used to clear the display and cancel incorrect data.
- RCL key, when pressed twice, returns previously set-up parameters.

1) [RCL] → [n] (Cue Memory Recall)

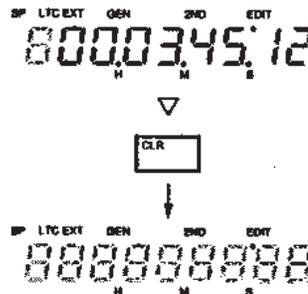
The G16 has a total of ten cue memories. In other words, a maximum of ten locations at any point on the tape can be stored in the memory. This operation is initiated by pressing in order: RCL key, n, time data registered in cue memory "n" will be shown on the MEMORY display and LOCATE LED will blink. When the LOCATE key is pressed, locating will automatically commence to the "n" point in the cue memory.

NOTE

n is any number entered using the numerical keypad 0~9.

Method 1 : Time data registered in cue memory as "n".

- Press the CLR key to clear the present MEMORY display.



- Enter time data using the numerical keypad. The numbers will shift to the left each time a number is keyed in. Enter the desired values for H (hour), /M (minute), /S (second) and /F (frame).



Example 1: To enter 1 hour, 3 minutes, 15 seconds, 10 frames, >>> Press in order : 1, 0, 3, 1, 5, 1, 0.

NOTE

"0" at the head of any data need not be entered.

Example 2: To enter minus 00 hour, 01 minute, 13 seconds, 12 frames: >>> Press in order : -/PREROLL, 1, 1, 3, 1, 2.



NOTE

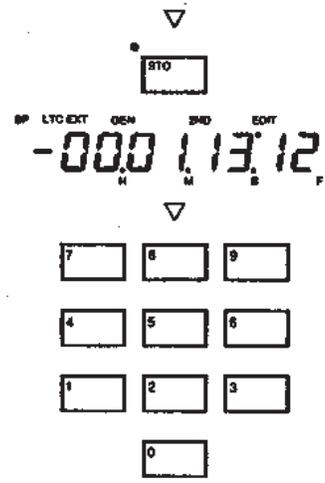
If you make a mistake, press the CLR Key and start over.

*** Minus Time Data can be registered if the -/PREROLL Key is pressed before entering numbers from the numerical keypad. When this key is pressed "-", indicating minus time, data will be shown at left end of the MEMORY display (it is not necessary to press the +/-OFFSET key to register plus time data). If you must return to plus time, press the +/-OFFSET key to cancel the "-" sign. If, for example, 62minutes is keyed in, time will be automatically converted to one hour, two minutes and registered.

3. After entering time data, press the STO key, and selected n. The corresponding time will be shown on the MEMORY display of cue memory "n".

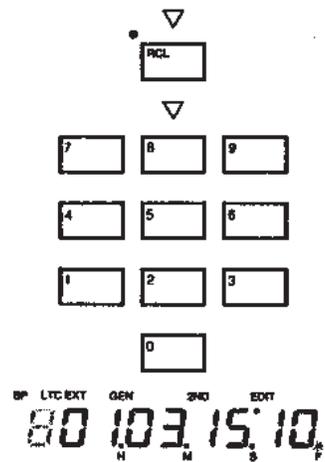
NOTE

When time data is registered in cue memory, data previously stored there will be cleared and the new data registered.



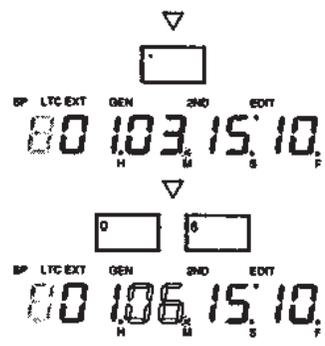
Method 2 - Changing the value recalled by [RCL] Key → [n]

1. Press in order: RCL key, n, to display data registered in cue memory "n" on the MEMORY display.

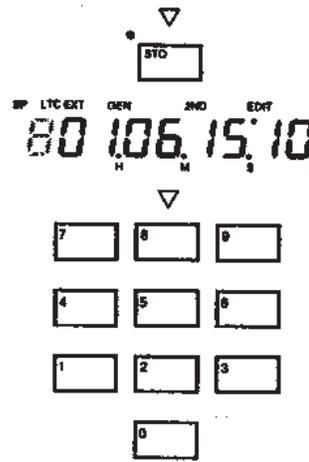


2. Press the [·] key to move the cursor to the digit (H/M/S/F) to be corrected (cursor will move to the left each time it is pressed). Then re-enter time data of that digit using the numerical keypad.

Example: To change time data entered as: 1hour, 3min., 15sec., 10frames, to 1hour, 6min., 15sec., 10frames, using the numerical keypad to enter 0, 6 as shown below:

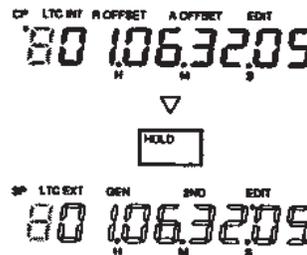


3. After correcting the time data, press the **STO** key, and selected **n** (using the numerical keypad), to store into cue memory "n".

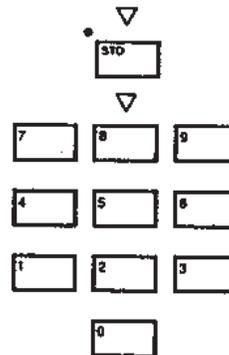


Method 3 - Real Time Registering by use of the [HOLD] Key

1. Playback the tape and monitor the playback sound. Press the **HOLD** key upon arriving at the point to be registered. The value of the tapes present position as shown on the **TAPE TIME** display, will be copied on the **MEMORY** display.



2. Next, press the **STO** key, and selected **n** (using the numerical keypad), to store into cue memory "n".



• Supplement: Time Data Correction by use of Trim Mode

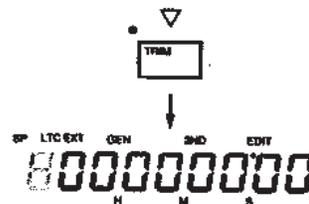
Instead of entering the time data using the numerical keypad, time data can be increased or decreased by using the **-/PREROLL** key or **+ / OFFSET** key after entering the trim mode by pressing the **TRIM** key. The two trim modes are explained below.

(1) All digit trimming: Trimming while shifting Up/Down All digits from H to F.

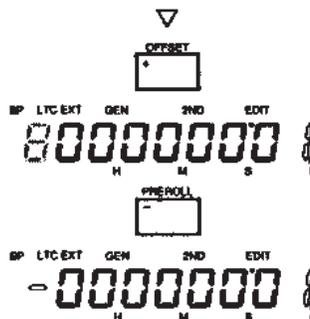
(2) Two digit trimming: Trimming of any digit, individually, from H to F.

• Method 1: All Digit Trim Mode

- (a) "All Digit Trim Mode" can be entered by pressing the **TRIM** key . The **TRIM** LED will light. The **MEMORY** display, F (frame) only, will blink; the others will be off.

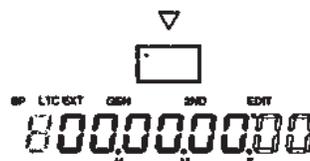


- (b) If the +/- **OFFSET** key is pressed once, while in this state, the time value shown in the **MEMORY** display will increase by one frame. It will continue to increase if the key is held down. Conversely, if the -/**PREROLL** key is pressed once, the value will decrease by one frame. It will continue to decrease if the key is held down. If the time value on the display becomes smaller than "00000000" when the -/**PREROLL** key is pressed, "-" (minus) will be shown preceding the number as it continues to decrease.

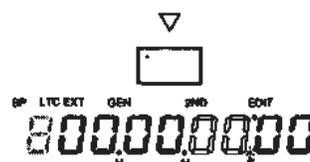


• **Method 2: Two Digit Trim Mode**

- (a) After entering "All Digit Trim Mode", "Two Digit Trim Mode" can be entered by pressing the [·] key. The dots of the three digits (H/M/S) in the **MEMORY** display will light and the dot of one digit (F), will blink to indicate that it has entered the "two digit trim mode".



- (b) The digit whose dot is currently blinking can now be increased/decreased. The blinking dot will shift to the left with each press of the [·] Key (F → S → M → H →).

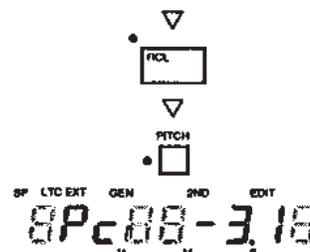


- (c) If the [·] key is pressed while the (H) digit is blinking, it will return to the "all digit trim mode." With each press of the [·] key, it will continue to cycle through "all digit" → "two digit (F)" → "two digit (S)" → "two digit (M)" → "two digit (H)" → "all digit" → "two digit (F)

- (d) To exit from the trim mode, press the **TRIM** key again; the **TRIM** LED will go OFF.

2) [RCL] → [PITCH] (Display of Pitch Control)

Tape speed changed by the pitch control function can be displayed on the **MEMORY** display. Normal speed is indicated as "0.0". The display will show the present tape speed as to the percentage it has changed, such as "Pc -3.1" (Pc is an abbreviation of pitch control). In this example, it indicates speed slowed down 3.1%.



3) [RCL] → [METER] (Selection of Meter Display Mode)

The G16 has four types of **METER** indication modes. The display mode it is presently in will be shown on the **MEMORY** display; the meter display mode can be changed using the following procedures:



- **Methods of Changing the [METER] Display Mode**

- (1) To change the meter display mode, press in order: **RCL** key, **METER** button.
- (2) Set the desired mode to be displayed by pressing the [.] key, which will successively change the display through each of the four modes, with each press of the key.
- (3) The mode displayed in step 2 above will be registered by pressing in order: **STO** Key, **METER** button. The content registered here will be battery backed up even though the main power is switched OFF.

- The four types of bar graph **METER** display modes.
The following are the four modes displayed:

(a) Normal Mode (MT nOMAL)

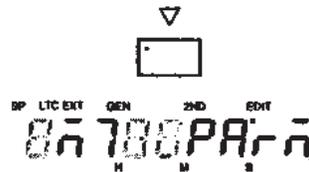
This is the normal peak meter mode. The 12 segments of the bar graph **METER** represent the levels, from bottom up, -20/-15/-10/-7/-5/-3/-1/ 0/ +1/+3/+5/+8 (dB) against the reference level (-10dBv).



(b) Permanent Mode (MT PArM)

This mode holds the uppermost segment which is the peak value. Contents of the bar graph **METER** 12 segments are the same as with the normal mode.

To cancel, press **METER** key.



(c) Temporary Mode (MT TEMP)

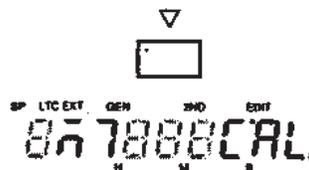
This mode holds, for approximately 1 second, the uppermost segment of the peak value. The contents of the bar graph **METER** 12 segments are the same as with normal mode.

For setting the hold time refer to page (27).



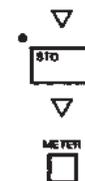
(d) Calibration Mode (MT CAL)

This mode is for calibrating (zooming up) the **METER** display to the reference of 0dB. Finer adjustments of levels are possible with this feature. The 12 segments of the bar graph **METER** represent the levels, from bottom up, -5/-4/-3/-2/-1.5/-1/-0.5/ 0/ +0.5/+1/+1.5/+2 (dB) against the reference level (-10dBv).



NOTE

If you want the same mode to be displayed every time, press in order: **STO** key, **METER** button.



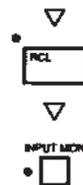
NOTE

The level setups in the calibration mode on the left, and the level setups in the normal mode on the right are shown against the reference level (-10dBv) which is divided into 12 segments.

(+)	(+)	
8	■	2
5	■	1.5
3	■	1
1	■	0.5
0	□	0 ← -10dBv
1	□	0.5
3	□	1
5	□	1.5
7	□	2
10	□	3
15	□	4
20	□	5
(-)	dB	(-)

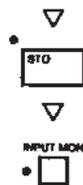
4) [RCL] → [INPUT MON] (Selecting Individual [INPUT MON] 1&2)

The G16 has the following two types of individual input monitor modes. The individual input monitor mode that the G16 is currently in can be shown on the MEMORY display by this operation.



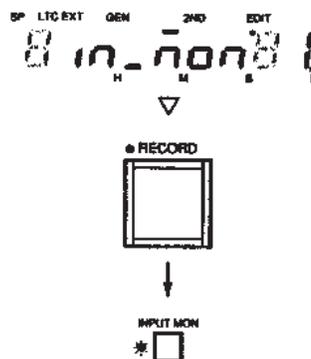
• Method for changing individual input monitor modes

1. Press in order: **RCL** key, **INPUT MON** button, to indicate the presently set mode on the **MEMORY** display.
2. To display a desired mode press the [·] key which will successively switch the display between input monitor 1 and Input monitor 2.
3. The mode displayed in above step 2 will be registered by pressing in order : **STO** key, **INPUT MON** button.



1. Individual Input Monitor 1 (in Mon 1)

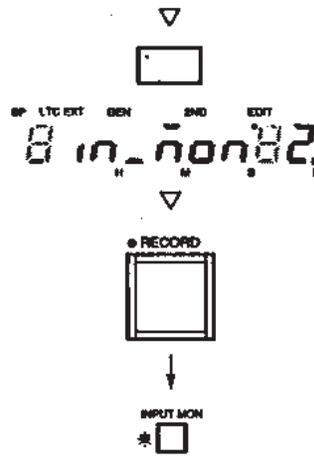
The individual input monitor 1 mode is entered by pressing the **RECORD** button. The tracks entered into record ready status and input monitor modes can be maintained in such modes even though tape is moving in the play mode or in fast forward/stop modes. This mode is a popular feature on previous Fostex products. If the record mode is entered (by pressing the **RECORD** button and the **PLAY** button simultaneously) individual input monitor mode will be cancelled. When this mode is selected, the **INPUT MON** LED will blink slowly.



This is convenient when the operator in the control room would like to listen to comments from the musician(s) in the booth before starting the recording session.

2. Individual Input Monitor 2 (In Mon 2)

Individual input monitor 2 mode is entered in the same way as input monitor 1 (by pressing the **RECORD** button). Tracks entered into record ready status and input monitor modes will be maintained in such modes as fast forward/stop, but not during playback. When this mode is selected, the **INPUT MON** LED will blink quickly, (the individual input monitor mode is cancelled if the **RECORD** button is pressed again).



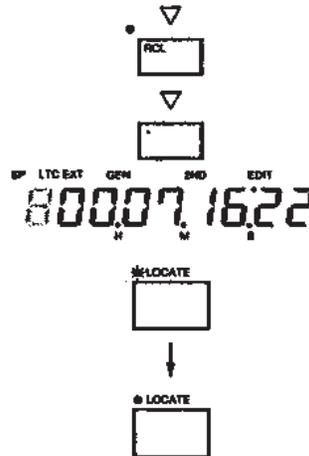
This is convenient when you wish to listen to any comments of the musician(s) in the booth after playback, and check on the recording taken without pressing the **RECORD** button again.

5) [RCL] → [·] (Recall of Last Play Point)

This function displays the last play point on the **MEMORY** display and the editing of its contents. "Last play point" is the last point where G24S/G16S had entered playback from the stop mode, and this point is automatically re-entered in the memory each time the G24S/G16S enters the playback mode; however, the point where play is entered by auto play or the point where play is entered by pressing the **PLAY** button without pressing the **STOP** button (during fast forward, rewind, etc.) will not be accepted as the last play point. In other words, the "last play point" is the point where playback is entered by pressing the **PLAY** button after the stop mode has been entered by manually pressing the **STOP** button.

• Method of Display/Editing of Last Play Point

- (a) Press in order: **RCL** key, [·] key, and the last play point presently in the memory will be displayed as shown in the right-hand figure. The **LOCATE** LED will blink to indicate that locating is possible to this last play point.



- (b) If the last play point must be edited, re-enter time data using the numerical keypad in the same way as registering time data in the cue memory, then press in order : **STO** key, [·] key. The new last play point just registered will be battery backed up even though the main power is turned OFF.



6) [RCL] → [LOCATE] (Recall of Location Memory)

This function displays, on the **MEMORY** display, the present value in the locate memory. As the locate memory is used for storing the time data for the location point of the last locate operation, it is separate from the cue memory, (and is automatically rewritten with the new value each time "locate" is carried out).

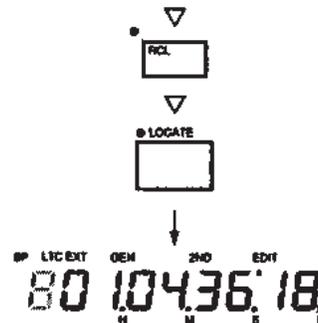
When locating to the same position as the previous locate operation, it is only necessary to directly press the **LOCATE** key without recalling the cue memory.

• Methods of Location Assignment

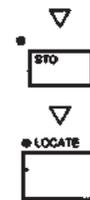
- | | | | | |
|---|------------------|----|-------------|------------------------------|
| (a) Entering by use of numerical keypad..... | CLR | → | 0 ~ 9 | } STO → LOCATE |
| (b) Recalling of cue memory | RCL | → | 0 ~ 9 | |
| (c) Operating by use of HOLD key | PLAY mode | >> | HOLD | |

• The Method for Displaying/Changing Locate Memory

- (a) When the **RCL** key and **LOCATE** key are pressed in order, any values presently stored in the locate memory will be shown on the **MEMORY** display.



- (b) After this value is rewritten and the **STO** key and **LOCATE** key are pressed in order, the new time data will be registered in the locate memory (method of re-writing is the same as for cue memory). The value registered here will be battery backed up even though the main power is switched OFF.

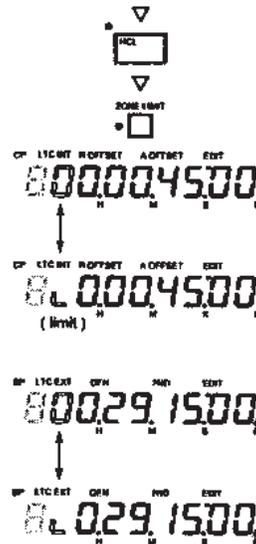


7) [RCL] → [ZONE LIMIT] (Setup of Zone Limit Section)

This function displays the presently setup zone limit section on the **TAPE TIME** display and **MEMORY** display, and can be used to change its contents.

• Method of Display/Setup of Zone Limit Section

(a) When the **RCL** key and **ZONE LIMIT** button are pressed in order, the presently set zone limit section will be displayed on the **TAPE TIME** display and **MEMORY** display as shown in the right-hand figure: In this example the zone limit section, with the takeup side (start of winding side) set at 45 seconds on the **TAPE TIME** display, and the supply side (end of winding side) set at 29 minutes and 15 seconds on the **MEMORY** display, are presently stored in the memory. Under these conditions, "L" will alternately light to indicate the zone limit (left end).

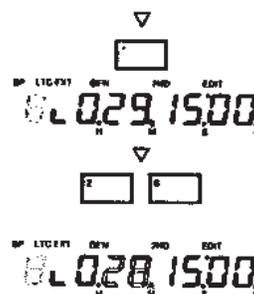


When the **ZONE LIMIT** button is pressed to enter the zone limit function, the **ZONE LIMIT** LED, will light if the present tape position is 50seconds, and blink if it is 29 minutes 20 seconds.



Supply reel side (left side)

(b) To change this setting, either shift the **MEMORY** display cursor by pressing the [·] key and enter the new value desired using the keypad, or, after clearing the **MEMORY** display by pressing the **CLR** key, enter the new value using the keypad (the same as for time data registering in cue memory). In the following example, the supply side is changed from 29 minutes to 28 minutes.



Take up reel side (right side)

- (c) Next, press the **HOLD** key for the purpose of changing the value of the **TAPE TIME** display (takeup side). The present value shown on the **TAPE TIME** display and the value shown on the **MEMORY** display will be exchanged. Now you can change the value by using the on the previous page step (b) (moving cursor). In the following example the takeup side value is changed from 45 seconds to 25 seconds.



- (d) After entering both zone values, press in order : **STO** key, **ZONE LIMIT** button. The new zone limit section has now been setup (previously entered data will be battery backed up even after switching the main power OFF).



- (e) To exit from the zone limit section display/setup mode, press either the **STO** key or **RCL** key twice.

Automatic Calculation of the Zone Limit Section

In addition to the above zone limit section setup procedures by using the numerical keypad, the G24S/G16S also has the ability to set these limits by automatic calculation. This method is very useful as it will set the zone limit section by calculating the standardly used beginning and end positions of the tape. Operating procedures are as follows:

1. While in the play mode, press the **ZONE LIMIT** button while pressing the **PLAY** button to initiate automatic calculation of the zone limit section.
2. The left end number of **TAPE TIME** display will alternately light with the letter " **Q** " to indicate that G16 is in the automatic calculation mode.
3. Upon completing the calculation, the alternate lighting " **Q** " will stop and the **ZONE LIMIT LED** will light or blink to indicate the tape position at that instant (it will automatically enter the zone limit function). After calculating is completed press the **STOP** button to stop tape.

NOTE

Results of automatic calculation of the zone limit section will be affected by tape base thickness, setup value and setup of reel size (refer to "2nd mode function"). If the zone limit function does not work properly after automatic calculation, check these setups.

8) [RCL] → [AUTO PLAY] (Display of Remaining Tape Time)

This function displays, on the MEMORY display, the remaining time from the present position of the tape to the end point of the zone limit section. As this can be displayed even when the G16 is in the play mode, it is a convenient feature when the remaining time of the tape is short.

9) [RCL] → [HOLD] (Display of Zone Limit Section Length)

This function displays the zone limit section length (time value) on the MEMORY Display. When the zone limit is functioning, record and playback modes are possible for the time length displayed here.

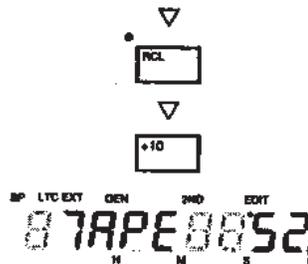
10) [RCL] → [+10] (Setting the Tape Base Thickness)

This function enters the base thickness of the tape in use (for automatic calculation of the zone limit) and is helpful if the following problem occurs:

The tape still runs beyond the zone limit contrary to expectation (off the reel). Improper tape base thickness can be one of the causes. In this case, change the base thickness data using the function explained below:

• Method for Entering the Base Thickness

- (a) Press in order: RCL key, +10 key. The value of the base thickness registered in the memory, such as "Tape 52", will be shown on the MEMORY display (the base thickness of this example is 52 microns).



- (b) To enter the new base thickness within the 20 ~ 99 range, use the numerical keypad (error will be indicated if a value outside this range is input). Make the value larger if the tape runs beyond the zone limit; make it smaller if the zone limit range is too narrow.

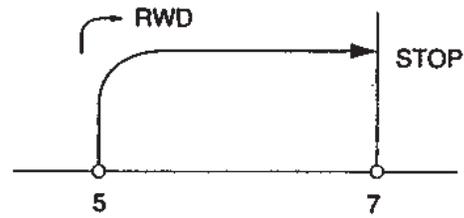
- (c) When the STO Key and +10 Key are pressed in order, the value displayed in step 2 above will be registered. The contents registered here will be battery backed up even if the main power is switched OFF.



*** Default value (initial value at shipping from plant), is 52.

11) [RCL] → [AUTO RTN] (Setup of Auto Return Memory)

Auto Return Memory is composed of two points of time data, the starting point and the objective point, using the cue memory. This function indicates on the **MEMORY** display the presently registered auto return memory contents and also allows changes in these contents to be made.

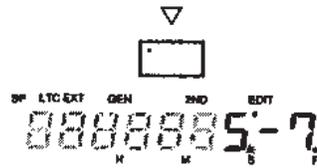


• Method for Display/Store of Auto Return Memory

(a) When the **RCL** key and **AUTO RTN** key are pressed in order, the present auto return memory content will be displayed on the **MEMORY** display as shown below. In this case 5, the starting point, and 7 the objective point, of the cue memory are stored.



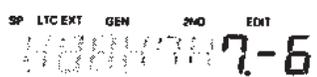
(b) To change this setting, press the [·] key, then move the cursor to the cue memory digit to be changed, and enter the desired cue memory number using the numerical keypad. In the following example cue memory 5 is changed to 6.



(c) To enter registration directly (not changing present data), first press the **CLR** key to clear the **MEMORY** display, then press n, -/PRE-ROLL, and m in order. In the following example which is the same as (b) above, enter 6 then -/PREROLL, and 7 in order.



(d) When the **STO** key is pressed, the size relationship of the time data in the two cue memories is automatically determined and sorted, with the smaller sizes going into the right side and the larger sizes into the left side. If the **AUTO RTN** key is then pressed, the auto return memory is rewritten accordingly. The contents registered here will be battery backed up even though the main power is switched OFF.



***This convenient shuttle repeat feature (continuously repeated playback) can be utilized when the auto return function is used in conjunction with the auto play function.

12) [RCL] → [−/PREROLL] (Setting of Preroll Time)

This function sets the preroll time. Preroll is the function of automatically stopping the tape at a prescribed length of time before the actual "locate" point when the G16 is in the locate function. The prescribed length of time (0 ~ 59sec.) is called the "preroll time".

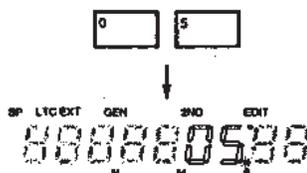
• Method of Setting the Preroll Time

(a) Press in order : **RCL** key, **−/PREROLL** key.

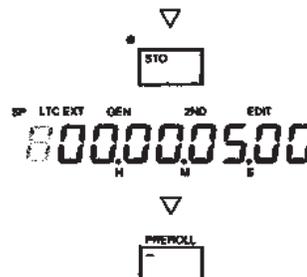
The preroll time presently set will be displayed on the **MEMORY** display. The following example shows a preroll time of 0 seconds.



(b) Enter the preroll time using the numerical keypad. Assuming it to be 5 seconds, press in order **0** and **5**. The range permitted for the setting of the preroll time is 0 ~ 59 seconds, and will be displayed as an error beyond this.



(c) Press the **STO** key and the **MEMORY** display will be changed. Next, press the **−/PREROLL** key and this value will be registered as the preroll time. Contents of this entry into the memory will be battery backed up even though the main power is switched OFF.



NOTE

When locating is accomplished with a set preroll time other than zero, the number at the left end and the letter "P" in the **TAPE TIME** display will be alternately shown to indicate that preroll time is other than zero seconds.

*** The actual stop point after completion of a locate function, can differ slightly from the objective point (approx. 0 ~ -0.25 seconds).

4. 2ND MODE FUNCTION

(1) Change of Initial Settings

The 2nd Mode function is provided to obtain maximum results from the G24S/G16S. Of the ten 2nd Mode functions, the following seven modes are built into the scan mode making it possible to make changes in various initial settings. You can set up the G24S/G16S to suit your own personal needs.

- **How to Enter the 2nd Mode**

While pressing the RCL key, press the STO key to enter the 2nd mode. "2nd." will be shown on the MEMORY display to indicate that the 2nd mode has been entered. In addition, the 2ND LED will light.



- **Continuous Recall Mode Using [·] Key**

For convenience in selecting modes 1 ~ 7 of the 2nd mode function, a continuous recall mode has been provided in addition to recalling by use of the numerical keypad. The [·] key is used for this purpose. Immediately after entering the 2nd mode (when "2nd." is displayed), the MEMORY display will list, in the following order, the 7 modes available, with each press of the [·] key.



- | | |
|---|-------------|
| 1. Display of version number | "VER 1.00" |
| ▽ | |
| 2. (a) Setup of reel diameter (takeup) | "r_T 114" |
| ▽ | |
| (b) Setup of reel diameter (supply) | "r_S 114" |
| ▽ | |
| 3. Setup of maximum speed | "MXSP 253" |
| ▽ | |
| 4. Cumulative play time | "PTM 0101" |
| ▽ | |
| 5. Setup of reel control | "rcnt_on" |
| ▽ | |
| 6. Setup of frame | "FrAME 30" |
| ▽ | |
| 7. Memory clear
(Returning to 1, 2,..rpt.) | "MEM _ CLr" |
| ▽ | |

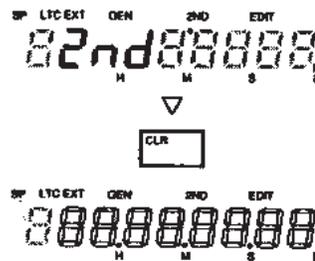


NOTE

The reel control setting cannot be changed with the continuous recall mode. The presently set figure, however, can be confirmed. If the setting must be changed, press in order: 9, 1, after entering the 2nd mode.

• **How to Exit from the 2nd Mode**

Press the CLR key to exit the 2nd mode and return to normal mode. The display of "2nd." will disappear indicating exit from the 2nd mode.

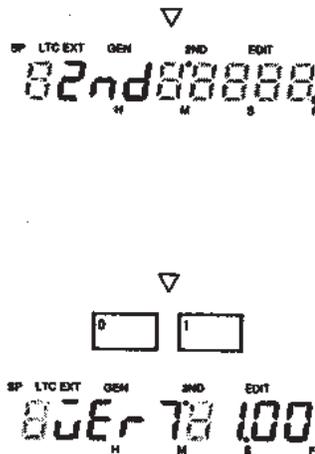


• **Selecting modes (1 ~ 7) using numerical keypad**

Explanations from here on will be made on the assumption that the 2nd mode has already been entered.

MODE 1 : 0, 1 (display of version)
"VER T 1.00"

"VER T 1.00" will be shown on the MEMORY display. This indicates the software version of Model G16.

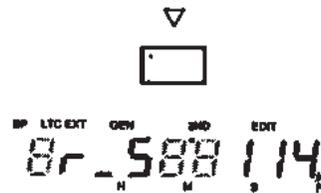


MODE 2 : 1, 1 (Setup of Reel Diameter)
"r _ T 114"

This will be displayed as "r _ T 114" on the MEMORY display (for automatic calculation of the zone limit). This indicates that the take up side reel hub inner diameter is registered at 114mm (10 inch reel/default value). This figure can be rewritten over the range of 40 ~ 255 by the numerical keypad (the 7 inch reel, for example, is 60mm). The setup value can be changed to this figure by pressing the STO key after entering the number (this will be battery backed up even though the main power is switched OFF).

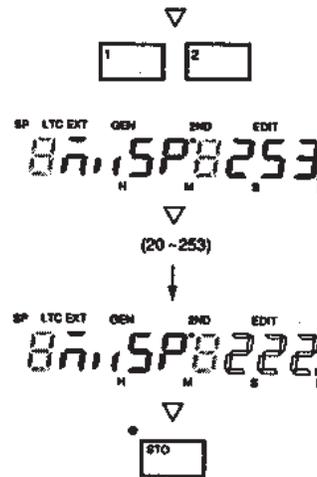


Next, press the [·] key. The display will change to "r _ S 114" (the T will change to S). This indicates that the supply side reel hub inner diameter is registered at 114mm (10 inch reel/default figure). This setup figure can also be changed by the same procedure as that of the takeup reel outlined above. The T (takeup) and S (supply) displays will alternate with each press of the [·] key.



MODE 3 : 1, 2 (setup of maximum speed)
"MXSP 253"

"MXSP 253" will be shown on the MEMORY display. This indicates that the presently set maximum speed is 253 (the default figure). Maximum speed is the upper limit parameter of the reel rotation speed. Fast forward/rewind rotation speed will become faster as this number becomes larger. This figure can be re-written over a range of 20 ~ 253 by using the numerical keypad. By pressing the STO key after key-in, the setting will be changed to the new figure (it will be battery backed up even though the main power is switched OFF).

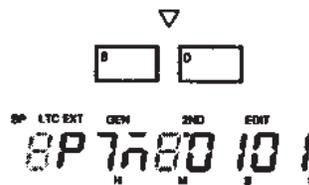


Note

If you set the recorder to 20 ~ 25, you can use this for the spooling function, i.e., "master winding", or tails out.

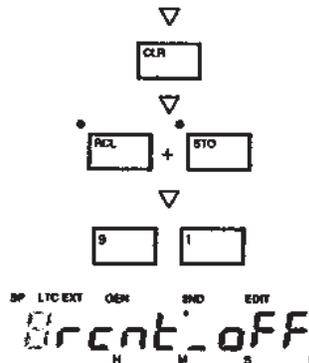
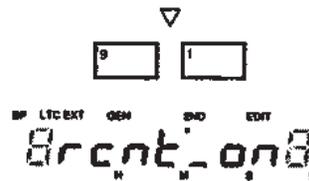
MODE 4 : 8,0 (Cumulative Play Time)
 "PTM 0101"

"PTM 0101" will be shown on the MEMORY display. This indicates the cumulative play time (in units of hours). This example indicates that, thus far, the G16 has played for 101 hours. This display can be used as a measure for judging when head replacement is necessary.



MODE 5 : 9,1 (Setup of Reel Control)
 "rcnt_on"

"rcnt_on" (Or OFF) will be shown on the MEMORY display. This indicates that the reel control function is presently ON (the default figure). Reel control functions to slow down the reel rotation speed when there is danger of tape winding off the reel during the fast forward/rewind mode. Each time this display is recalled, it will alternate between ON and OFF. This setting cannot be changed by using the numerical keypad.

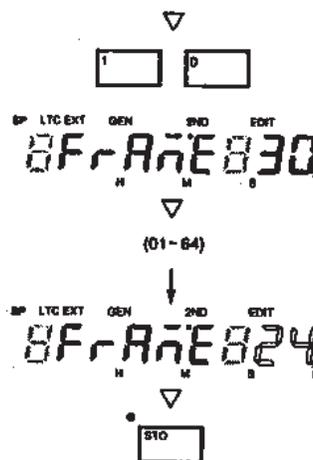


NOTE

This setting will not be backed up after switching OFF the main power. In other words, the recorder will return to "rcnt-on" whenever the power is switched OFF, and then ON.

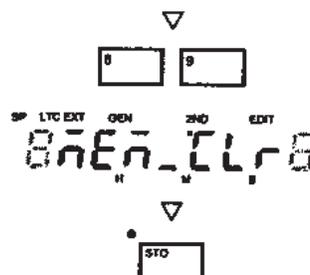
MODE 6 : 1, 0 (Frame Setup)
"FrAME 30"

This will be displayed on the **MEMORY** display as "FrAME 30". This indicates that the present time value acknowledged is a "one second=30 frames" conversion (the default figure). This figure can be re-written by using the numerical keypad within a range of 01~64. After entering the new value, press the **STO** key and the setting will be changed to this figure (this will be battery backed up even though the main power is switched OFF). Notice, however, that drop frame cannot be processed. If it is set to 01, the frame digit number when the tape is played will be fixed at "00". Also, when time data is to be edited by the trim mode, even though the frame digit is specified by a 2 digit trim, the "second" digit will be increased/decreased.



MODE 7 : 8, 9 (Memory Clear)
"MEM _ CLr"

"MEM _ CLr" will be shown on the **MEMORY** display. This indicates that the G16 has entered the memory clear mode (the memory will not have been cleared at this stage). Following this, pressing the **STO** key will clear 0 ~ 9 of the cue memory, locate memory, zone limit section, preroll time and auto return memory, returning them to the initial figures set at the factory.



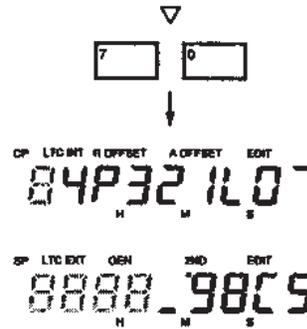
NOTE

In order to return all settings to initial figures set at the factory, (including above memories) switch the power ON while pressing and holding the front panel **■** button and **▶** button.

The following are three 2nd Mode functions which are not built into the scan mode.

(2) Sort Mode: (After entering 2nd Mode) 7, 0

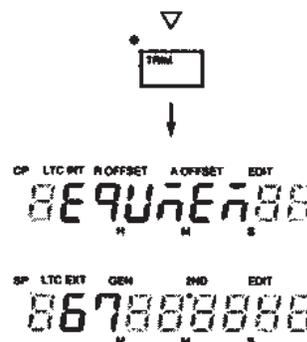
The **TAPE TIME** display and the **MEMORY** display indicate the size relationship of various time data in the memory of the G16. Identical time value, however, will not be displayed in regards to cue memory 0 ~ 9. In this a case, priority will be given to the smaller number for display. In this example, 6 and 7 will be the same value among 0 ~ 5. (Example: it could be 7 = 6 = 5 or 6 = 4 or 7 = 1, etc.)



Meaning of Display

- : zone of takeup side
- _ : zone of supply side
- 0 ~ 9 : cue memory 0 ~ 9
- P : last play point
- L : locate memory
- C : current time
(present position of tape)

The **TRIM** key is used to confirm which cue memory is of the same time value. As long as the **TRIM** key is pressed down, "EqUMEN", which means that the time data is equal to other cue memories, will appear on the **TAPE TIME** display. At the same time, its number "67" will be displayed on the **MEMORY** display. In this example, since cue memories "6" and "7" are the same value as other cue memories, it is indicating that it will not appear in the sort mode display.



During tape running, current time "C" will move on the display.



When the **STO** key is pressed while in the sort mode it will enter the direct locate mode (explained later).

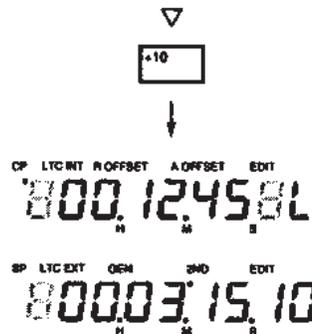
NOTE

The sort mode can also be entered without going through the 2nd Mode by pressing the **RCL** key and **CLR** key in order.

While in the sort mode, the following keys are pressed to display the time values of each memory on the **MEMORY** display.

- Supply Side Zone-/PREROLL Key
- Takeup Side Zone+/OFFSET Key
- Current TimeSAFE/RDY Key
- Cue Memory 0~90 ~ 9
- Locate Memory+10 Key
- Last Play Point[·] Key

Example: The time value of locate memory will display on the **MEMORY** display. Press the **+10** key. "L" of locate memory will display frame digit of current time on the **TAPE TIME** display.



To exit from the sort mode, press the **CLR** key.



(3) Direct Locate Mode: (After entering 2nd Mode) 7, 1 "dirLoc"

"dirLoc" will be displayed on the MEMORY display. At the same time, the STO LED will blink to indicate that it has entered the direct locate mode. Direct locate is the mode for locating a desired memory point in a single process, without going through multiple operations such as recalling the cue memory, then pressing the LOCATE key. When the following keys are pressed upon entering this mode, the G24S/G16S will immediately start locating to that point.

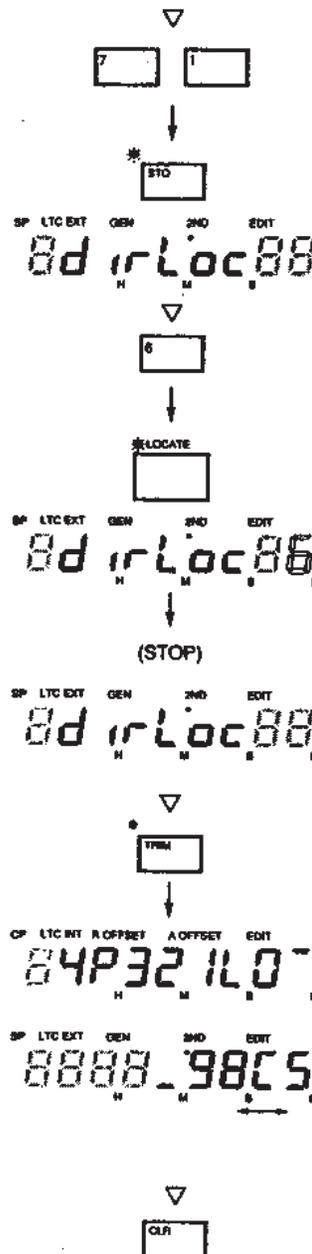
- Supply Side Zone-/PREROLL key
- Takeup Side Zone+/OFFSET key
- Cue Memory 0 ~ 90 ~ 9
- Locate Memory+10 key
- Last Play Point..... [·] key

During the direct locate operation, the destination point of direct locate will be displayed as "dir_Loc 6" at the right end of the MEMORY display (the display method is the same as for the sort mode). If the sort mode display is to be checked during the direct locate mode, use the TRIM key. As long as the TRIM key is held down, the TAPE TIME display and the MEMORY display will change to the sort mode indication. It will return to the direct locate mode indication when the TRIM key is released.

To exit from the direct locate mode, press the CLR key.

NOTE

It is possible to exit from the direct locate mode and enter the sort mode by pressing the STO key, while in the direct locate mode. STO LED will go OFF.

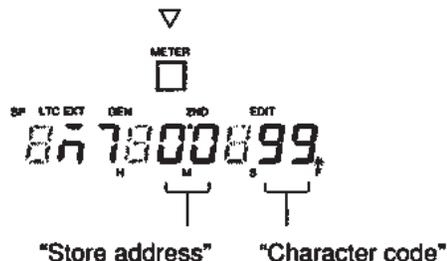


- **Review of the Sort Mode and Direct Locate Mode**

Sort and direct locate modes are closely related. For example, the display method of the locate destination during the direct locate operation is the same as that for the sort mode. The **STO** key is pressed once to shift from the sort mode to the direct locate mode. The **STO** key is also pressed once to do the reverse operation. Very efficient operation is possible by utilization of this jump feature as the sort and direct locate modes can be recalled without returning to the 2nd display.

(4) Meter Display Mode (After entering 2nd Mode) **METER**

This function displays, on the bargraph level meter, a (maximum) of 32 characters and numbers. In the following example, "00" is shown on the **MEMORY** display indicating the store address, and "99" on the right side (default figure) indicates there are no characters currently stored at this location.



Note

99 is the code indicating there are no characters(99= NOP: no operation).

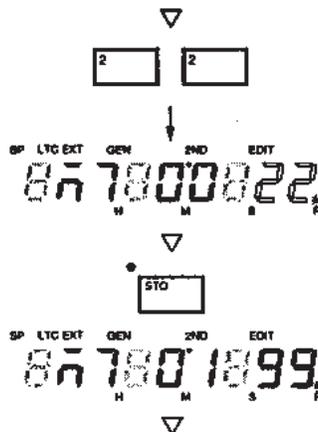
- **How to Enter Data**

(a) Example: to enter FOSTEX:

Refer to the character input code table to find that F=22, and then enter 22 into the store address 00.

Press **STO** key; the next store address will be 01.

(b) Repeat the process to enter: O=31, S=35, T=36, E=21, X=40, in order, pressing the **STO** key each time.



NOTE

99 is the default figure, and even if stored, it cannot be displayed. If data 98 is stored into store address 02 for example, and data 99 is stored into address 08, then addresses (characters) 03 thru 07 cannot be displayed.

- **Confirmation of Data Entered**

- (a) When you press the **RCL** key once, the store address will increase by one, and continues to increase as pressed.
- (b) If you press the **[·]** key once, the store address will decrease by one and continue to decrease as pressed.
- (c) If you press the **-/PREROLL** key the store address will return to 00.
- (d) If you press the **+ /OFFSET** key the store address will move to a new address where no data has been stored yet.

- **How to Display Data Entered**

- (a) If you press the **SAFE/RDY** key, the **METER** will display the characters or numbers entered.
- (b) If you press the **METER** button, the characters will be displayed in an endless looped sequence pattern to the left.

NOTE

Press the **TRIM** key to clear the characters displayed.

- **Changing the Peak Hold Time Setting**

The peak hold time setting can be changed by referring to the character input code table and entering either **81, 82, 83** (default figure is 80), and then pressing the **STO** key to store the setting in the address located at the end of all data. This is available only when the **METER** display is in the temporary mode. This new setting will be battery backed up even after the main power is turned OFF.

Example: to enter **81** → **STO**. The **METER** will display "PH1 SET".

NOTE

The peak hold time becomes longer as the numbers increase (**81, 82, etc.**), with the factory direct setting (**80**) being between **82 - 83**. By pressing the **HOLD** key, the current setting of hold time will be shown on the **METER** display.

Example: "PHn" (80 : normal).

REFERENCE SECTION

DISPLAY INDICATIONS

CHARACTER	0	1	2	3	4	5	6	7	8	9	A	b	C	c	d	E	F	G	H	i	J
DISPLAY	0	1	2	3	4	5	6	7	8	9	A	b	C	c	d	E	F	G	H	i	J
CHARACTER	K	L	l	M	n	o	P	q	r	S	T	t	U	u	V	W	X	y	-	-	-
DISPLAY	K	L	l	M	n	o	P	q	r	S	T	t	U	u	V	W	X	y	-	-	-

CHARACTER INPUT CODE TABLE

CHARACTER CODE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
DISPLAY	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	EN	A	B
CHARACTER CODE	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
DISPLAY	C	D	E	F	G	H	i	J	K	L	M	n	o	p	q	R	S	T	U
CHARACTER CODE	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
DISPLAY	V	W	X	Y	Z	d	r	s	z	_	EM	!	"	[]	.	'	(
CHARACTER CODE	57	58	59	60	61	62	63	80		81			82				83		
DISPLAY)	*	+	,	-	.	/	SET PHn		SET PH1			SET PH2				SET PH3		
CHARACTER CODE	98	99																	
DISPLAY																			

16 : EN Space 48 : EM Spaces 54 : Reserved 98,99 : Explained in the text

G24S/16S QUICK REFERENCE CHART OF COMMANDS

Command key	Function	Display	Key operation	Page
[n]	Cue memory recall		[·], [n], [CLR], [HOLD], [TRIM]	27
[PITCH]	Display of pitch control			28
[METER]	Selection of meter display		Select by [·]: normal/permanent/temporary/calibration	29
[INPUT MON]	Selecting individual input monitor		Select by [·]: 1/2	30
[·]	Recall of last play point		Same to the cue memory recall	31
[LOCATE]	Recall of location memory		Same to the cue memory recall	32
[RCL] → [ZONE LIMIT]	Set-up of zone limit section		[·], [n] (Automatic calculation: while PLAY mode, [PLAY]+[ZONE LIMIT])	33
[AUTO PLAY]	Display of remaining tape time			35
[HOLD]	Display of zone limit section length			35
[+10]	Setting the tape base thickness		Enter by [n] (20-99μ/default : 52)	35
[AUTO RTN]	Set-up of auto return memory		[·], [n]	36
[-PREROLL]	Setting of preroll time		Enter by [n] (0-59sec/default : 0)	37
[0] [1]	Display of version number			39
[1] [1]	Set-up of reel diameter (take up) Set-up of reel diameter (supply)			39
[1] [2]	Set-up of maximum speed		Enter by [n] (20-253/default : 253) Spooling mode : 20-25	40
[RCL] + [STO] [8] [0]	Cumulative play time			41
[9] [1]	Set-up of reel control ON/OFF		Switch the power on → "ON" (default)	41
[1] [0]	Set-up of frame		Enter by [n] (01-64 frame/default : 30)	42
[8] [9]	Memory clear		Execute by [STO], All initialize : [■]+[▶]+POWER ON	42

G24S/16S QUICK REFERENCE CHART OF COMMANDS

Command key		Function	Display	Key operation	Page
2nd mode	[7] [0]	Sort mode ↑ Change the mode by [STO] ↓	 	[RCL] + [CLR], [TRIM]: Confirmation of the same time value Confirmation of memory [-] : Zone limit (S) [+] : Zone limit (T) [SAFE/RDY] : Current time [n] : Cue memory [+10] : Locate memory [-] : Last play point	43
	[RCL] + [STO]	Direct locate mode		[TRIM] : Display of sort mode Execution of memory [-] : Zone limit (S) [+] : Zone limit (T) [n] : Cue memory [+10] : Locate memory [-] : Last play point	45
	[METER]	Meter display mode		Enter by [n], [STO] [RCL] : Increase the address [-] : Decrease the address [-] : Jump to the address "00" [+]: Jump to the last address of characters [SAFE/RDY] : Display the characters [METER] : Display the characters endlessly [TRIM] : Clear the characters	46
[TRIM]	Trim mode			[-], [+], [-] All digit & two digit trimming	27

ERROR INDICATIONS

Errors will be displayed on the TAPE TIME display and the MEMORY display when the G24S/G16S is not in normal condition or if an attempt is made to register various parameters beyond the permissible range. The various error indications are listed below:

1. "Error t": Appears on the TAPE TIME display.

This indicates a shut off error. Shut off error is the condition in which the transport cannot operate, such as slack in the loaded tape. In this case, the tape run count will be interrupted (registering of zone limit section, however, is possible in this state). The error indication will disappear when the tape is correctly loaded again.



2. "CAM Err": Appears on the MEMORY Display.

This represents a CAM error. CAM error indicates a condition in which the CAM drive system of the loading motor is not in a normal condition. The transport will be automatically stopped and all controls of the transport will shut off (all keys will become ineffective). The front panel button must be pressed for several seconds to exit this condition. This process allows the CAM drive circuit to activate again and return to its original state.



NOTE

Repair may be necessary if CAM error is displayed again after carrying out this process.

3. "Error n": Appears on the MEMORY display.

This display means an input error has been made; with "n" representing numbers 1-6 (error numbers). When registering certain values in a given memory the following error conditions may occur:

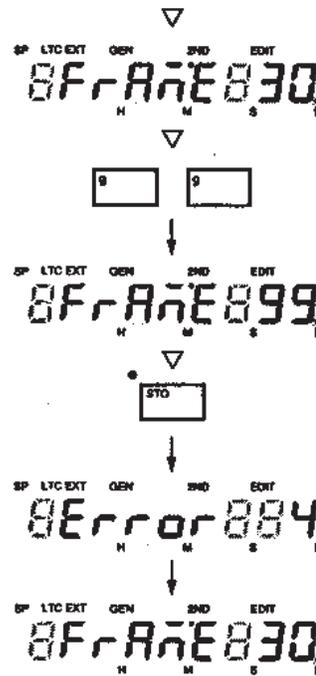
1. Value is unsuitable for preroll time.
2. MEMORY Display content is unsuitable.
3. TAPE TIME Display content is unsuitable.
4. Data is too large.
5. Data is too small.
6. Locate destination specified is beyond the calculating range.



"Error n", after displaying for approximately one second, will disappear. Certain types of data which caused this error will not be held.

- Example of data not held: Setup of frame (2nd Mode 10)

When in the frame setup mode, if you enter a number such as 99, which is too large an amount of data, and press the **STO** key, **MEMORY** display will show "Error 4" for approximately one second; the display will return to its status prior to entering any unsuitable data.



AMPLIFIER ADJUSTMENTS

Although record/playback amplifier adjustments are absolute requirements in obtaining total performance of the superior characteristics of the Dolby S system employed in G24S/G16S, these recorders are adjusted to the Ampex 456 tape and rigidly checked at shipment from the plant and therefore need not to be adjusted. If a different type tape is to be used, it can be readjusted by the following procedure.

"Reproduce" Amplifier Adjustment.

Tools: Test tapes - MRL Co., 41J326 or equivalent for G24S, FOSTEX Model 9200 for G16S; AC voltmeter; core aligning screwdriver.

- (1) Clean and demagnetize the heads, tape guides, etc.
- (2) Plug the AC voltmeter to output jack ⑤7 of the track to be adjusted.
- (3) Switch OFF the rear panel Dolby NR switch ⑥6 (all tracks off) and load the test tape.
- (4) Set all tracks in the playback mode.
: Press the **SAFE/RDY** key, then when the **CLR** key is pressed, all tracks will enter the safe mode. Cancel all input switch the **INPUT MON** switch and run the test tape.

Playback Level Setup.

- (5) Playback the test tape level set section (1kHz) and check the AC voltmeter for a -10dBv (0dB) indication. If adjusting is required, swing up the controller unit to reveal the trimmer pots.
- (6) Adjust the **NR OFF-REP LVL** trimmer for -10dBv readings of each track. Always use the special purpose screwdriver (oxide core aligner) for trimming. A correct reading on the AC voltmeter can not be expected by using a regular steel screwdrivers.

Playback Equalizer Setup.

- (7) This is checked by playback of the various frequencies of the test tape (-20dBv for G24S and -10dBv for G16S). If the level is largely offset, playback the 10kHz signal and adjust the **REP EQ** trimmer for a reading of -20dBv for G24S, and playback the 12.5kHz signal and adjust the **REP EQ** trimmer for a reading of -10.5dBv for G16S, on the AC voltmeter. This will result in an approximately flat playback response.

NOTE: Playback level for G24S, and playback level and playback equalizer for G16S can also be set by reading the bargraph meters switched to the Calibration Mode.
: [RCL] → [METER]

"Record" Amplifier Adjustment.

The recording amplifier is adjusted for record/playback frequency response (for record and playback) with the noise reduction system switched ON.

Tools: Blank tape for adjusting, precision oscillator, AC voltmeter, core aligning screwdriver.

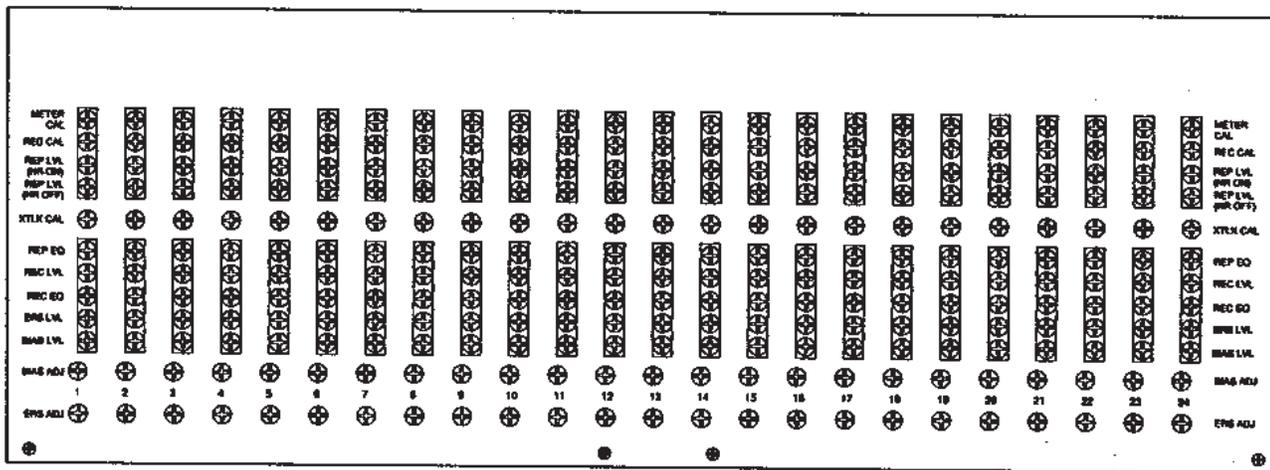
- (1) Upon completing adjustment of the playback amplifier, load the blank tape for adjusting on the recorder.
- (2) Put all tracks into Record Ready status.
- (3) Switch ON the Dolby NR switch (all tracks ON).

Recording Level Setup.

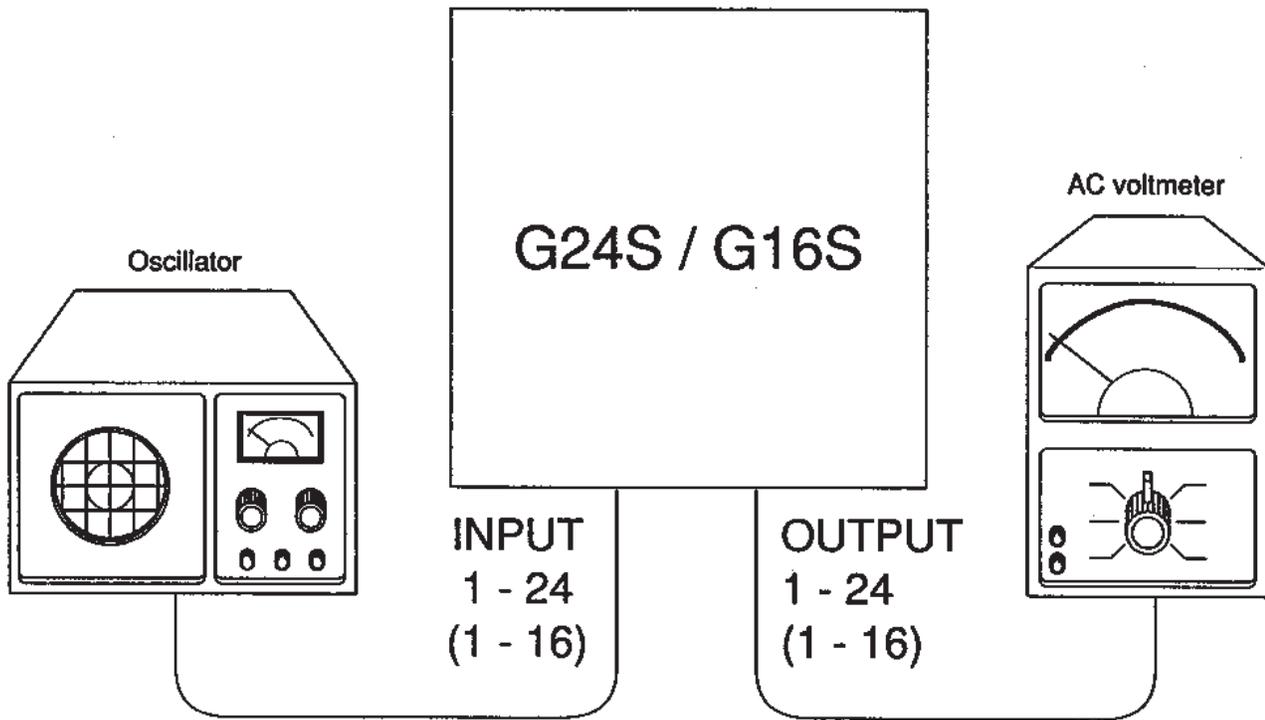
- (4) Set the precision oscillator output to 1kHz/-35dBv and apply it to the **INPUT** jack ⑤ of the track to be adjusted. Then adjust output of the precision oscillator for -35dBv on the AC voltmeter.
- (5) Record the 1kHz tone and adjust the **REC LVL** trimmer so that the playback level is -35dBv \pm 0. 5dB.

Recording Equalizer Setup.

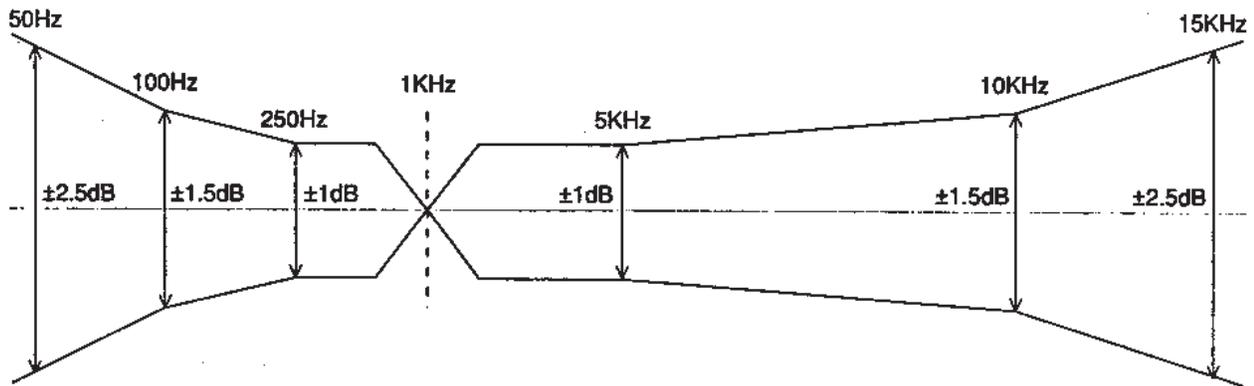
- (6) Vary the precision oscillator frequency and record 50/ 100/ 250/ 5,000/ 10,000/ 15,000Hz signals, then check that the response is within that shown in the figure "Record frequency response level" with respect to the playback level of 1kHz.
- (7) Check the frequency response and if it is not within specification, adjust the **REC EQ** trimmer.



Trimmer location map



Connecting diagram



Record frequency response level

MAINTENANCE

Cleaning

As a matter of physics, some magnetic particles are always deposited on the heads and tape guides. Playback characteristics will drop drastically when these magnetic particles build up on the head and guide surfaces. To prevent this problem, the heads and guides should be cleaned frequently with cotton swabs or a cloth moistened with head cleaning fluid. Should the magnetic particles collect on the capstan and pinch roller, the tape could slip between them and deteriorate tape transporting characteristics. They should be carefully cleaned in the same manner as the heads.

NOTE

Proper cleaning fluids and dehydrated alcohol must be used for cleaning. **DO NOT** use organic solvents such as lacquer thinners. They could damage the head and plastic surfaces. **Be certain you use rubber cleaner on the pinch roller; do not use head cleaner!** Do not use any silicone or teflon based cleaners on the pinch roller as they will over-lubricate the pinch roller and increase wow and flutter.

Demagnetizing

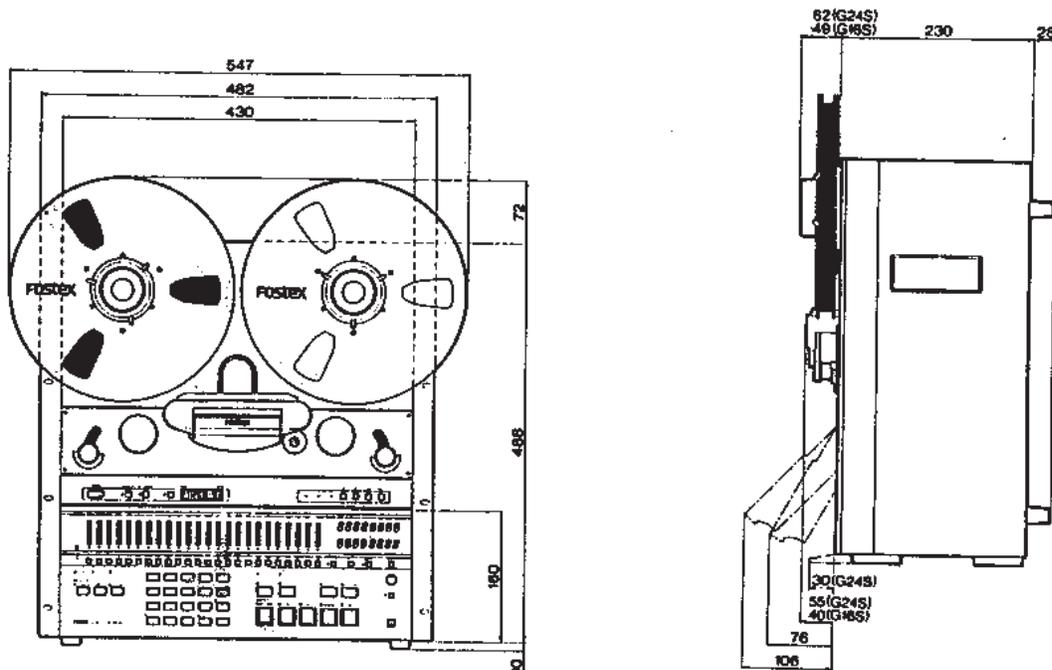
Recording and playback heads become magnetized by electrical disturbances in the amplifier or misoperation and long hours of use. Because of this, deterioration of frequency response and an increase in distortion will occur and sometimes induce noise in the tape. To prevent such problems, scheduled routine demagnetizing is strongly recommended. During demagnetizing, not only the heads but metal pieces in the tape path must also be demagnetized. Use a head demagnetizer for this operation. **Make certain the recorder is turned off when using any head demagnetizer!**

SPECIFICATIONS

In items with double specifications, the former is for G24S and the latter for G16S.

Tape	1 inch (25.4mm)/1/2 inch (12.7mm)
Track Format	24-track 24 channel/16-track 16 channel
Reel Diameter	#26 (10 inches)
Tape Speed	15ips (38cm/sec.), $\pm 0.2\%$
Pitch Control	$\pm 12\%$
Line Input	-10dBv (0.3V), impedance: 30k Ω , unbalanced
Line Output	-10dBv (0.3V), load impedance: 10k Ω or higher, unbalanced
Equalizer	$\infty +35\mu\text{sec}$
Recording Level	320nwb/m
Wow Flutter	$\pm 0.05\%$ peak (IEC/ANSI), weighted for 38cm/sec.
Start up time	Less than 0.5 seconds
Fast Forward time	Less than 140 seconds (for 740m tape)
Frequency Response	40Hz - 18KHz, $\pm 3\text{dB}$ (38cm/sec.)
S/N ratio	88dB/86dB CCIR ARM weighted at 15ips, referenced to 3% T.H.D level at 1kHz
T.H.D.	Less than 1% (1KHz)
Erasure	Better than 70dB (1KHz)
Crosstalk	Better than 55dB (1KHz)
Power	120V AC, 60Hz, 195W/170W 220V AC, 50Hz, 195W/170W 240V AC, 50Hz, 195W/170W
Physical dimensions	482(W) x 488(H) x 230(D) (mm)
Weight	35kg/32.5Kg.

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ACCESSORIES

The following accessories are packed with G24S/G16S:

Content	Amount
Empty reel	1
Warranty card	1
Owner's Manual	1

OPTIONS

Following options are separately sold for G24S/G16S.

- Model 8151 Foot switch
- Model 8546 Extension cable (for controller, w/dress panel)
- Model 8545 Synchronizer cable (Anti-EMI connector on one end)
- Model 8547 Synchronizer cable (Anti-EMI connector on both ends)
- Model 8330 Synchronizer card (installed inside main unit)
- Model 9084 Console rack

- Model 8041~3 4 channel color cables (RCA-RCA)
- Model 8044~5 8 channel color cables (RCA-RCA)
- Model 8046~8 8 channel color cables (RCA-PHONE)

Fostex

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