

**Fostex**

G-SERIES SYNCHRONIZER CARD

**Model 8330**

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**Operation Manual**



## INTRODUCTION

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We appreciate your purchase of the Fostex Model 8330.

The Model 8330 is a synchronizer card for installation in the 16 channel multitrack recorder, Model G16. Containing an LTC generator and two channels of LTC readers, a synchronized system centered around the Model G16 can be made very easily. In addition, as it contains a MIDI interface, it is possible to communicate with external MIDI equipment.

It is recommended here that you read through this manual for full utilization of its features and thus long years of satisfactory performance.

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Δ For better understanding of the product .....

This product is to be installed inside the Model G16. Consequently, it is operated from the Model G16 control panel.

This manual is compiled on the assumption that the reader has full knowledge of the Model G16. Duplicated sections have thus been omitted. If necessary, please refer to the Model G16 Manual on these sections.

Δ For persons who use the synchronizer for the first time .....

It is recommended first to read Chapter 4. The synchronizer. Then, you will be able to fully use the many functions of the Model 8330.

Δ Utilizing the quick reference charts .....

"Quick reference charts" of the 2nd mode function and MIDI message index with pages (indicated by \*\* in the Table of Contents) are to be referred to for quick reference.

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## 1. OUTLINE OF PRODUCT (Functions and features)

NOTE: This synchronizer card is designed exclusively for Model G16. It cannot be installed in any other recorder.

In this manual, explanations will be assuming the Model G16, installed with Model 8330, will be used as the slave.

- A synchronized system using the SMPTE time code (hereafter written LTC = Longitudinal Time Code) can be built by simply connecting an ATR or VTR which is to be the master. Such a system can be readily built using a single pin cord if a recorder such as a Model D20 complying to time codes which can output LTC even in the FF/RWD mode, is used for the master.

- Because it contains a 2 channel LTC reader, the Model G16 can be controlled to run in sync with the master by applying a sync pulse or LTC from an external equipment which is to be the master, and LTC recorded on the Model G16 tape.

- As it contains a MIDI interface, Model G16 can be controlled by MIDI commands approximately compatible with the Model MTC-1\*, and information on its operating conditions and tape positions can be output.

\* MTC-1: This is a MIDI interface unit which can be installed inside the 8 channel multitrack recorder Model R8.

- LTC which has been read in can be converted to MIDI time code (hereafter called MTC) or direct time lock signal (hereafter called DTL signal\*), and output.

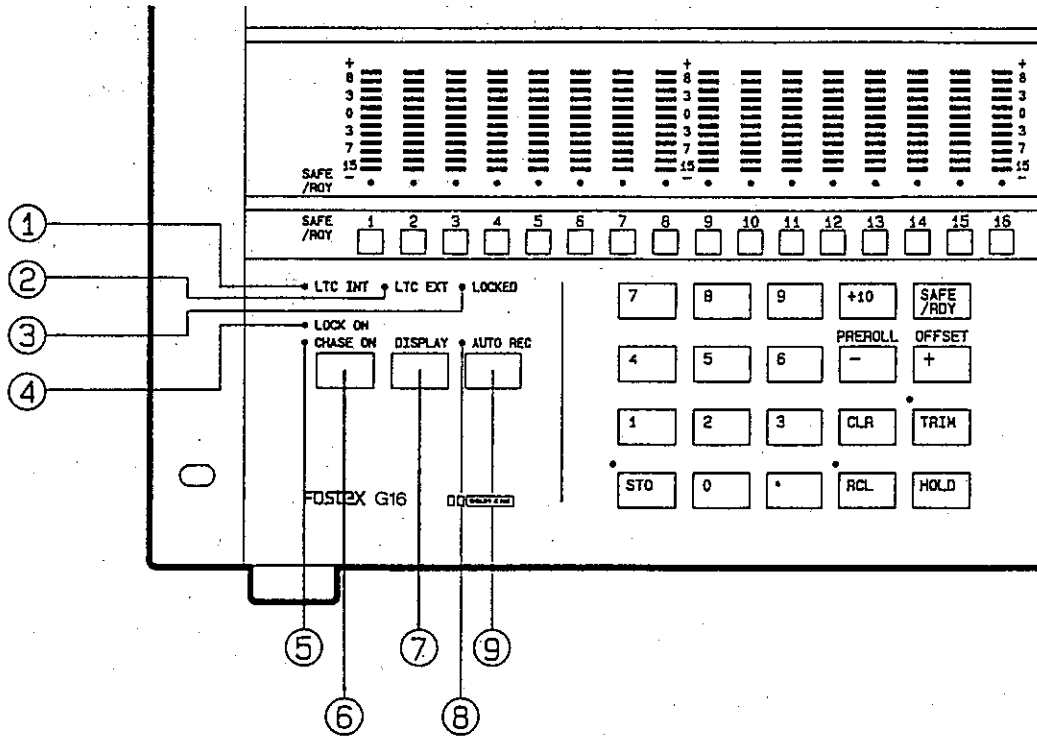
\* What is DTL signal .....

It is a synchronizing MIDI signal obtained by the LTC → MIDI conversion method employed by the Southworth Co. In the sequence software "Performer" for MacIntosh by Mark of Unicorn Co. There is some equipment which comply to this signal. Actually, it is the input LTC converted to MTC full message equivalent and to a MIDI timing clock.

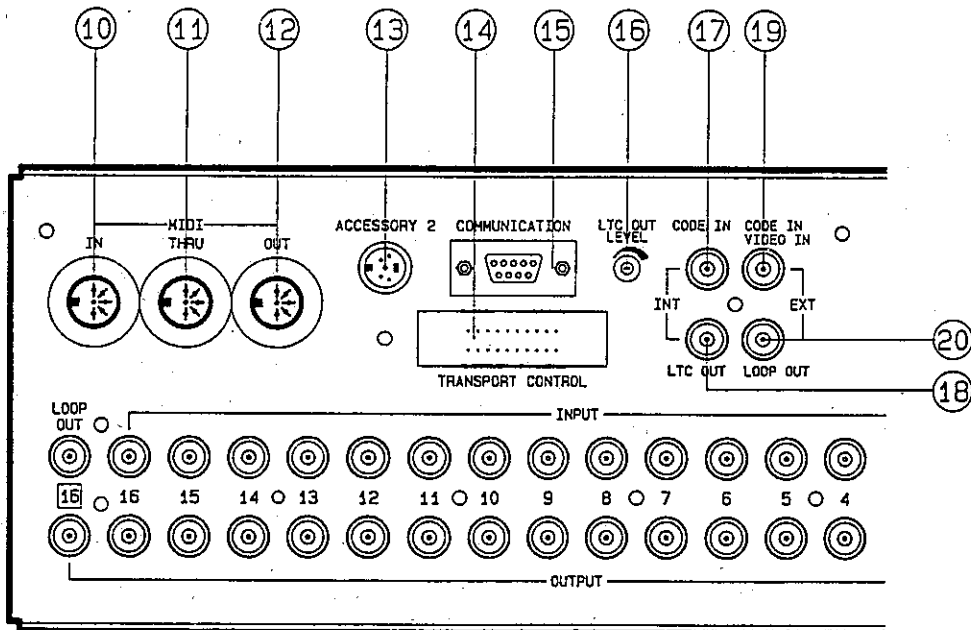
- A synchronized system between master recorder and MIDI slave can be simply built if the sequencer and sequence software comply to the MTC and, at the same time, contains a tempo map.

Installation: This unit, as a rule, will be installed at our Fostex Service Stations. For details, either inquire at your store of purchase or contact your nearest Fostex office.

Δ Model G16 Control panel



Δ Model G16 Rear panel





## 2. NAMES AND FUNCTION OF THE CONTROLS

Buttons and indicators, in the option key area of the Model G16 control panel and the rear panel additional terminals, which become effective by addition of Model 8330, will be explained in the following.

- Refer to Model G16 Owners Manual for explanation of other buttons.
- In the following explanations, buttons (keys) will be bracketed by [ ], LED indicators by << >> and others by { }. Characters inside the brackets are panel lettering of the functions.

Examples: [CHASE ON] : Chase on button  
<<LOCKED>> : Lock indicator  
{MIDI IN} : MIDI IN connector

- LED indicators will be indicated as follows.

\* : Lighted  
\* : Blinking  
O : Extinguished

- If there is a key with two meanings such as [+ / OFFSET], three different expressions such as [+ / OFFSET], [+] and [OFFSET] will be used but they all refer to the same key.

### CONTROL PANEL

#### (1) Internal LTC indicator <<LTC INT>>

When the G16 time code is input, the various modes will be indicated as follows.

\* : When internal LTC is correctly input.  
\* : Under learning of tach pulse rate.  
O : When there is error in the internal LTC.

(2) External LTC indicator <<LTC EXT>>

When a sync signal, or in other words, a time code or sync pulse (SP) from the master recorder is input, the various modes will be indicated as follows.

\* : When external LTC or SP is correctly input.  
⊕ : Under learning of tach pulse rate.  
○ : When there is error in the external LTC.

(3) Lock indicator <<LOCKED>>

Indicates the lock condition of master and slave.

\* : When locked.  
⊕ : When relative offset (\*) becomes less than one frame.  
○ : When not locked.

\* Refer to 4-2-2. offset modify.

(4) Lock on indicator <<LOCK ON>>

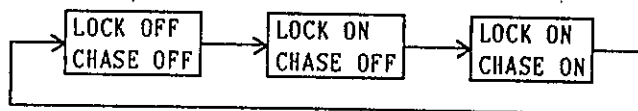
This will be lit when the lock enable mode is entered.

(5) Chase on indicator <<CHASE ON>>

This will be lit when entered in the chase enable on mode.

(6) Lock on/chase on button (Temporarily called [LOCK/CHASE])

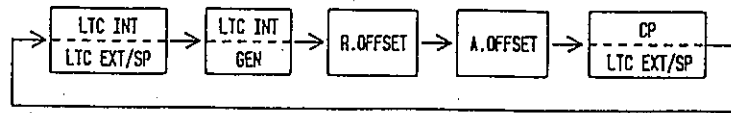
Lock mode and chase mode is switched ON/OFF by this button. The mode will change as follows with each press of this button.



- Both modes will be cancelled when the transport is shut off.
- When in lock, the indicator will change when this button is pressed but it will actually remain locked for about one second.

(7) Display button [DISPLAY]

This is for switching the time data display and will change with each press as follows (These are all time data.).



- Inside the box:

Content shown on upper display

Content shown on lower display

- When in the R.OFFSET (Relative Offset) and A.OFFSET (Absolute Offset) modes, both upper and lower displays are used to display one time data (sub-frame displayed on the lower display).
- Refer to DISPLAY AND ITS FUNCTION in page 11.

(8) Auto recording indicator <<AUTO REC>>

The display will appear in accordance to the following when the AUTO REC mode is entered by the auto recording button (9).

(Refer to "3-2. Auto Recording" for details.)

- \* : "Take" mode in the AUTO REC mode.
- ⊙ : "Rehearsal" mode in the AUTO REC mode.
- : Cancel of the AUTO REC mode.

(9) Auto recording button [AUTO REC]

ON/OFF of the AUTO REC mode is alternated with each pressing of this button. The present mode is shown by the auto recording indicator (8).

REAR PANEL

For details on various connectors, refer to connecting methods in 4-1. or 5-1.

(10) MIDI IN connector {MIDI IN}

This is connected to MIDI OUT of the MIDI equipment which is to control this unit.

(11) MIDI THRU connector {MIDI THRU}

Signals input to MIDI IN connector (10) is waveform shaped and output here.

(12) MIDI OUT connector {MIDI OUT}  
 Messages responding to MTC and MIDI equipments which control this unit are output here.

(13) Accessory 2 jack {ACCESSORY 2}  
 This auxiliary 4P jack outputs the following signals which can be used according to the requirement on hand.

Pin No.	Type of signal
1	GND
2	<<LOCKED>> output: +5V pull up; 10K $\Omega$ , low true
3	Reserved
4	Reserved

(14) Transport control connector {TRANSPORT CONTROL}  
 This is a 20 pin FC connector which is connected to the accessory and remote connectors of the recorder which is to be the master. Optional synchronizer cable Model 8540 and RCA pin cord set Model 8547 are available.

- When connecting other manufacturers ATR or VTR to the Transport Control connector, an exclusive interface may be required.

(15) Communication connector {COMMUNICATION}  
 This is a 9 pin D sub connector provided for the future.

(16) SMPTE time code output level control pot {GEN LEVEL}  
 This is for adjusting output level of LTC OUT (18). Since LTC OUT is common for both generator output and reader output, this pot also affects both outputs.  
 When this is used as the generator output, the level is ideally adjusted in the vicinity of 0dB with Dolby C ON for Model G16.

(17) SMPTE time code input jack {CODE IN} (INT)  
 The LTC input jack for Model G16 and output of the time code recorded track is connected (generally track 16).

(18) SMPTE time code output jack {LTC OUT} (INT)  
 The multi-purpose connector for time code generator output and time code reader output and are automatically switched in accordance to each mode as shown below.

- Generator output: Time code is output only when generator is in the free run mode. This is connected to the Model G16 INPUT for the track to which it is to be recorded (generally track 16).

- Reader output: As shown below, LTC indicating the present position of Model G16 will be output in other than the generator free run mode.

At PLAY : Signal from LTC input jack (17) will be waveform shaped and output.

At FF/RWD: Tape position based on the Model G16 tach pulse will be output in the form of LTC.

NOTE: Various modes are set by the 2nd mode explained later.  
(2nd [7] [2])

(19) SMPTE time code/composite video input jack {CODE IN/VIDEO IN} (EXT)

Time code output from the master to be used is connected here. Sync pulse and composite video signals can also be input as the reference signal.

(20) Loop out time code output jack {LOOP OUT} (EXT)

The signal input to the SMPTE time code/composite video input jack (19) is output here. It is convenient for splitting the signal to other equipments.

#### DISPLAY AND ITS FUNCTION

On the contents of {TAPE TIME DISPLAY} and {MEMORY DISPLAY}

The letters (LED) on the upper part of both displays will all become effective by addition of the Model 8330. The LED's will be lit as shown below at entering each mode.

#### {TAPE TIME DISPLAY} (Upper display)

```

CP LTC INT R OFFSET A OFFSET EDIT
  .
  8 8 8 8 8 8 8 8
    H      M      S      F

```

CP : Count pulse mode (Relative display)  
LTC INT : Display of internal LTC  
R.OFFSET : Display of relative offset  
A.OFFSET : Display of absolute offset  
EDIT : Edit mode

{MEMORY DISPLAY} (Lower display)

SP LTC EXT GEN 2ND EDIT  
• 00.00.00.00  
H M S F

SP : Sync pulse mode  
LTC EXT : Display of external LTC  
GEN : GEN mode  
2ND : 2nd mode  
EDIT : Edit mode

<Additional explanations>

• CP: The count pulse mode (relative display)

When Model 8330 is installed, time information is normally managed by LTC on the tape but to expand width in operation, time is also processed by the count pulse. When there is no LTC, 64 pulses are counted as one second, in the same way as in the basic Model G16 function but when LTC is input, it will be recalculated into its frame rate. In other words, it will be counted by calculating "what fraction of one frame is one pulse equal to?", Therefore, this is called "Relative display" to distinguish it from the conventional one.

- Count pulses effective upon the time axis are the following two keys. Locate operation can be simply entered without setup of cue points by LTC. (Operation is basically the same with the regular Model G16.)

[RESET] : Resets the relative display to "0." It is "0" at switch on of power.

[LOCATE 0] : Locates to the relative "0" position.

• Operation of [STO] → [HOLD]

When [STO] and [HOLD] are pressed in this order while in the edit mode, the lower display time data will be stored in the CP mode (relative display). Due to this, any desired time can be set in CP time. (CP time will be "0" at switch on of power.)

• SP: Sync pulse mode

This is a condition whereby LTC EXT is reading in the sync pulse. Sync pulse is a synchronizing signal which is used as an

alternative when there is no LTC. Such alternatives are video composite signals from a VTR and power line sync signals.

\*\* In the normal mode (at normal operation), the various display modes can be changed by the display button (7). In the 2nd and edit modes, explained later, displays exclusive to these modes will be shown.

### 3. CHANGES AND ADDITIONS IN MODEL G16 FUNCTIONS RESULTING BY INSTALLATION OF Model 8330

#### 3-1 Control keys whose operation have changed

Optional area keys were explained in the previous Section but operation of the following five keys, among the various control keys in Model G16, will be changed by installing Model 8330 in the Model G16 (Refer to Model G16 Owners Manual on conventional operation).

---

[HOLD]      [+10]      [RESET]      [LOCATE 0]      [+/OFFSET]

---

[HOLD]

Basic operation is same as conventional operation of Model G16 and [HOLD] is a function which can read in real time the time information as of the present time but is slightly different.

When this key is pressed, value of CP or LTC INT at that instant is held in the {TAPE TIME DISPLAY} (upper display), and SP or LTC EXT in the {MEMORY DISPLAY} (lower display). As the edit mode is entered at the same time and <<EDIT>> in the display will be lit, time editing procedure will be the same as at normal operation. However, since edit and store can be shown only in the lower display, it is necessary to exchange the upper and lower displays. In the edit mode, [HOLD] will take care of this and is exchanged with each press of this key.

\* The function of [STO] + [HOLD] is explained in Section 2 DISPLAY AND ITS FUNCTION (p. 11).

[+10]

This key is used, mainly with the numerical keys to specify the main track but the following functions have also been added. Time data will now be handled down to subframes (1/100th of a frame) and edited by the [+10] key. Refer to "3-4. Editing methods" for details.

[RESET]

When this button is pressed, CP (relative display) time will be reset regardless of what is on display. However, the various time memory content and LTC INT value will not change.



[LOCATE 0]	Will locate to the "0" time point of CP (relative display). * [RESET] and [LOCATE 0] functions are explained in Section 2 "Display and its function."
[+ / OFFSET]	This had been used only as the [+] key at data correction in the edit mode but it will additionally function as the offset key. For details, refer to "4-2-2. Offset modify."

### 3-2 Function of [RCL] → [?]

The function of [RCL] → [?] is to recall time data of the various memories and content of the various parameters, and is widely used for data confirmation and setup. Refer to the Model G16 Owners Manual for method of operation.

The basic operation of recalling the memory by [RCL] → [?], editing as required and then storing by [STO] → [?] has not changed. Operations that have changed and commands newly added are the following six.

Refer to "3-4. Editing methods" for changes in editing methods.

---

[RCL] → [AUTO RTN]	[RCL] → [AUTO REC]	[RCL] → [DISPLAY]
[RCL] → [- / PREROLL]	[RCL] → [+ / OFFSET]	[RCL] → [TRIM]

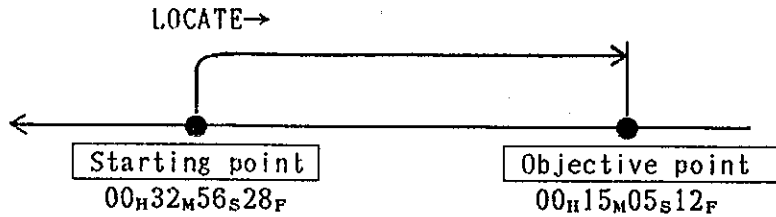
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[RCL] → [- / PREROLL]	<Recall and setup of preroll time> Setup was in second units (0 ~ 59 seconds) at individual use of Model G16 but it will now display all digits (00.00.05.00), the same as with other time data. In the setup procedure, it is also possible to edit all digits, just as it is for normal time editing. * Minus (-) preroll will be an error.
--------------------------	---

[RCL] → [AUTO RTN]	<Recall and setup of auto return memory> Heretofore, Model G16 itself handled the auto return point and its objective point by cue memory numbers (Example: 7. - 5.) As this will also be time display of all digits, and the objective point time will be shown in the {TAPE TIME DISPLAY} and, starting point time in the
-----------------------	--

{MEMORY DISPLAY}, they can be edited the same as with other time data. During display, the left hand number will be alternately lit with "L."

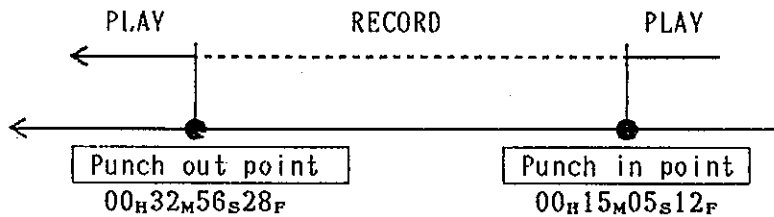
Example: [00.15.05.12.] ← [00.15.05.12.]  
 [00.32.56.28.] [00.32.56.28.]



[RCL] →  
 [AUTO REC]

<Recall and setup of auto recording memory>  
 Auto recording becomes possible by addition of Model 8330 and for this purpose, punch in and punch out points must be setup. When this command is executed, punch in point time and punch out point time can be edited as they will be displayed, respectively, in the {TAPE TIME DISPLAY} and {MEMORY DISPLAY}. During display, the left hand number will be alternately lit with "L."

Example: [00.15.05.12.] ← [00.15.05.12.]  
 [00.32.56.28.] [00.32.56.28.]



- When setting data for auto return and auto recording, it is possible to transmit data 0 ~ 9 from the cue memory.

After [RCL] → [AUTO RTN] or [RCL] → [AUTO REC], [RCL] → [n] is executed next.

~ Method of auto recording ~

- Preparation:
- (1) Setup the punch in/out points.
  - (2) Set record track selector to RDY.
  - (3) Check that tape is located before the punch in point.

<Rehearsal>

- (1) <<AUTO REC>> will blink when [AUTO REC] is pressed.
- (2) Transport is started by pressing [PLAY]. (PLAY mode)
- (3) <<INPUT MON>> starts blinking at the punch in point and be extinguished at the punch out point.
- (4) When [AUTO REC] is pressed again, <<AUTO REC>> will be extinguished and auto recording mode cancelled.

<Take>

- (1) <<AUTO REC>> will blink when [AUTO REC] is pressed.
- (2) Transport is started by pressing [REC] AND [PLAY]. (REC-PLAY mode). <<AUTO REC>> will change to steady light to indicate it is in "take."
- (3) <<REC>> will be lit at the punch in point and extinguished at the punch out point. <<AUTO REC>> will return to blinking.
- (4) When [AUTO REC] is pressed again, <<AUTO REC>> will be extinguished and auto recording mode is cancelled.

- EXPLANATION -

<<AUTO REC>> indicates that it is in the recording mode. When in this mode (during punch in/out) that channel is forced in the input monitor mode but the modes for the moment is indicated by <<INPUT MON>> for rehearsal and by <<REC>> for "take."

- Actually, after setting the preroll/postroll time and auto return memory, auto return and auto play functions are used in parallel. As a result, operation identical to the "loop operation," explained in Section 5., The MIDI Interface, becomes possible.

In other words, as rehearsal can be continuously repeated automatically, it can be entered in REC-PLAY when a satisfactory result is obtained.

- Absolutely the same can be done during lock.

[RCL] + [+ / OFFSET]	<Recall and setup of offset memory> Offset time will be displayed in the {MEMORY DISPLAY}. As there are several methods in setup of offset, refer to "4-2-2. Offset modify" for details.
-------------------------	---

[RCL] →  
[DISPLAY]

<Recall and setup of GEN start memory>  
LTC generator start time is setup.  
Refer to "4-2-1. 1) Recording of time code" for details.

[RCL] →  
[TRIM]

<Recall and setup of master time data>  
Time can be set freely when this command is executed as the master time will be held and the edit mode is entered. When a VTR or any other recorder which cannot record LTC is used for the master, it will use the video signal or other sync pulses for the sync signal but when these are input, the master will always start from time "0". Consequently, there will be occasions where it is desired to alter time of the master. Storing is executed by [STO] [TRIM].

- Explanation -

In the case of [HOLD] previously mentioned, time of both master and slave will be held. For example, suppose it is needed to match the picture and sound. After roughly matching the picture and sound, time of the master is set identical with the slave. This can be done by either holding the time by the [HOLD] key or stop the equipment at the correct point. Then, it can be accurately matched using offset trim explained later.

\* Refer to "4-2-2. Offset modify" for steps in offset trimming.

### 3-3 2nd mode function

Many 2nd modes have been added to extract maximum function from Model 8330. These are commands for executing the various functions and, for setting up and changing these parameters. These will now be explained below in proper order.

#### How to enter the 2nd mode

Press the [STO] key while pressing the [RCL] key. As this will display {2nd.} in the {MEMORY DISPLAY} to indicate that the 2nd mode has been entered, then if a two digit number is input from the numerical keypad, this will be shown on the display. As long as it is in the 2nd mode, <<2nd>> will be shown in the display.

#### How to escape from the 2nd mode

It will escape from the 2nd mode and return to the normal mode by pressing the [CLR] key and <<2nd>> will disappear.

- The following explanations will be on the assumption that the 2nd mode has already been entered.

NOTE: Please note that the following two functions originally possessed by Model G16 cannot be used if set to the 2nd mode "synchronizer ON." (Refer to "2nd [9] [0]")

---

2nd [7] [0]	Sort mode
2nd [7] [1]	Direct locate mode

---

- Operating pattern of the 2nd mode can be largely divided into the following three areas.

- - - \*\* Basic pattern of key operation \*\* - - - - -

- (1) 2nd [?] → Display (Confirmation)
  - (2) 2nd [?] → Display (Confirmation) → Select by [•] → Registered by [STO]
  - (3) 2nd [?] → Display (Confirmation) → Setup by [n] → Registered by [STO]
- - - - -

- When 2nd [?] is executed, default or the value setup in the previous stage will be displayed.
- Selection by [•] is the process of using the period key to set on/off of the various functions and, selecting the various modes and values for setup.
- Setup by [n] is the process of using the numerical keys to input numerical values within a certain range.
- In the explanations of each command, "Operation guides" are written inside the box in which key operation (key operation for entering the 2nd mode is omitted), setup items and values, actual displays, etc. are described. Default values (initial values) are attached with an (\*).

NOTE: A convenient "Quick chart of the 2nd modes" is given in the last page of this Section.

#### SYNCHRONIZER RELATED COMMANDS

[9] [0]  
SYNCHRO  
ON/OFF

##### <Synchronizer ON/OFF>

When set to synchronizer off, basically the functions of Model 8330 is lost and the recorder returns to the original Model G16 function. Consequently, keys and indicators in the optional key area will no longer function.

However, even though it is mistakenly set to "synchronizer OFF" while in chase ON or lock ON, sync operation will continue. This command must be executed again to maintain the synchronizer ON state. If not executed, all functions of Model 8330 will be lost at the instant lock is cancelled.

--- Operating guide -----

2nd [9] [0] [5 P n c o n ] : Synchronizer ON\*

↓

[CLR]

↓

2nd [9] [0] [5 P n c o f f ] : Synchronizer OFF

↓

[CLR]

-----

[2] [0]  
LOCK MODE

<Selecting the lock mode>  
It has the following three modes:

• Frame lock  
The bit representing LTC time data is read and locked by matching its value. At auto lock operation, phase correction is always carried out in this mode until it is locked.

• Sync lock  
This is the mode for synchronizing by the sync pulse regardless of the LTC frame address. For example, this mode is entered when the sync signal to be input is a video signal or any other type of sync pulse.

• Auto lock  
This will be in the frame lock mode until it positively locks on. After frame locking, it will automatically shift to the slow lock condition. Slow lock is similar to sync lock in which the frame content is also acknowledged. However, since servo reaction is not as fast as frame lock, it is less affected by drop out. The slow lock condition will continue until it transfers into an operating mode other than PLAY.

--- Operating guide -----  
2nd [2] [0]            [Lāđ RŮŦā]\*  
↓  
Select by [•]    [Lāđ FŦRā] : Frame lock  
                 [Lāđ RŮŦā] : Auto lock  
                 [Lāđ SPāC] : Sync lock  
                 [STO]  
-----

[1] [4]  
PARK & START

<Park area & start point of the slave: ON/OFF>  
This function is provided to allow starting the slave from its best condition by making the lock up time (time required until locking) as short as possible during the chase mode. For example, when the master is played, a play command is finally issued to the slave from Model 8330 after it reads the entire code from the master and thus create a time lag. Meanwhile, the master will have run ahead and to solve this problem, the idea is to advance the slave beforehand and wait.  
When this function is switched on, the slave in chase mode operates as follows.

- (1) Slave always stops to wait for the master.
- (2) As the master in play nears the parked (waiting) slave, the slave is started when the master arrives at a predetermined distance from the slave.
- (3) When the master is in the play mode and the slave approaches in the chase locate mode, the slave advances ahead of the master and stops temporarily.

If this function is switched off, the operation will be as follows.

- (1) When the master is stopped, the slave will also stop at the same point.
- (2) If the master is in play within the chase window, the slave will unconditionally enter in play.

Slave start point indicates when the slave should start as the master approaches.  
Slave park area indicates where the slave should park (wait) for most positive function of the "start point."

--- Operating guide -----

```

2nd [1] [4]      [PP.SP ON] *
  ↓
Select by [·]    [PP.SP OF] : OFF
  ↓
                [PP.SP ON] : ON
[STO]

```

[1] [5]  
PARK & START

<Park area and start point of slave: Setup>  
Park point (P.P) and start point (S.P) can be set in the range of 0 ~ 99 frames.  
Default is set to the ideal value for Model G16 (P.P = 20F, S.P = 10F).



--- Operating guide -----  
(When changing to S.P = 20F, P.P = 30F)

2nd [1] [5] [SP:0.PP.20.] : S.P=10F, P.P=20F\*  
↓  
[3] [0] [SP:0.PP.30.] : Change to P.P=30F  
↓  
[.] [SP:0.PP.30.]  
↓  
[2] [0] [SP.20.PP.30] : Change to S.P=20F  
↓  
[STO]

[5] [2]  
TACH PULSE  
RELEARNING

\* "." indicates a blinking dot.

<Relearning of relation between tach pulse and LTC>

First learning of the rate for tach pulse and LTC can always be carried out after switch on of power by using this command. This is convenient such as when tape is changed.

--- Operating guide -----

2nd [5] [2] [TRCLEARN]

↓  
Execute by [STO]

↓  
Enter master and slave in PLAY mode.

[2] [1]  
DIRECTION

<Mode setup for direction signal>

Tape travel direction is normally determined by the direction signal but whether this signal should be used or ignored can be setup. When it is ignored, it is determined by the FF/RWD tally signal.

NOTE: When using the Sony VO Series, BVU Series and BVW Series as the master, any difference between the display indication and actual tape position will be smaller if this command is used to set them in the direction signal ignoring mode.

--- Operating guide ---

2nd [2] [1] [E d i r d i r]\*

↓  
Select by [•] [E d i r d i r]: Use DIR signal  
↓ [E d i r t l p]: Ignore DIR  
[STO] sig. (FF/RWD tally)

[2] [3]  
SLAVE WAIT

<Slave wait mode>

In this mode, if the slave in chase mode is located ahead of the master, it will stop to wait for the master.

--- Operating guide ---

2nd [2] [3] [S \_ B A T a F] \*

↓  
Select by [•] [S \_ B A T o n] : ON  
↓ [S \_ B A T a F] : OFF  
[STO]

[1] [8]  
CHASE WINDOW

<Setup of the chase window>

In the chase mode, if the slave departs farther than a certain value from the master, it enters the locate mode and travels toward the master position in the fast wind mode. This value can be set within the 1 ~ 9 second range. (Default is 4 seconds.)

--- Operating guide ---

2nd [1] [8] [C \_ B . n d 4] \*

↓  
[6] [C \_ B . n d 5]  
↓  
[STO]

[0] [2]  
MACHINE  
SELECT

<Machine select mode>

Equipment connected to the master (EXT) is selected by this command.  
In the case of Model D20, it is matched to its exclusive position. Others should all be set to "normal."

--- Operating guide -----

2nd [0] [2]            [ARC 000] \*  
↓  
Select by [•]        [ARC 000] : Normal  
↓                    [ARC 020] : Model D20  
[STO]

[1] [7]  
LOCK DAMPING

<Setup of lock damping factor>  
Lock damping factor is the recorder response characteristic against the Model 8330 servo control output at lockup. As the slave is Model G16, it is designed so that it will be at the best value but this command is provided to allow changing it in accordance to the situation. It can be set in the range of 0 ~ 9.

--- Operating guide (For setup to "3") -----

2nd [1] [7]            [LOCKDAMP 0] \*  
↓  
[3]                    [LOCKDAMP 3]  
↓  
[STO]

[2] [5]  
CODE ONLY  
MASTER

<Code only master mode>  
When in the memory initialize condition, LTC EXT is read by triggering from the master play tally signal. Therefore, this mode is set "on" if only LTC is to be input with nothing connected to the transport control port.

--- Operating guide -----

2nd [2] [5]            [COARS OF] \*  
↓  
Select by [•]        [COARS ON] : ON  
↓                    [COARS OF] : OFF  
[STO]

[2] [6]  
MASTER  
CONTROL

<Master control>  
Model G16 transport control buttons can be switched over for master controlling while in the chase mode. This is on condition that the master and transport control port of Model 8330 is connected with the 20P cable.

\* Exclusive interfaces may be required when using ATR's and VTR's of other manufacturers.

--- Operating guide ---

2nd [2] [6] [CHSAC OF] \*  
↓  
Select by [•] [CHSAC ON] : ON  
↓ [CHSAC OF] : OFF  
[STO]

[2] [7]  
NO TACH  
PULSE

<No tach pulse mode>  
This mode is set "on" if the master in FF/RWD can output the tape position by LTC. (Models D20, G16 + 8330, 4011, etc.)

--- Operating guide ---

2nd [2] [7] [NO TP OF] \*  
↓  
Select by [•] [NO TP ON] : ON  
↓ [NO TP OF] : OFF  
[STO]

Time code related commands

[8] [1]  
TAPE SPEED

<Display of tape speed>  
Present tape speed of Model G16 is displayed as "The LTC speed that has been input is so many times that of standard speed."  
LTC INT and LTC EXT tape speeds are switched and displayed. (Standard speed is displayed as 1.00.)

--- Operating guide ---

2nd [8] [1] [.SPd 1.00] \*  
↓  
Select by [•] [.SPd 1.00] : LTC INT  
↓ [ESPd 1.00] : LTC EXT  
[CLR]  
( [?SPd ---] : Error or no input)

[2] [4]  
CODE MODE

<Setup of code mode>

This is setup in accordance to the type of sync signal output from the master. The following four modes are available.

- LTC
- VP: Vertical sync pulse of a video signal.
- P1 (x1 pulse): One pulse is counted as one frame.
- P2 (x2 pulse): Two pulse is counted as one frame.

(For example, 30F can be generated from the 60Hz power line sync)

--- Operating guide ---

```
2nd [2] [4]      [Cod LTC ] *  
↓  
Select by [•] --- [Cod LTC ] : LTC  
↓  
[STO]           [Cod VP ] : VP  
                [Cod PLS1] : P1  
                [Cod PLS2] : P2
```

[1] [0]  
FRAME MODE  
(INT)

<Display and setup of frame mode: INT>

Displays the LTC INT frame numbers being input from Model G16. Also, when there is no LTC, the frame mode can be set as to how many frames conversion from tach pulse should be based on. If LTC of a different frame mode is input after setup, the display will change to that frame mode.

--- Operating guide ---

```
2nd [1] [0]      [Frame 24] *  
↓  
Select by [•] --- [Frame 24] : 24 frames  
↓  
[STO]           [Frame 25] : 25 frames  
                [Frame 27] : Drop frame  
                [Frame 30] : 30 frames
```

[0] [9]  
FRAME MODE  
(EXT)

<Display and setup of frame mode: EXT>  
As the input LTC EXT frame mode can be displayed and setup same as for above INT, it is convenient at input of the reference, other than LTC, in the master.

--- Operating guide -----

2nd [0] [9]	[E F F A	24]*
↓		
Select by [•]	[E F F A	24]: 24 frames
↓	[E F F A	25]: 25 frames
[STO]	[E F F A	2F]: Drop frame
	[E F F A	30]: 30 frames

-----

#### GENERATOR RELATED COMMANDS

[7] [2]  
GEN MODE

<Setup of the generator mode>  
LTC OUT (18) is common for both generator and reader outputs and any output can be selected from among the following four modes.

- Free run: This is the generator output.  
\* Refer to "4-2-1. 1) Recording of time code" on how to use the generator.

Reader outputs are in the next three modes.

- Through: LTC that is read in is wave shaped and output.
- Sweep : LTC of continuous stepped values are output.
- Skip : LTC values in step stone intervals are output.

#### Additional explanation: Reader output

During PLAY, it will always be "through" regardless to the setting. During FF/RWD, it will be in the setup mode but nothing is output when "through" is selected. It should normally be set to "sweep." (Refer to "(18) [LTC OUT], 2. NAMES AND FUNCTION OF THE CONTROLS.")

--- Operating guide ---

```
2nd [7] [2]      [CAND THRU] *
  ↓
Select by [•]    [CAND THRU] : Through
  ↓              [CAND SWEEP] : Sweep      Reader
[STO]           [CAND SKIP]  : Skip
                [CAND FRUN]  : Free run   Generator
```

[7] [3]  
GEN FRAME

<Setup of generator frame mode>  
This is for setting the frame mode of the LTC generator.

--- Operating guide ---

```
2nd [7] [3]      [CFAND 24] *
  ↓
Select by [•]    [CFAND 24] : 24 frames
  ↓              [CFAND 25] : 25 frames
[STO]           [CFAND 2F] : Drop frame
                [CFAND 30] : 30 frames
                [CFAND nd] : Non drop
                               frame
```

COMMANDS RELATED TO VARIOUS AUTO FUNCTIONS

[1] [3]  
PLAY TO PARK

<Play to park function>  
Play to park is the function, in locate operation, of temporarily locating at a point beforehand of the locate point, then reading LTC in the play mode and accurately stopping at the objective point. How many seconds beforehand should it locate can be setup in the range of 0 ~ 9 seconds.

--- Operating guide (Setup to 3 seconds) ---

```
2nd [1] [3]      [PRP 0] *
  ↓
[3]              [PRP 3]
  ↓
[STO]
```

[5] [1]  
 OFFSET  
 AUTO REC

<Auto recording with offset>  
 Even though offset has been setup, auto recording is possible with the master and slave locked by switching on this function. In other words, offset value is automatically added against the slave side punch in/out point data.

--- Operating guide -----

2nd [5] [1] [O.F.F]\*

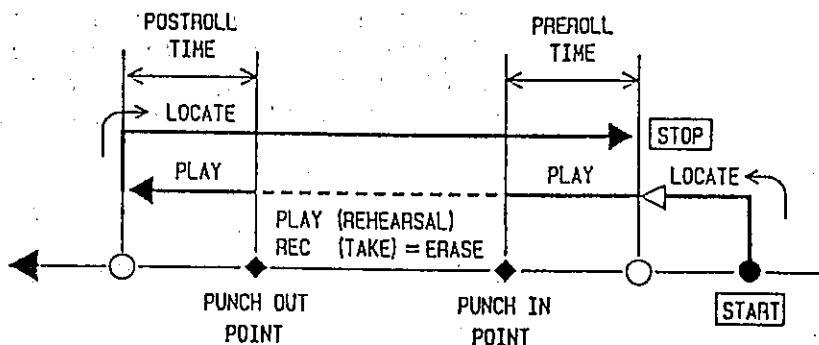
↓  
 Select by [.] [O.F.F]: ON  
 ↓ [O.F.F]: OFF

[STO]

[AUTO REC]  
 AUTO  
 SPOT ERASE

<Auto spot erase mode>  
 This is the mode for automatic spot erasing as shown below, and either rehearsal or take must be selected. The setup method of position memory for punch in/out points is similar to auto recording mode. ([STO] → [AUTO REC])

\* This command is the only exception in which [AUTO REC] is pressed without using two digit numbers by the [n] key. Therefore, it will enter auto recording when [AUTO REC] is directly pressed and, by [AUTO REC] of the 2nd mode, it will be in the auto spot erase mode.



- (1) Select rehearsal/take; start operation by [STO].
- (2) Locate to the start point (a point before the punch in point by "pre-roll time" length).



- (3) Enter the PLAY mode and execute between punch in and punch out points.
- (4) After punch out, it will run for "post roll time" then, locate toward the start point.
- (5) It will STOP at the start point to complete the operation.

--- Operating guide -----

```

2nd [AUTO REC]      [SP7 REHR]*
  ↓
Select by [•]      [SP7 REHR]: Rehearsal
  ↓
                  [SP7 TAKE]: Take
Execute by [STO]

```

[7] [5]  
 AUTO S.E.  
 TIME SET

<Setup of time in the auto spot erase mode>  
 Pre/post roll time in the auto spot erase mode can be setup in the range of 1 ~ 9 seconds. Pre/post roll time will be the same figures.

--- Operating guide (Setup to 3 seconds) -----

```

2nd [7] [5] [SP7rol 1] *
  ↓
  [3]      [SP7rol 3]
  ↓
  [STO]

```

[1] [6]  
 POST ROLL

<Setup of post roll time>  
 The original Model G16 has the exclusive [PRE-ROLL] key but post roll time can now be setup by this POSTROLL command. This is the same as explained in auto spot erase and when executing auto return, it will start operating the pre-determined length of time prior to the locate start point. This can be setup in the range of 0 ~ 9 seconds.

--- Operating guide (Setup to 3 seconds) -----

```

2nd [1] [6] [PS7rol 0] *
  ↓
  [3]      [PS7rol 3]
  ↓
  [STO]

```

COMMUNICATION RELATED COMMANDS

[6] [0]  
COMMUNICATION

<Communication>  
This command will be a display only, indicating that serial I/O is "MIDI."

--- Operating guide -----

2nd [6] [0] [5 . 0 . 5 . 0 .]

MIDI INTERFACE RELATED COMMANDS

\* The following are mode setting commands for the MIDI interface. Refer to "5-2. Mode setting" for details.

[6] [3]  
ADDRESS

<Setup of address>

[6] [4]  
ADDRESS FREE

<Setup of address free mode>

[6] [5]  
CH VOICE  
MESSAGE

<Receive mode of channel voice message>

OTHER AUXILIARY FUNCTION RELATED COMMANDS

[0] [0]  
VERSION

<Display of software version>  
Software version contained in Model 8330 will be displayed. This is convenient in checking future version up.

2nd [0] [1] used up to the present is for display of the Model G16 main unit software version.

--- Operating guide -----

2nd [0] [0] [CE-5 100]

↓  
[CLR]

[8] [9]  
MEMORY  
INIT.

<Memory initializing>  
Method of operation is same as at individual use of Model G16 but when this command is executed, all memory of Model 8330 will be initialized and return to the factory set default value.

--- Operating guide -----

2nd [8] [9] [MEM INIT]  
↓  
[STO]

[8] [7]  
MEMORY COPY  
(S → G)

<Memory copy mode: 8330 → G16>  
Model 8330 cue memory content 0 ~ 9 will be copied into the Model G16 main unit cue memory. This is for effective use of both memory data when switching the synchronizer ON and OFF.

--- Operating guide -----

2nd [8] [7] [MEM 5-G]  
↓  
[STO]

[8] [8]  
MEMORY COPY  
(G → S)

<Memory copy mode: G16 → 8330>  
This is copy from Model G16 to Model 8330 - the reverse procedure to the above.

--- Operating guide -----

2nd [8] [8] [MEM G-S]  
↓  
[STO]

• 2nd MODE SCAN PROCEDURE

In the original functions of Model G16, there is the "Continuous recall mode." This is continuous recalling of the 2nd mode which allows editing at any desired point. Its method in operation has been changed in the following ways.

-----  
 In the 2nd mode, display can be scanned in either direc-  
 tion with the [+] or [-] keys while pressing [TRIM].  
 This function can be entered from any 2nd mode.  
 -----

```

    ▽
    ▽
[0] [0] Version                [VERS 100]
    ▽
[0] [2] Machine select        [MARC 000]
    ▽
[5] [2] Rate learning of tach pulse [TRCLER 0]
    ▽
[8] [1] Tape speed            [SPD ---]
    ▽
[0] [9] Frame mode: EXT       [EF 0 dF]
    ▽
[1] [0] Frame mode: INT       [IF 0 dF]
    ▽
[1] [3] Play to park          [PR 0]
    ▽
[1] [4] Park area and start point on/off [PP.SP on]
    ▽
[1] [5] Park area and start point setup [SP.10.PP.20.]
    ▽
[1] [6] Post roll time        [PS 0 0]
    ▽
[2] [4] Code mode              [Cod 0 0]
    ▽
[2] [0] Lock mode              [L 0 0]
    ▽
[1] [7] Lock damping           [L 0 0]
    ▽
[5] [1] Auto recording with offset [o REC 0F]
    ▽
[1] [8] Chase window          [C.W 0 4]
    ▽
[2] [1] Direction signal       [Ed 0 0]
    ▽
[2] [3] Slave wait mode        [S.W 0F]
    ▽
[2] [5] Code only master       [Co 0 0F]
    ▽
[2] [6] Master control         [MS 0 0F]
    ▽
[2] [7] No tach pulse mode     [No TP 0F]
    ▽
[6] [0] Communication          [S 0 0.]
    ▽
  
```

[6] [3] Address setup	[ADCH 01]
▽	
[6] [4] Address free mode	[ADFR 0F]
▽	
[6] [5] Channel voice message	[CHVC 0F]
▽	
[7] [2] Generator mode	[GAD 7H-0]
▽	
[7] [3] Generator frame mode	[GFAD 24]
▽	
[AUTO REC] Auto spot erase mode on/off	[SP7 FEHR]
▽	
[7] [5] Auto spot erase mode setup	[SP7 FOL 1]
▽	
[8] [7] Memory copy: 8330 → G16	[MCPH 510]
▽	
[8] [8] Memory copy: G16 → 8330	[MCPH 015]
▽	
[8] [9] Memory initializing	[MEL 017]
▽	
▽	

- In regards to the 2nd mode of the original Model G16, it will scan in its original way. In other words, when it enters the 2nd mode and [2nd .] is displayed, it will scan in one direction when [.] is pressed. Once it enters each individual 2nd mode, it cannot enter scan operation.
- Since "Frame setup" and "Memory clear" is contained in mode scan of the new Model 8330, these have been deleted and "Synchronizer ON/OFF" have been newly added.
- As "Reel control on/off" and "Synchronizer on/off" cannot be changed while in this scan mode, execute each 2nd mode.

▽	
▽	
[0] [0] Version	[VER 100]
▽	
[1] [1] Reel size (T)	[R17 114]
▽	
[1] [1] Reel size (S)	[R15 114]
▽	
[1] [2] Max speed	[R15P 253]
▽	
[8] [0] Cumulative play time	[P7A 0000]
▽	
[9] [1] Reel control on/off	[RCTRL ON ]
▽	
[9] [0] Synchronizer on/off	[SYNCTRL ON ]
▽	
▽	

## Quick reference chart of 2nd mode function

"\*" indicates default value.

Command key	Function	Display	Operation	Key	Page
[6] [3]	Address	RdCH 0 :	01* ~ 16	[n]	32
[6] [4]	Address free mode	RdFr 0F	on/off*	[.]	32
[AUTO REC]	Auto spot erase	SP7 REFR	Rehearsal*/take	[.]	30
[7] [5]	Auto spot erase	SP7 rol :	1* ~ 9sec	[n]	31
[6] [5]	Channel voice message	CHVC 0F	on/off*	[.]	32
[2] [6]	Chase master control	CHSAC 0F	on/off*	[.]	26
[1] [8]	Chase window	C.W ind 4	1 ~ 9sec :4*	[n]	24
[2] [4]	Code mode	Code LTC	LTC*/VP/P1/P2	[.]	27
[2] [5]	Code only master	CodeARS 0F	on/off*	[.]	25
[6] [0]	Communication	So n id .	MIDI		32
[2] [1]	Direction signal	Ed r d r	Direction*/tally	[.]	23
[0] [9]	Frame mode: EXT	EF r n 24	24*/25/DF/30	[.]	28
[1] [0]	Frame mode: INT	IF r n 24	24*/25/DF/30	[.]	27
[7] [3]	Generator frame mode	GF r d 24	24*/25/DF/30/nDF	[.]	29
[7] [2]	Generator mode	Gr d THRU	Thru*/sweep/skip/ free run	[.]	28
[5] [2]	Learning of tach pulse	TACHLEAR n	Execute by [ST0]		23
[1] [7]	Lock damping	Lo y d r P 0	0* ~ 9	[n]	25
[2] [0]	Lock mode	Lo d RU 7 0	frame/auto*/sync	[.]	21
[0] [2]	Machine select	ARC nor	nor*/D-20	[.]	24
[8] [7]	Memory copy(S→G)	ACPY S_G	Execute by [ST0]		33
[8] [8]	Memory copy(G→S)	ACPY G_S	Execute by [ST0]		33
[8] [9]	Memory initialize	AE n . 7	Execute by [ST0]		33
[2] [7]	No tach pulse mode	no TP 0F	on/off*	[.]	26
[5] [1]	Offset auto REC	o-REC 0F	on/off*	[.]	29
[1] [3]	Play to park	PR to 0	0* ~ 9sec	[n]	29
[1] [6]	Post roll time	PS7 rol 0	0* ~ 9sec	[n]	31
[1] [4]	Slave park & start (on/off)	PP SP on	on*/off	[.]	21
[1] [5]	Slave park & start (set up)	SP 10PP20.	0 ~ 99F PP=20F, SP=10F*	[n]	22
[2] [3]	Slave wait	S.WR 7 0F	on/off*	[.]	24
[0] [0]	Soft version	SE r S 100			32
[9] [0]	Synchronizer	SP r C on	on*/off	*1	20
[8] [1]	Tape speed	SP d 100	INT*/EXT	[.]	26

\*1 This command only will change condition each time it is executed.

### 3-4. Editing procedure

Editing of various time data is basically the same with single use of Model G16. In other words, there were the following three methods:

- (1) Press [CLR] and newly input by [n].
- (2) Press [RCL], select digit to be edited by [.] and input by [n].
- (3) Press [HOLD] and store in memory.

In addition to input by the numerical keypad [n], it also has the trim mode (all digit trim; two digit trim) for trimming by using the [+]/[-] keys.

Features are the same up to this point but Model G16 has been upgraded with the following two features as compared to the original model.

- 1) The function of handling two time data as a pair has been added. These are simultaneously displayed in the upper and lower displays.
  - 2) All time data will be handled down to sub-frame units.

In regards to 1), there was the zone limit feature. In addition to this, hold function explained in above (3), auto return, auto recording and auto spot erase are now available.

- HOLD FUNCTION simultaneously holds internal LTC in the upper display and external LTC in the lower display.
- AUTO RETURN will show the objective point time in the upper display and operation start point time in the lower display.
- AUTO RECORDING or AUTO SPOT ERASE will show the punch in point time in the upper display and punch out point time in the lower display.

When editing these time data, it must be done in the [MEMORY DISPLAY] (lower display). If the upper display must be edited, press [HOLD] to exchange content of the upper and lower display. Upper and lower displays will be exchanged each time [HOLD] is pressed. After this, the conventional method is used to edit. Upon executing [STO] + [?], values shown in the upper

upper and lower displays will be respectively stored in the memory.

\* After editing, be sure to check the upper and lower time relationship, then execute [STO] → [?].

In regards to 2), the sub-frames can be edited. As the Model G16 display has no sub-frame digits, the display mode must be switched.

Each time [+10] is pressed during edit of time memory, the display will shift two digits and alternately change between H M S F and M S F SF.

Example: In the case of 00H05M01S15F96SF, it will change as follows:

[00H05M01S15F] ← → [ \_ 05H01M15S96F]

↑  
Indicates sub-frame mode.

\* In the sub-frame display mode, the printed "H M S F" will be off line and thus will have no meaning.

How to escape from the edit mode

Return to normal mode from the edit mode can be accomplished by pressing the original Model G16 [STO] or [RCL] keys twice but this is also possible by pressing [DISPLAY].



#### 4. SYNCHRONIZER

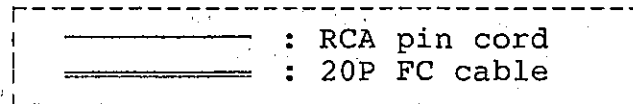
Fundamental operation of the synchronizer will be explained in this Section.

##### 4-1. Connecting procedures

A basic connecting example is shown below. A system can be built by simply connecting a recorder which is to be the master.

- Following is example of time code recorded on track 16.

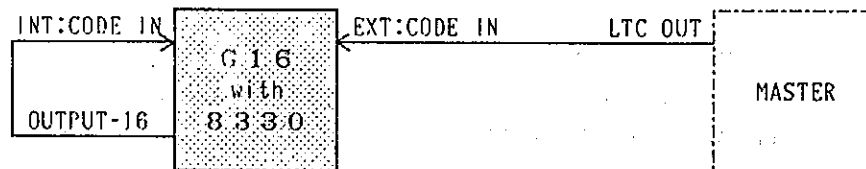
- Cables:



- Optional cable set of RCA pin cord and 20P FC cable, Model 8547 is available.

##### (1) When LTC is also output at FF/RWD of the master

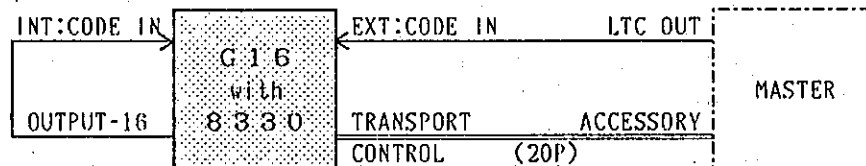
DAT Model D20 complying to time code and Model G16 installed with Model 8330 correspond to this.



- In this case, switch ON "code only master" by the 2nd mode [2] [5] and "no tach pulse mode" by the 2nd mode [2] [7].

##### (2) When LTC is output in only PLAY of the master

This condition corresponds to Models G16, R8, M80/20, E2/22/8/16 which have the Fostex common 20P accessory port. When ATR's and VTR's of other manufacturers are to be used, it may separately require an interface. In such a case, it is recommended to consult your nearest Fostex office.



- \* When Model G16 installed with Model 8330 is to be the master, LTC OUT level must be adjusted. This is done by the rear panel level control pot (16).
- \* Especially when Model D-20 is the master, execute the 2nd [0] [2] machine select mode and select the D-20 mode.
- \* Before operation, it is recommended to check the following 2nd modes.

```

[2] [0] Lock mode
[2] [1] Direction signal
[0] [2] Machine select
[2] [5] Code only master mode
[2] [7] No tach pulse mode
[2] [4] Code mode

```

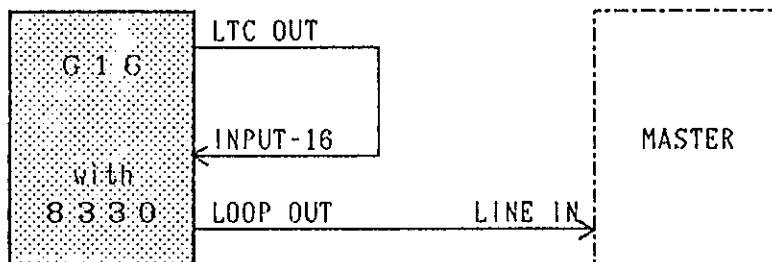
#### 4-2. Operating procedures

##### 4-2-1. Basic operation until locking

Upon completing setup, let's try locking. Explanation here will be on basic operation as a chase synchronizer.

##### 1) Recording of time code

First, time code must be recorded in G16 and the master. Connecting example (for recording on track 16) is shown below.



- (1) Connection: Connect {LTC OUT} jack (18) to track 16 line input. Any track will do but track 16 is customarily used and if {LOOP OUT} is employed, LTC can be sent to the master at the same time.
- (2) Setup of generator mode: Execute 2nd [7] [2] and set the "free run mode."

- (3) Setup of frame mode: Select the frame mode by 2nd [7] [3]. (24, 25, DF, nDF, 30)
  - (4) Setup of display: Press [DISPLAY] (7) and select the "generator display mode." As a result, generator start time (default is 0) will be displayed and <<GEN>> will be lit. This completes preparation of the generator. Press [•] to run the generator; press [•] again and it will stop.
  - (5) Setup of recording level: Set track to be recorded (track 16, in this case) in the input monitor mode and press [•] to start the generator. Set recording level to around 0dB with the LTC OUT level control pot (16). Then, stop tape for the moment.
  - (6) Setup of start time: Set LTC start time by [RCL] [DIS-PLAY]. Setup method is same as with normal time edit.
  - (7) Start recording, then start the generator by pressing [•]. Stop tape upon completing the recording.
- \* After recording is completed, it is better to cancel the "free run mode" by the 2nd [7] [2] command. It is normally set to the "sweep mode."

## 2) Learning of tach pulse rate

Model 8330 will learn the relationship between tach pulse and LTC of both the master and slave, and comprehend the correct position.

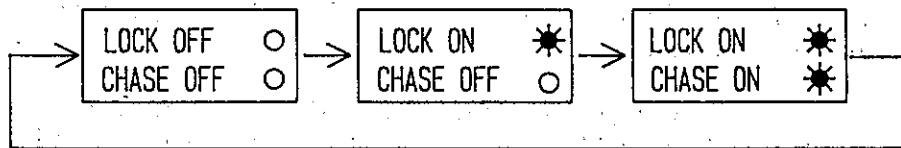
- Learning mode is automatically entered upon switching on power to Model G16.
  - (1) Enter master and slave in the play mode, then input LTC.
  - (2) Both LTC indicator <<LTC INT>> (1) and <<LTC EXT>> (2) will blink to indicate that learning is in progress.
  - (3) After a lapse of several seconds, the LTC indicator will change to constant lighting to indicate that learning has been completed. This finishes learning of the tach pulse rate.
- After learning is completed, LTC indicator will be lit only when LTC is being input correctly.

- Re-learning is possible in the 2nd mode. This is convenient when tape is changed or LTC must be re-recorded.

Learning mode can be entered by executing 2nd [5] [2], then pressing the [STO] key.

### 3) Lock on/chase on

The following three modes will be entered sequentially with each press of [LOCK/CHASE] (6). Indicators <<LOCK ON>> (4) and <<CHASE ON>> (5) will be lit ON at each mode.



#### LOCK ON

When lock on is entered, the Model G16 PLAY speed will be changed from 1/2 to 2 times and run toward the EXT LTC (LTC of master) time displayed at the lower side of the display, and when it comes within one frame difference from the master, the <<LOCKED>> (3) indicator will blink and change to constant lighting when it is positively locked. Should lock be disengaged, this indicator will be extinguished.

Lock mode can be setup by (2nd mode [2] [0]). Default is set for "Auto lock mode."

#### CHASE ON

The time until lock will be comparatively short if the Model G16 position is near to that of the master but if it is at a distance, it will require excess time to chase by the PLAY mode only. Now, if [LOCK/CHASE] is pressed again to enter the LOCK ON/CHASE ON mode, Model G16 will approach the master position in FF or RWD, and upon entering a certain range called Chase Window setup by 2nd [1] [8], it will change to PLAY mode and finally lock on.

As G16 in the chase mode will follow the master in its running mode, if, for example, master is entered in FF, G16 will also enter FF. In normal application of the chase synchronizer, this mode is most regularly used.

[LOCK/CHASE] is pressed to cancel the chase mode but lock mode will also be cancelled. It will lock on if pressed again.

- In the chase mode, the Model G16 transport control button can be changed by 2nd [2] [6] for controlling the master. This is possible on provision that the master and transport control receptacle (14) are interconnected with a 20 pin cable.
- It will be of advantage if LTC or tach pulse can be output during FF/RWD in order to utilize the chase function. If this is not output, G16 must stop and wait until LTC or tach pulse is input.

#### 4-2-2. Offset modify

There are occasions whereby a lock with a certain time difference (offset) between LTC of master and slave (G16) is required. Such an example is offset between the music source and video picture.

This offset time can be setup or trimmed in real time while actually monitoring this music and video picture.

##### 1) Absolute offset and relative offset

In switching the display mode by the [DISPLAY] key, there is absolute offset (hereafter written A offset) and relative offset (hereafter written R offset) modes. In each mode, <<A OFFSET>> and <<R OFFSET>> indicators will be lit inside the display.

These offset values will be shown in the upper and lower displays. (Sub frame units in the lower display.)

**A OFFSET:** This is the actual time difference between INT LTC and EXT LTC. For example, when it is to lock, it will approach offset (setup figure), lock and stop. The figure thus setup is offset. In other words, this offset can be confirmed in the display mode when in lock.

Example: For 32S 15F 98SF

[ 000032 15 ]
[ R. o F S 98 ]
SF

**R OFFSET:** This is the difference in setup figure from A OFFSET. In other words, this is an indication of how near it is to the setup figure. Therefore, it will be "zero" when locked.

Example: For 32S 15F 98SF

[ 000032 15 ]  
[ C - OFS 98 ]  
SF

## 2) Offset setup method

There are three methods in setup of offset.

1. Hold the offset figure on display and store in memory.
2. Input offset figure in the edit mode and store.
3. Trim in real time by the trim mode.

The work flow is to first, roughly set the figure by above method 1. or 2., then trim by method 3. If the figure is known beforehand, it can be simply entered by method 2. If it is not known, master and slave tapes are each set to the starting point and then input by method 1. Each method will be explained below.

### 1. Method for holding the display: [HOLD]

- (1) Press [DISPLAY] and select A OFFSET mode of display. <<A OFFSET>> inside the display will be lit.
- (2) When [HOLD] is pressed, the time at that moment will be held and then enter the edit mode.
  - \* While monitoring the music and picture, search for the same position on the master and slave. When they coincide, the display at that moment will be indicating the approximate offset figure.
- (3) If not necessary, it is edited here, press [STO] and [OFFSET] in this order, and this figure will be stored in the offset memory.

### 2. Method of input by the edit mode: [RCL] → [OFFSET]

- (1) Press [RCL] [OFFSET] to recall the offset memory and it will enter the edit mode.
- (2) Input the desired offset figure with the [.] key and [n] of the numerical keypad.
- (3) Store in offset memory with the [STO] and [OFFSET] keys.

\* [RCL] and [OFFSET] are pressed to confirm the data before it is entered but if this is not necessary, it can be input by pressing [CLR]. ([ .]).

### 3. Small adjusting by the trim mode: [TRIM]

This method is carried out with the master and slave locked, and offset can be minutely adjusted in real time in 1/100 frame units. This is convenient for lip sync (matching mouth and speech).

- (1) Check that <<LOCKED>> is lit and in the lock mode.
- (2) Set display to the A OFFSET mode. <<A OFFSET>> will be lit.
- (3) <<TRIM>> is lit and entered in the trim mode when the [TRIM] key is pressed. At the same time, display content will change and also display the sub frame.

Example: For 32S 15F 98SF

[	0	0	0	0	3	2	:	1	5	]
[	.	0	0	5	.	9	8	]		
							SF			

- (4) Offset will increase or decrease in 1/100 frame units with each pressing of the [+] or [-] key. It will change continuously if these keys are held down. The figures will be stored in the memory at the same time.
- (5) Under the same condition, if [+] or [-] is pressed while pressing down on one key from [1] through [9], the offset frame digit can be increased or decreased by the amount of that number.
- (6) When [TRIM] is pressed, trim mode will be cancelled and <<TRIM>> will be extinguished, and the display will be in the [RCL] [OFFSET] state.

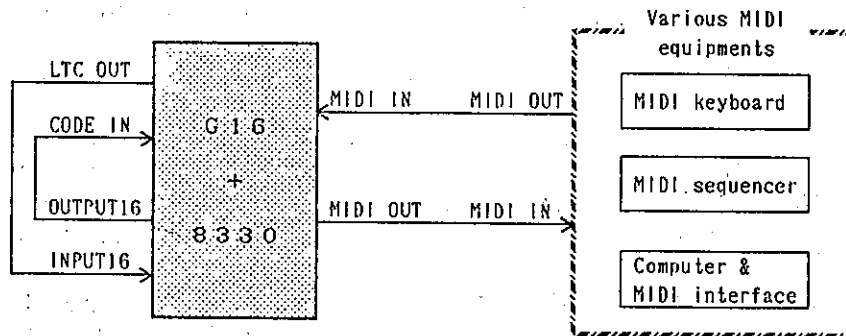
\* In this mode, trimming by [+] or [-] will be for all digits and trimming of two digits each is not possible.

## 5. MIDI INTERFACE

In this Section, explanations will be centered around various messages which can be received or transmitted by the MIDI interface.

### 5-1. Basic connection

A fundamental connecting example is shown below.



### 5-2. Mode setting

Various modes are initially set (initialized) by the 2nd mode.

- |   |                                      |
|---|--------------------------------------|
| 1) Set address                            | : 2nd [6] [3] → Input 1 ~ 16 by [n]  |
| 2) Set of address free                    | : 2nd [6] [4] → Select ON/OFF by [•] |
| 3) Receive mode of channel voice message: | 2nd [6] [5] → Select ON/OFF by [•]   |

- \* Various set data will be backed up at switch off of power.
- \* "\*" indicates default.

#### 1) Address setting: 2nd [6] [3]

Address is applied, both to the so-called "MIDI channel" of the channel voice message and, to the so-called "device number" of the universal system exclusive message. In other words, MIDI channel and device number are always the same value (these cannot be set separately) in the Model 8330, and this value is called "address."



\* The MIDI specification declares that device number can be specified in the range of 1 ~ 128 but this is limited to the 1 ~ 16 range in Model 8330.

\* The setup address is common for both transmit and receive.

--- Operating example (for setup in channel 16) -----

```

2nd [6] [3]          [RdCh 01] *
  ↓
  [1] [6]           [RdCh 16]
  ↓
  [STO]

```

2) Setup of address free mode : 2nd [6] [4]

Address free is the mode for receiving MIDI channel and device number of the message sent to Model 8330 even though they do not match the setup address. When this mode is OFF, only those that match with the address will be processed.

--- Operating example -----

```

2nd [6] [4]          [RdFr 0F] *
  ↓
Select by [•]       [RdFr 00] : Address free
  ↓                 [RdFr 0F] : Address fixed
  [STO]

```

3) Receive mode of channel voice message : 2nd [6] [5]

Whether the channel voice message sent to Model 8330 should be received or ignored, is setup. For example, if the address is set to "11" in above 1), and set to "receive OK" of the channel voice message, note on message (transmit channel 11) sent from the sequencer or MIDI key board can be used to control Model G16.

--- Operating example -----

```

2nd [6] [5]          [ChVc 0F] *
  ↓
Select by [•]       [ChVc 00] : Receive
  ↓                 [ChVc 0F] : Ignore
  [STO]

```

### 5-3. MIDI message

The functions of Model 8330 can be utilized in full by using the Fostex system exclusive message. Control of Model G16 is possible by the channel voice messages (note on message, etc.) and universal system exclusive messages (setup message, etc.) but in such cases, all functions of Model 8330 cannot be utilized.

\* Fostex system exclusive messages are Fostex exclusive messages using the Fostex ID codes.

"List of MIDI messages" which can be received and transmitted by Model 8330 is given in the next page.

- Receive message  
Messages in the list written <Receive> are acknowledged and others are ignored. Among these, those whose parameter value is not within the range defined by Model 8330 (undefined note number, etc.) will be ignored.
- Transmit message  
Messages in the list written <Transmit> will be transmitted. Transmission is carried out when various request messages are received (when a reply is requested) or when it is setup in such a request mode (for example, a mode requesting output of MTC). When sending a message of the type containing a device number such as in an identity reply, it is sent by an address set by 2nd [6] [3]. (It will not be affected by the address free setting.)
- Communicating method  
Communication is carried out in open loop. In other words, the same as with other MIDI equipments in general, Model 8330 will not output a reply message to other than those requesting a reply. This is also the same in the Fostex system exclusive message.
- NOTE  
This manual does not contain details on content of the Fostex system exclusive messages. If you wish to compile a program using these messages, consult your nearest Fostex office. (Depending on the case, Fostex Corp. will supply the necessary materials.)  
In the following, various MIDI messages (channel messages and system messages) necessary in controlling Model 8330, without using the Fostex system exclusive messages, will be explained.

## GLOSSARY OF MIDI MESSAGES

### Δ Channel messages

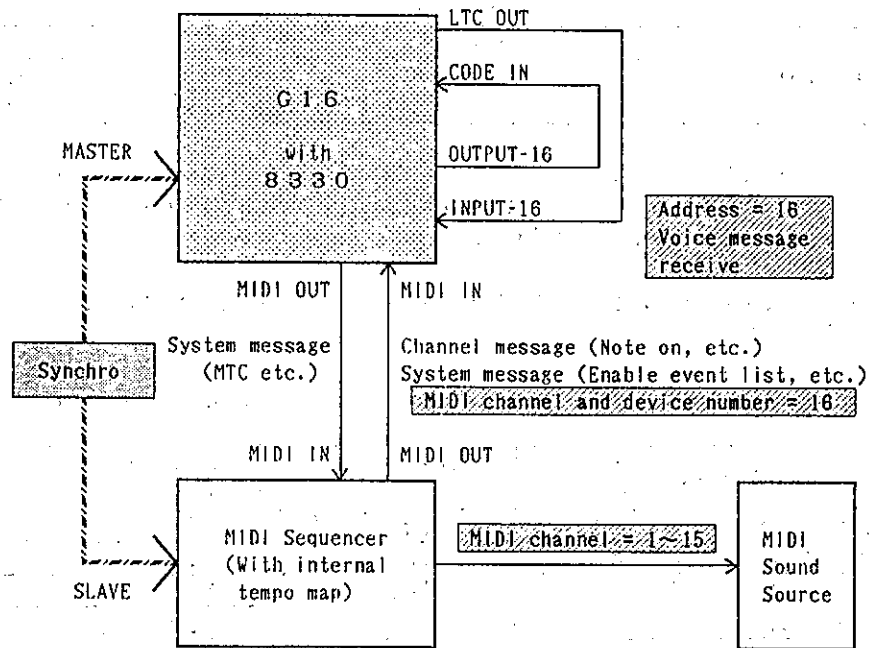
- Channel mode message (Receive) ..... 52
  - Local control on/off
  - All note off
  - Omni on/omni off
- Channel voice message (Receive) ..... 52
  - Note on/note off
- \* Normal operation ..... 54
  - PLAY            CUE ON/OFF
  - RECORD        F.FORWARD
  - LOCATE        PUNCH OUT
  - REVIEW        STOP
  - REWIND        LOOP
- \* Shift operation ..... 57
  - Remote control yes/no selection ..... 57
  - Generator RUN/STOP selection ..... 57
  - MTC output ON/OFF setup ..... 58
  - Direct time lock signal output ON/OFF setup ..... 58
  - Recording YES/NO setup ..... 58
  - Local control ON/OFF setup ..... 59
  - Monitor mode setup ..... 59
  - Record track select ..... 59
  - Loop mode ON/OFF setup ..... 60
  - Specifying of loop operation mode ..... 60
  - Loop start/end point setup ..... 61
  - Punch in/out point setup ..... 61
  - Locate point setup ..... 61
  - Specifying post locate mode ..... 62
  - Rehearsal mode ON/OFF setup ..... 62
  - Auto recording mode ON/OFF setup ..... 62
  - Lock enable ON/OFF setup ..... 62
  - Chase enable ON/OFF setup ..... 63
  - Offset trim ..... 63
  - Default offset ..... 63
  - Store offset ..... 63

### Δ System messages

- System common message ..... 66
  - MTC quarter frame message <Receive><Transmit>

- Universal system exclusive messages
  - MTC full message <Receive><Transmit> ..... 67
  - MTC user bit message <Transmit> ..... 67
  - MIDI cueing setup message <Receive><Transmit> ..... 68
    - Enable event list ..... 68
    - Disable event list ..... 69
    - Clear event list ..... 69
    - Event list request ..... 69
    - Punch in point ..... 70
    - Punch out point ..... 71
    - Delete punch in point ..... 71
    - Delete punch out point ..... 72
    - Cue point ..... 72
    - Delete cue point ..... 73
  - Identity request <Receive> ..... 73
  - Identity reply <Transmit> ..... 74
- System real time messages ..... 75
  - Timing clock <Transmit>
  - System reset <Receive>
- System exclusive messages
  - Fostex system exclusive message <Receive><Transmit>
  - \* This is not explained in this manual.

The following will explain the various messages (channel messages and system messages) required for controlling Model 8330 without using the Fostex system exclusive messages. As interchangeability of the format is maintained by the MIDI specification between makers in regards to these messages, it is thus very convenient in controlling Model 8330. A representative example in compiling a system using these messages is given in the schematic below.



- \* Synchronization between Model G16 and the sequencer is possible when LTC is recorded in Model G16, the sequencer complies with MIDI time code and also contain a tempo map.
- \* Even if it is not synchronized, it is recommended that LTC be recorded on the Model G16. This is because playback of LTC from the recorder is absolutely necessary for accurate auto punch in/out. RUN/STOP of the LTC generator is possible not only by the 2nd mode but also by the MIDI message.

5-3-1. Control by channel message

- Channel mode message

Channel mode messages to which Model 8330 complies are as listed below.

Message received	Operation of 8330
Local control off	Entire Model G16 control panel will be rendered uncontrollable.
Local control on	Render G16 controllable by the control panel.
All note off	Set all "ON" notes to OFF.
Omni on	Enters the address free mode.
Omni off	Enters the address fixed mode.

\* Omni on/off has the same functions as that of the address free mode set by the 2nd mode (2nd [6] [4]) and the later set mode will have priority.

\* Address fixed mode is the address setup by the 2nd mode (2nd [6] [3]).

NOTE: Each message consists of the following number of bytes.

Message \ Byte	Status	Data 1 (Control No.)	Data 2
Local control off	Bn	122	00
Local control on	Bn	122	7F
All note off	Bn	123	-
Omni on	Bn	125	-
Omni off	Bn	124	-

\* Status and Data 2 are indicated in hexadecimal.

\* "n" indicates the channel number.

- Channel voice message

**Note on/note off**

Note on/note off, originally, are messages which have the same meaning as pressing and releasing keys of a MIDI synthesizer, etc. which receive it but Model 8330 will operate as follows when it receives it.

To simplify the explanations, "receiving of note on/note off" by Model 8330 will be replaced by "press/release" of the MIDI keyboard. In other words, explanations will be on the assumption that MIDI OUT of a MIDI keyboard is plugged into the MIDI IN jack (10).

- Entering the message

There are two different methods to enter a message (method of operating the MIDI keyboard) into the Model 8330.

Normal method (Single pressing)

This is the single pressing of the MIDI keyboard. It is pressing the key such as to transmit a "single tone" to Model 8330.

Shift method (Multiple pressing)

The method of holding one key down while pressing another. This transmits a "double tone" to the Model 8330. In this case, the first key pressed is called SHIFT key and the next key pressed is called the NORMAL key. In explanations hereafter, they will be indicated as shown below.

Example: [78] + [57]

Key "57" is pressed while pressing note number "78."

Operation by the normal method (Single pressing)

Model G16 can be controlled as shown below when note on/off output by the normal method is received. Content of the control will be determined by the note number received. Note off can also be replaced by note on at velocity "00".

Model G16 can be auto-controlled by setting the various parameters with the shift operation explained later.

Note number (Hexadecimal)	Note on	Note off	Remarks
48 (30H)	PLAY		G16 will immediately enter PLAY.
49 (31H)	RECORD		G16 will immediately enter RECORD.
51 (33H)	LOCATE		G16 will immediately enter LOCATE.
52 (34H)	REVIEW		G16 will immediately enter REVIEW.
53 (35H)	REWIND		G16 will immediately enter REWIND.
55 (37H)	CUE ON	CUE OFF	G16 will remain in the CUEING mode as long as CUE is held pressed. Cueing is cancelled upon releasing CUE.
57 (39H)	F.FORWARD		G16 will immediately enter F.F.
59 (3BH)	PUNCH OUT		Cancels the RECORD mode when G16 is in the RECORD mode.
60 (3CH)	STOP		G16 will immediately STOP.
61 (3DH)	LOOP		G16 will immediately enter the LOOP mode.

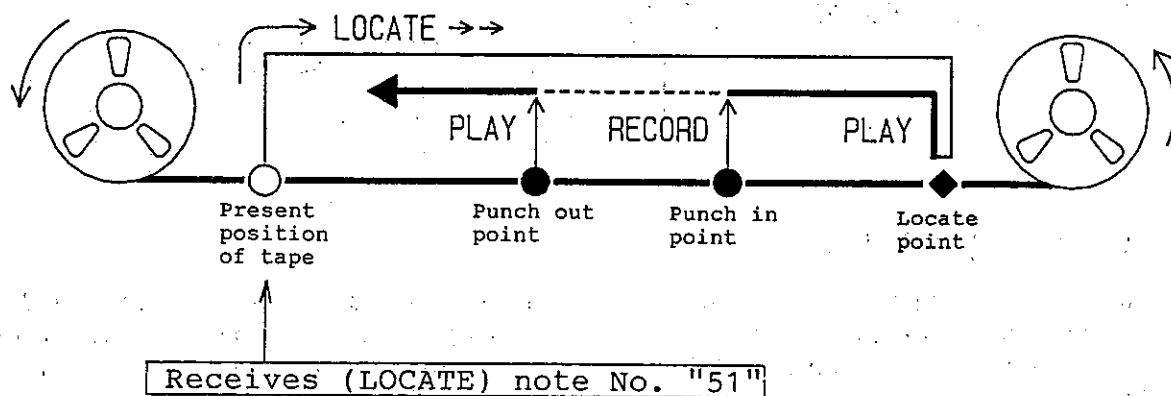


• On the locate mode

Locate mentioned here refers to the following chain of operations. Each parameter (Quoted by " ") is set by shift operation explained later.

- (1) It starts by note number [51] and locates toward the set "locate point."
- (2) After arriving at the "locate point," it enters the operation mode specified by "post locate mode" (PLAY, STOP, RECORD... etc.).

--- Example of locate operation ---  
 (When "AUTO REC" is specified in the post locate mode)

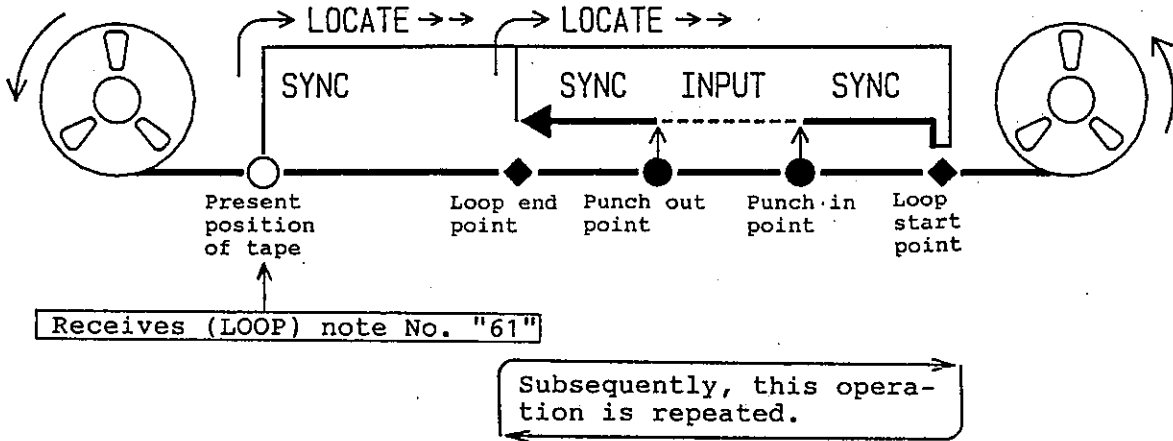


• On the loop mode

Loop operation mentioned here refers to the following chain of operations. Each parameter (Quoted by " ") is set by shift operation explained later.

- (1) It starts by note number [61] and locates toward to the set "loop start point."
- (2) After arriving at the "loop start point," it enters the operating mode specified by "loop operation mode" (PLAY, STOP, RECORD... etc.).
- (3) If "loop mode" is set ON, it will run in the play mode (or record mode) and upon arriving at the "loop end point," it will locate toward the "loop start point" (If "loop mode" is set to OFF, it will end at (2)).
- (4) After this, (2) and (3) are repeated.

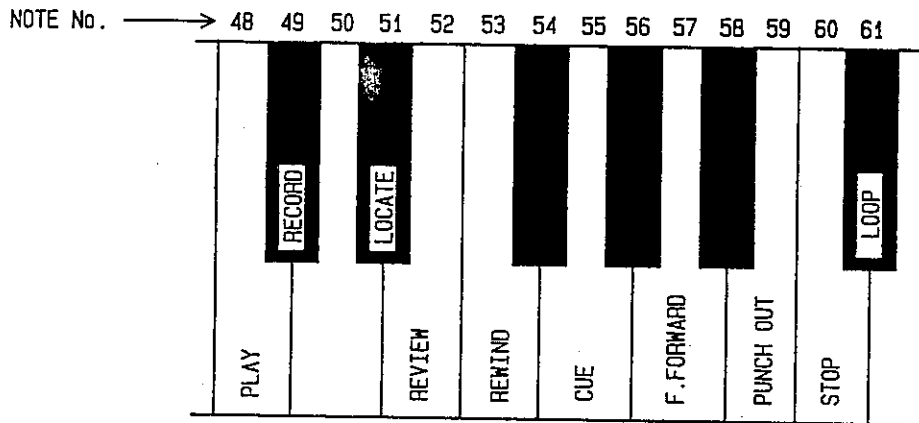
--- Example of loop operation (When "REHEARSE" is specified --- for the loop operation mode)



• On the review mode

Review is the operation of the recorder locating forward for a certain length of time from its present position and then immediately entering PLAY upon arriving at the locate point. This "certain length of time" is preset to five seconds but can be edited using the Fostex system exclusive message.

• If the above is represented on the MIDI keyboard, it will be as shown below.

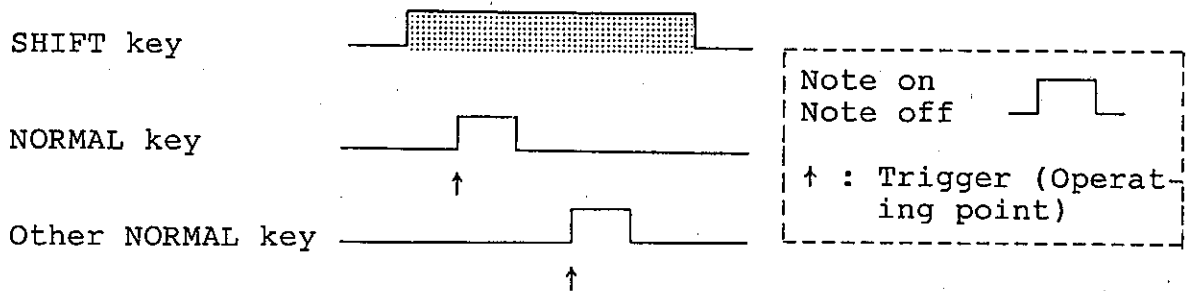


Operation by shift (Multiple pressing)

When a message using shift operation is received, not only control of Model G16 but mode also can be setup or changed. Operation content is determined by note number of the SHIFT key and NORMAL key same as in normal operation. Note on by velocity "00" can also be used for note off.

- On the operation timing

At shift operation, after arrival of note on by the SHIFT key (key pressed first), Model 8330 will be triggered at the instant note on by the NORMAL key (next key pressed) arrives before note off by the first pressing of the SHIFT key.



--- Selecting YES/NO of remote control -----

[78] → [57] : Remote control YES  
[79] → [57] : " " NO

Whether it should react or not to MIDI messages from external equipment or, in other words, whether Model 8330 should be controlled or not by various MIDI messages is selected.

--- Selecting RUN/STOP of generator -----

[78] → [56] : RUN  
[79] → [56] : STOP

Controls RUN/STOP of the LTC generator. Generator will automatically enter the "free run mode."

--- Setup of ON/OFF for MTC output -----

[78] → [61] : Output ON  
[79] → [61] : Output OFF

---

Whether or not LTC sent from Model G16 shall be converted to MIDI time code and output can be selected.

[Explanation]

MIDI time code is output by the following process.  
First, when Model G16 is entered in PLAY and LTC have been read, an MTC full message is output once. After this, it will continue to output MTC quarter frame messages until it ceases to be in PLAY (until it becomes unable to read LTC).

-- Setup of ON/OFF for direct time lock signal output --

[78] → [55] : Output ON  
[79] → [55] : Output OFF

---

Whether or not LTC sent from Model G16 shall be converted to direct time lock signal and then output can be setup.

[Explanation]

Direct time lock signal is output by the following process.  
First, when Model G16 enters PLAY and LTC is read, an equivalent to MTC full message is output once. After this, one MIDI timing clock (F8H) for each frame will be output continuously until it ceases to be in the play mode (until it becomes unable to read LTC).

\*\*\* Messages related to control of recorder (Model G16) \*\*\*

--- Setup of YES/NO for recording -----

[78] → [62] : Recording YES  
[79] → [62] : Recording NO

---

Whether or not Model G16 is permitted to record can be set up. NO is given highest priority over others.

--- Setup of ON/OFF for local control -----

[78] → [58] : ON (Not disengaged)  
[79] → [58] : OFF (Disengaged)

-----  
Identical to local control ON/OFF by channel mode message, whether or not the controller shall be cutoff from the Model G16 main unit can be setup.

--- Setup of monitor mode -----

[82] → [45] : SYNC (1)  
[82] → [47] : INDIV. INPUT (2)  
[82] T [48] : ALL INPUT (3)

-----  
Monitor mode of Model G16 can be setup.

- (1) Sync playback mode is entered. As Model G16 is the two head type, this is the normal playback mode.
- (2) The individual input monitor mode is entered. The track specified by the record track selector only enters the input monitor mode.
- (3) All input monitor mode is entered. All tracks will be in the input monitor mode.

--- Record track selecting -----

[83] → [36] ~ [68] : Setting the record permit track (RDY)  
[84] → [36] ~ [68] : Setting the record prohibit track (SAFE)

Record track select (specifying the recording track) can be set for Model G16. Track number is determined by the NORMAL key as shown below.

NORMAL key	Track No. for record permit/prohibit
36	All tracks
37	Track 1
38	Track 2
39	Track 3
40	Track 4
↓	↓
49	Track 13
50	Track 14
51	Track 15
52	Track 16
53	(Track 17)
↓	↓
68	(Track 32)

NOTE: As there are only 16 tracks in Model G16, note number of the NORMAL key will not change from 53 through 68.

• Setting related to loop operation

Each parameter for loop operation is set by messages shown below.

- (1) Setup of loop mode ON/OFF.
- (2) Specifying the loop operation mode.
- (3) Setup of loop start/end point.

\* Loop operation starts by the normal method "LOOP"

--- Setup of loop mode ON/OFF -----

[78] → [65] : Loop mode ON  
 [79] → [65] : Loop mode OFF

--- Specifying the loop operation mode -----

[80] → [48] : PLAY mode  
 [80] → [49] : RECORD mode  
 [80] → [50] : REHEARSE mode  
 [80] → [51] : AUTO REC mode  
 [80] → [60] : STOP mode

Setup method of the various points

Loop start/end point, punch in/out point, locate point are all setup by the same procedure.

Values registered in each point are the "present time" of the time information which Model 8330 uses as the time reference. In other words, it is the "present position of Model G16 at the instant NORMAL key was pressed." For example, if the NORMAL key for the note number set for each point is pressed at the instant Model G16 passes the "00H15M30S20F frame" point in the play or fast wind modes (or when stopped there), value "00H15M30S20F" will be registered in that desired point. This value will be rewritten each time this operation is executed.

--- Setup of loop start/end point -----

[82] → [61] : Setup of the loop start point  
[82] → [62] : Setup of the loop end point

--- Setup of the punch in/out point -----

[82] → [64] : Setup of the punch in point  
[82] → [65] : Setup of the punch out point

\* Setting related to locate operation

Each parameter for locate operation is setup by the following messages:

- (1) Setup of the locate point
- (2) Specifying the post locate mode

\* Locate operation is started by normal "LOCATE" operation.

--- Setup of the locate point -----

[82] → [63] : Setup of the locate point

--- Specifying the post locate mode -----

[81] → [48] : PLAY mode  
[81] → [49] : RECORD mode  
[81] → [50] : REHEARSE mode  
[81] → [51] : AUTO REC mode  
[81] → [60] : STOP mode

---

--- Setup of the rehearsal mode ON/OFF -----

[78] → [63] : Rehearsal mode ON  
[79] → [63] : Rehearsal mode OFF

---

If the rehearsal mode is set to "ON", monitor mode will automatically enter "INDIV. INPUT" between the punch in point and punch out point.  
When "REHEARSE" is specified for the loop operation mode or post locate mode, and this operation is executed, the rehearsal mode will be automatically switched "ON" at that instant.

--- Setting ON/OFF of the auto recording mode -----

[78] → [64] : Auto recording mode ON  
[79] → [64] : Auto recording mode OFF

---

If the auto recording mode is set to "ON," it will automatically enter the recording mode between the punch in point and punch out point. The monitor mode will not be changed but the track being recorded will be forced into the input monitor mode.  
When "AUTO REC" is specified for loop operation mode or post locate mode and this operation is executed, this setting is automatically switched "ON" at that instant.

• Setting related to the synchronizer

--- Setup of lock enable ON/OFF -----

[78] → [59] : Lock enable ON  
[79] → [59] : Lock enable OFF

---



--- Setup of chase enable ON/OFF -----

[78] → [60] : Chase enable ON  
[79] → [60] : Chase enable OFF

-----  
Lock on/chase on related to the synchronizer can be controlled. When chase enable is switched "ON," lock enable will be also switched "ON."

--- Offset trim -----

[77] → [36] : +1SF increment  
[77] → [37] : -1SF decrement

-----  
Same as with the "Trim mode" explained in "4-2-2. Offset modify," offset can be trimmed in 1/100 frame units in real time.

--- Default offset -----

[82] → [59] : Set offset to "0."

-----  
Offset can be cleared to "00.00.00.00."

--- Store offset -----

[82] → [60] : Store of offset

-----  
Present offset value at that instant can be stored in real time. It is the same as for setup by [HOLD].

\* Refer to "4-2-2. Offset modify" for details on offset commands.

• List of shift operation (Multiple pressing)

(Values are note numbers. Underlined tracks are ineffective in Model G16. DTL signal = Direct Time Lock signal.)

SHIFT key NOR- MAL key	84 REC TRK select OFF 83 REC TRK select ON	82 Registering of time reference, offset, and monitor mode.	81 post locate mode 80 loop opera- tion mode	79 OFF 78 ON 77 Offset trim
68	<u>Track 32</u>			
67	<u>Track 31</u>			
66	<u>Track 30</u>			
65	<u>Track 29</u>	Punch out point		Loop mode
64	<u>Track 28</u>	Punch in point		AUTO REC
63	<u>Track 27</u>	Locate point		REHEARSAL
62	<u>Track 26</u>	Loop end point		REC permit
61	<u>Track 25</u>	Loop start point		MTC output
60	<u>Track 24</u>	Store offset	STOP	Chase enable
59	<u>Track 23</u>	Default offset		Lock enable
58	<u>Track 22</u>			Local ctrl.
57	<u>Track 21</u>			REM.ctrl.OK
56	<u>Track 20</u>			LTC GEN RUN
55	<u>Track 19</u>			DTL sig.OUT
54	<u>Track 18</u>			
53	<u>Track 17</u>			
52	<u>Track 16</u>			
51	<u>Track 15</u>		AUTO REC	
50	<u>Track 14</u>		REHEARSE	
49	<u>Track 13</u>		RECORD	
48	<u>Track 12</u>	ALL INPUT	PLAY	
47	<u>Track 11</u>	INDIV. INPUT		
46	<u>Track 10</u>			
45	<u>Track 9</u>	SYNC		
44	<u>Track 8</u>			
43	<u>Track 7</u>			
42	<u>Track 6</u>			
41	<u>Track 5</u>			
40	<u>Track 4</u>			
39	<u>Track 3</u>			
38	<u>Track 2</u>			
37	<u>Track 1</u>			Offset trim
36	All tracks			Offset trim -1SF Offset trim +1SF

- Default of Model 8330 are as follows.

Message	Default
Loop operation mode	PLAY
Post locate mode	STOP
Loop mode	OFF
Rehearsal mode	OFF
Auto recording mode	OFF
MTC output	OFF (will not output)
CUE ON/OFF	OFF (cueing cancelled)
Monitor mode	SYNC
Record permit/prohibit	Permitted
Record track select	All tracks OFF
Play to park	OFF (Function by F.S.E. message.)
Zone limit	OFF ( " )

\* F.S.E. message = Fostex System Exclusive message

- Byte format of note on/off message are as follows.  
(Indications in hexadecimal)

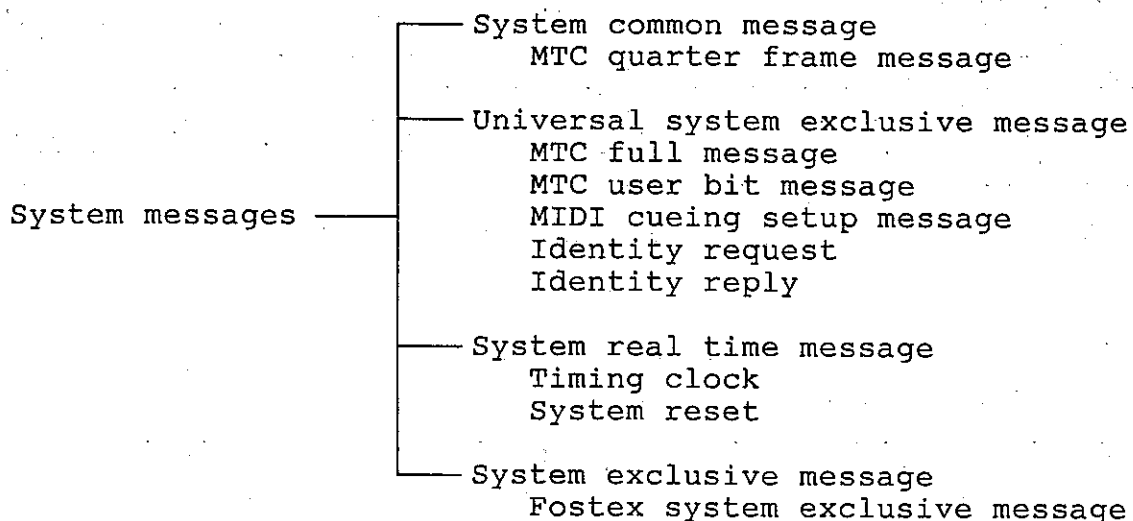
Byte Message	Status	Data 1 (Note number)	Data 2 (Velocity)
Note on	9n	kk	vv
Note off	8n	kk	vv
	9n	kk	00

- "n" indicates channel number.
- Velocity "00" of status "9n" can also be used for note off.

## 5-3-2 Control by system message

System messages to which Model 8330 comply are as listed below. Here, in what way Model 8330 will operate when these messages are received and what format should it follow to transmit, will be explained.

----- [System message classification] -----



### SYSTEM COMMON MESSAGE

#### MTC quarter frame message (Hereafter abbreviated "MTC QF")

MTC QF is a MIDI message representing hour, minute, second, frame and time code type. As each data for hour, minute ... are represented by two MTC QF, a total of eight messages completes one unit of hour, minute, second and frame.

As this message is transmitted in 4 messages to a frame or, in other words, one unit of time value will be formed once for each two frames (if time code type is "ND," it is about 66.7 ms).

#### [RECEIVE]

When time reference is set to "MTC", Model 8330 will read it regardless to its own address setting.

[TRANSMIT]

Model 8330 will transmit MTC QF when the following conditions have all been filled:

- MIDI time code output is set to "ON."
- Time reference is set to other than "TACH & DIR."
- Model G16 is in the play mode and LTC output from Model G16 is being read by Model 8330.

When the above conditions are satisfied, Model 8330 will transmit MTC QF which indicates the time code type (24, 25, ND, DF) and time value of LTC that have been read. If LTC is running in the reverse direction, it will transmit the reverse direction MTC QF.

Whether Model 8330 is reading LTC or not can be confirmed by the internal LTC indicator (1).

UNIVERSAL SYSTEM EXCLUSIVE MESSAGE

MTC full message (Hereafter abbreviated "MTC FM")

In the same way as MTC QF, MTC FM is a message representing the time value and time code type but one unit of hour/minute/second/frame can be sent in one process. This is used, for example, after Model G16 completes locating, then entering the play mode and prior to start transmitting MTC QF, to inform the present position as the initial value to the receiver.

[RECEIVE]

Model 8330 will read the time reference when it is set to "MTC." As MTC FM is designated as device number = 7FH by MIDI specification, Model 8330 will receive this regardless to its own address.

[TRANSMIT]

When the Model 8330 MIDI time code output is set to "ON" and it becomes possible to transmit MTC QF, it will transmit MTC MF once previous to starting transmission of MTC QF (By device number = 7FH).

MTC user bit message (Hereafter abbreviated "MTC UB")

"MTC UB" is a message corresponding to Binary Group No. 1 ~ 8 and Binary Group Flag Bit of the SMPTE time code.

Even though Model 8330 receives this message, it will ignore it. Transmitting (output) of this message is possible only by the Fostex system exclusive message which urges transmission. (It cannot be done by shift operation.)

[TRANSMIT]

MTC UB will be transmitted once upon receiving the Fostex system exclusive message which urges transmission. This content will be identical to LTC user bit which Model 8330 had read last. (It will be transmitted by device number 7FH.) It will be possible to transmit an identical content MTC UB if the user bit is written in the Model 8330 LTC generator, recording it on tape (It can be written using Fostex system exclusive message), playing this back and let it be read by the Model 8330 reader.

MIDI cueing setup message

The setup message is used mainly for the purpose of executing various events such as specifying and executing in hour/minute/second/frame/fractional frame for the punch in/out points, or making Model 8330 and recorders operate in a certain way by the specified cue points.

Device numbers are included in the setup messages. Therefore, if Model 8330 is to receive this, it is necessary for its device number to coincide with the Model 8330 address or Model 8330 must be set in the address free mode. Setup messages to which Model 8330 complies are as in the following.

- Enable event list

[RECEIVE]

When this message is received, Model 8330 can execute the specified event list (Method of specifying explained later.).

This message puts Model 8330 in the "executable condition" and is not triggering the actual operation. To be able to execute the various events, the present time of MTC or LTC read by Model 8330 must coincide with the "hour/minute/second/frame/fractional frame" values written in each event.

Consequently, for conditions in executing the event list, it must be noted that not only is it necessary to receive this message but conditions allowing Model 8330 to read MTC or LTC, such as time reference other than "TACH & DIR" must also be setup.

Event time field in this message will be ignored by Model 8330.

[TRANSMIT]

Model 8330 cannot transmit this message.

- Disable event list

[RECEIVE]

When this message is received, it will become impossible for Model 8330 to execute the specified event list (Method of specifying explained later.).

This message puts Model 8330 in the "non-executable condition" and is not to erase each event from the list. Each event can be executed again after receiving the enable event list.

Event time field in the message will be ignored by Model 8330.

[TRANSMIT]

Model 8330 cannot transmit this message.

- Clear event list

[RECEIVE]

All specified event list (Method of specifying explained later) will be erased upon receiving this message.

Event time field in this message will be ignored by Model 8330.

[TRANSMIT]

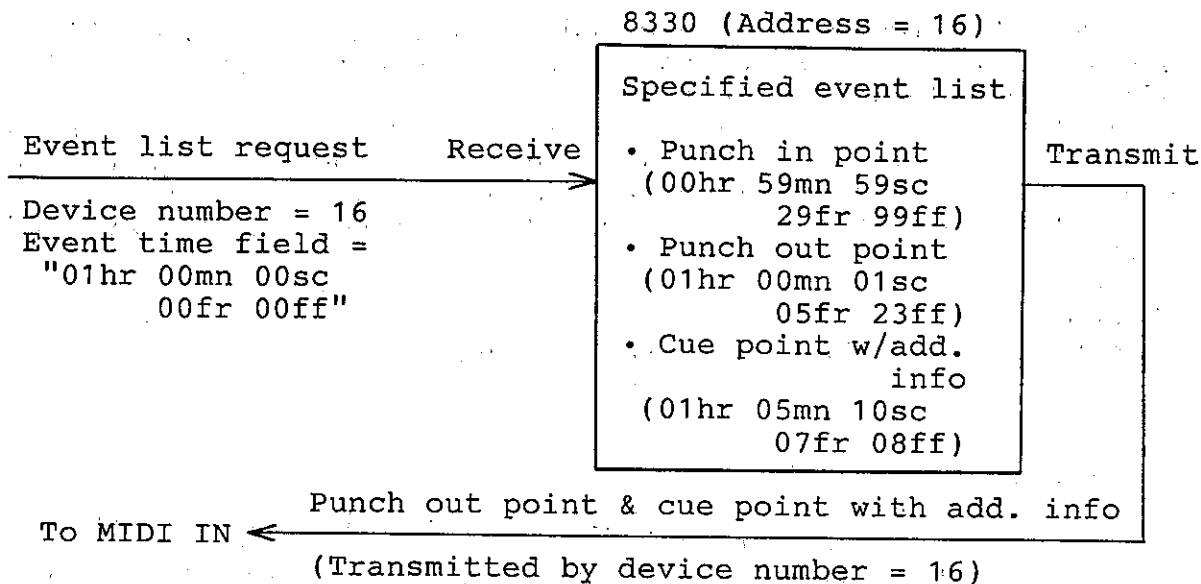
Model 8330 cannot transmit this message.

- Event list request

[RECEIVE]

When this message is received, Model 8330 will transmit in the setup message format, the entire event list succeeding the time values specified by the event time field in this message.

----- Operating example at receiving -----



\* hr=hour, mn=minute, sc=second, fr=frame, ff=fraction frame

NOTE: When there is no event list specified in Model 8330 or no event exists succeeding the time value specified by the event time field, Model 8330 will not transmit anything even though it receives this message.

[TRANSMIT]

Model 8330 cannot transmit this message.

- Punch in point

[RECEIVE]

When this message is received, Model 8330 can make Model G16 punch in at the point (time value) specified by the event time field in this message. This message is for specifying the punch in "point" and is not to trigger the actual operation. For actual execution of punch in, Model 8330 must receive enable event list to enter the "executable condition" and, at the same time, present time of the MTC or LTC read by Model 8330 must coincide with the event time field "hour/minute/second/frame/fractional frame" in this message.

Event numbers (total two bytes of sl and sm) in this message are acknowledged as track numbers in which punch in is to be executed as shown below.



	sl (Lower 7 bits)	sm (Upper 7 bits)
Track 1	01	00
Track 2	02	00
↓	↓	↓
Track 15	0F	00
Track 16	10	00

- Total 14 bits of sl, sm (Binary).
- Numbers are hexadecimal.
- For the values of sl and sm, any data in other than this combination will be ignored by Model 8330.

What can be specified by one message is one time value and one track number. Therefore, when it is desired to punch in on multiple tracks by the same time values, event time field must be the same and, at the same time, multiple messages of different "sl" values must be transmitted to Model 8330.

NOTE: Only one punch in point time value can be stored in the Model 8330 memory. Therefore, multiple tracks can be specified in the same point as shown above, but multiple number of punch in points whose event time field content are different cannot be setup. If messages of different time values are received, it must be noted that punch in points setup up to that point will be cleared.

[TRANSMIT]

When event list request is received, Model 8330 will transmit (at sm=00H) this corresponding message once. Refer to above "Event list request" for details.

- Punch out point

[RECEIVE]

When this message is received, Model 8330 will be able to make Model G16 punch out at the point (time value) specified by the event time field in this message. Conditions at punch in execution, handling of the event number and other precautions are all identical with explanations for punch in point.

[TRANSMIT]

Identical with the punch in point explanation.

- Delete punch in point

[RECEIVE]

When this message is received, Model 8330 acknowledges the event time field and event number value in this message and deletes the punch in point which is identical to it.

In short, it picks out the same time value and track, specified in this message from among the punch in points specified,

and deletes it.

[TRANSMIT]

Model 8330 cannot transmit this message.

- Delete punch out point

[RECEIVE]

When this message is received, Model 8330 acknowledges the event time field and event number value in this message and deletes punch out points which are the same.

In other words, among the specified punch out points, identical time values and tracks specified in this message are picked out and the punch out points erased.

[TRANSMIT]

Model 8330 cannot transmit this message.

- Cue point with additional information

This message possesses bytes representing "additional information" succeeding the event time field and event number. These are MIDI data composed in 4 bit lots and are included in this message, for example, as shown below.

Example: When sending note on message "91 30 7F" as additional information.

Additional information = "01 09 00 03 0F 07"

- \* In regards to Model 8330, additional information in this example has the meaning of "PLAY Model G16." (Refer to "Normal operation" in Note on/Note off.)

[RECEIVE]

When this message is received, Model 8330 will be able to go through the operation indicated by the additional information at the point (time value) specified in the event time field in this message.

In the case of the above example, it becomes possible to enter Model G16 in PLAY at the specified point (Accurate auto start based on LTC and MTC is possible.)

If event number (Total two bytes of s1 and sm) in the message is other than "00H 00H," Model 8330 will ignore this message.

This message is for specifying the "executing point" of the operation indicated by the additional information and is not for triggering the actual operation. In order to actually execute this operation, Model 8330 must receive the enable event list to put it in the "executable condition," and at the

same time, present time of the MTC or LTC must coincide with the "hour/minute/second/frame/fractional frame" of the event time field in this message.

NOTE: Only one cue point with additional information can be stored in the memory of Model 8330. Therefore, multiple cue points with additional information, whose content is different from the event time field and additional information, cannot be setup. When a new message is received, it must be noted that cue points with additional information setup up to that point will be cleared.

[TRANSMIT]

When the event list request is received, Model 8330 will transmit (by 00H for both sl and sm) this corresponding message once. For details, refer to explanations on "Event list request."

- Delete cue point

[RECEIVE]

When this message is received, Model 8330 acknowledges the time value of the event time field and deletes "cue points with additional information" whose values are the same.

In short, time values identical with specified cue points with additional information are erased.

If event numbers (total two bytes of sl and sm) in the message is other than "00H 00H," Model 8330 will ignore this message.

[TRANSMIT]

Model 8330 cannot transmit this message.

IDENTITY REQUEST AND IDENTITY REPLY

Identity request and identity reply are defined as "Inquiry messages" and are used mainly to inquire such as maker ID of the receiving side.

Device numbers are contained in the inquiry message. Therefore, to allow Model 8330 to receive this, either the device number must match with the Model 8330 address or Model 8330 be set to address free mode.

Identity request

[RECEIVE]

Model 8330 immediately transmits an identity reply when it receives this message.

[TRANSMIT]

Model 8330 cannot transmit this message.

Identity reply

[RECEIVE]

Model 8330 will ignore this message even though it is received.

[TRANSMIT]

Model 8330 transmits this message when an identity request is received.

Device number at transmitting will be identical with the Model 8330 address setting (it is transmitted by this value even though Model 8330 is set in the address free mode.)

Various data in the message will be as follows (data written in hexadecimal):

Byte	Definition	Xmitting value	Meaning
mm	System exclusive maker ID code	51	Fostex ID code (Fixed)
ff ff	Family code (Advanced lower bit)	01 00	No meaning (Fixed)
dd dd	Family number code (Advanced lower bit)	03 00	Recorder connected= Model G16
ss ss ss ss	Software version, etc.	01 00 F7 F7	01 00: Ver.#1.0 7F 7F: No meaning (7F 7F are fixed.)

SYSTEM REAL TIME MESSAGE

Timing clock

[RECEIVE]

Model 8330 will ignore this message even though it is received.

[TRANSMIT]

Model 8330 will be able to transmit this message when direct time lock signal output is set to "ON" by the note on/off shift operation. Refer to "Direct time lock signal output ON/OFF setting" for details on conditions in transmitting.

System reset

[RECEIVE]

Model 8330 will enter in default when this message is received.

[TRANSMIT]

Model 8330 cannot transmit this message.

Auxiliary informations - Byte composition of system messages

Byte composition of system messages to which Model 8330 complies to are listed below.

- MTC QF (2 byte/transmit-receive permissible)

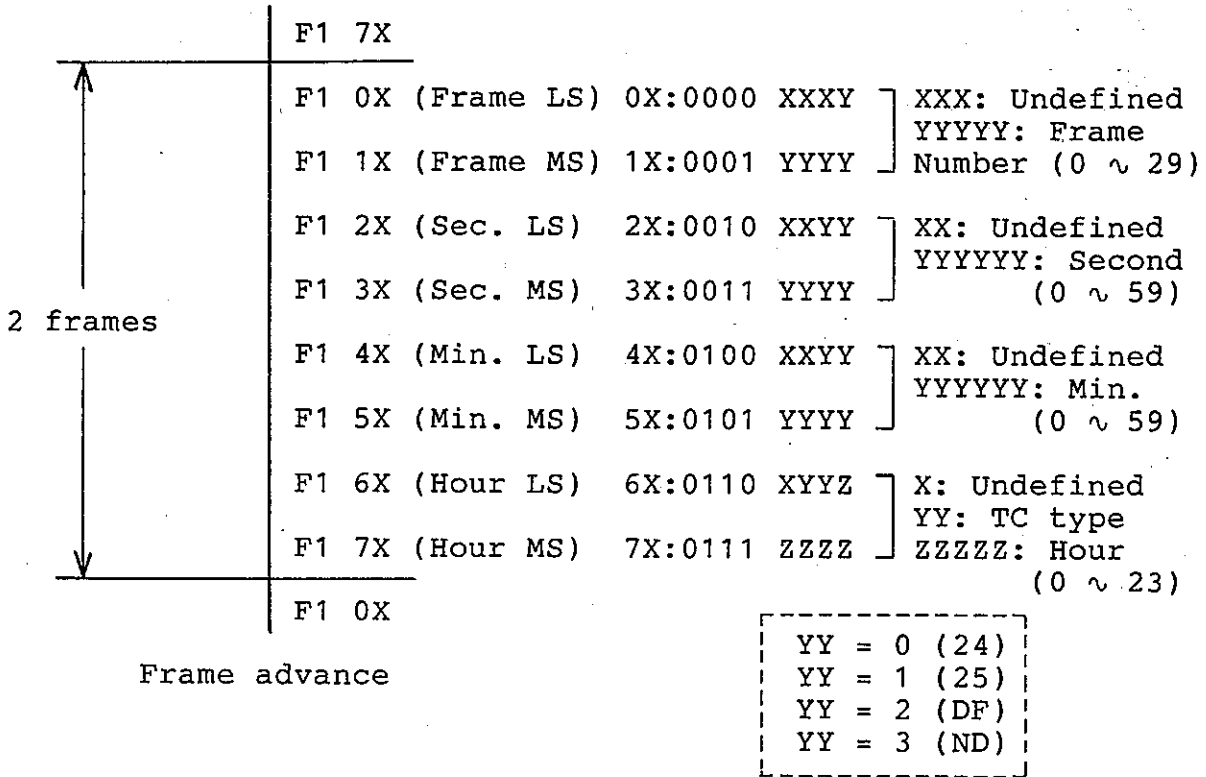
F1 <message>

F1: System common message status byte  
<message> : 0nnndddd

nnn: Indicates message type as shown below.  
dddd: 4 bit binary data of each.

nnn = 0: Frame LS
nnn = 1: Frame MS
nnn = 2: Second LS
nnn = 3: Second MS
nnn = 4: Minute LS
nnn = 5: Minute MS
nnn = 6: Hour LS
nnn = 7: Hour MS and time code type

----- Transmitting pattern of MTC QF -----



Example: When 01hr 35mn 49sc 18fr is converted to MTC QF (time code type is ND):

F1	02	
F1	11	12H = Decimal 18 frames
F1	21	
F1	33	31H = Decimal 49 seconds
F1	43	
F1	52	23H = Decimal 35 minutes
F1	61	
F1	76	01H = Decimal 01 hour

(ND → As bit 5 and 6 (YY) will be 1 and 1, it will be "6.")

- MTC FM (10 bytes/transmit-receive permissible)

F0	7F	7F	01	01	hr	mn	sc	fr	F7
----	----	----	----	----	----	----	----	----	----

F0 7F: Universal system exclusive real time header  
 7F : Device number (Fixed)  
 01 : Sub ID #1 (MIDI time code)  
 01 : Sub ID #2 (Full message)  
 hr : Time/time code type (0YYZZZZZ)

YY = 0 (24)  
 YY = 1 (25)  
 YY = 2 (DF)  
 YY = 3 (ND)  
 ZZZZ = Hour (0 ~ 23)

mn : Minute (0 ~ 59)  
 sc : Second (0 ~ 59)  
 fr : Frame (0 ~ 29)  
 F7 : End of exclusive

- MTC UB (15 byte/transmit only is possible)

F0	7F	7F	01	02	u1	u2	u3	u4	u6	u7	u8	u9	F7
----	----	----	----	----	----	----	----	----	----	----	----	----	----

F0 7F: Universal system exclusive real time header  
 7F : Device number (Fixed)  
 01 : Sub ID #1 (MIDI time code)  
 02 : Sub ID #2 (User bit message)

u1 : 0000aaaa  
 u2 : 0000bbbb  
 u3 : 0000cccc  
 u4 : 0000dddd  
 u6 : 0000eeee  
 u7 : 0000gggg  
 u8 : 0000hhhh  
 u9 : 000000ii

Equivalent to binary group 1 ~ 8 of SMPTE time code

Equivalent to binary group flag bit

F7 : End of exclusive

- Enable event list

F0	7E	<ch>	04	00	**	**	**	**	**	01	00	F7
----	----	------	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header  
 <ch> : Device number  
 04 : Sub ID #1 (MIDI cueing setup message)  
 00 : Sub ID #2 (Special)  
 \*\*~\*\* : Event time field (Model 8330 will ignore this)  
 01 00: Event number (Enable event list)  
 F7 : End of exclusive

- Disable event list (13 byte/receive only is possible)

F0	7E	<ch>	04	00	**	**	**	**	**	02	00	F7
----	----	------	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header  
 <ch> : Device number  
 04 : Sub ID #1 (MIDI cueing setup message)  
 00 : Sub ID #2 (Special)  
 \*\*~\*\* : Event time field (Model 8330 will ignore this)  
 02 00: Event number (Enable event list)  
 F7 : End of exclusive

- Clear event list (13 byte/receive only is possible)

F0	7E	<ch>	04	00	**	**	**	**	**	03	00	F7
----	----	------	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header  
 <ch> : Device number  
 04 : Sub ID #1 (MIDI cueing setup message)  
 00 : Sub ID #2 (Special)  
 \*\*~\*\* : Event time field (Model 8330 will ignore this)  
 03 00: Event number (Clear event list)  
 F7 : End of exclusive



- Event list request (13 byte/receive only is possible)

F0	7E	<ch>	04	00	hr	mn	sc	fr	ff	05	00	F7
----	----	------	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header

<ch> : Device number  
 04 : Sub ID #1 (MIDI cueing setup message)  
 00 : Sub ID #2 (Special)  
 hr : Time/time code type (0YYZZZZZ)

YY = 0 (24)  
 YY = 1 (25)  
 YY = 2 (DF)  
 YY = 3 (ND)  
 ZZZZZ = Hour (0 ~ 23)

mn : Minute (0 ~ 59)  
 sc : Second (0 ~ 59)  
 fr : Frame (0 ~ 29)  
 ff : Fractional frame (0 ~ 99)  
 05 00: Event number (Event list request)  
 F7 : End of exclusive

- Punch in point (13 byte/transmit-receive is possible)

F0	7E	<ch>	04	01	hr	mn	sc	fr	ff	sl	sm	F7
----	----	------	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header

<ch> : Device number  
 04 : Sub ID #1 (MIDI cueing setup message)  
 00 : Sub ID #2 (Special)  
 hr : Time/time code type (0YYZZZZZ)

YY = 0 (24)  
 YY = 1 (25)  
 YY = 2 (DF)  
 YY = 3 (ND)  
 ZZZZZ = Hour (0 ~ 23)

mn : Minute (0 ~ 59)  
 sc : Second (0 ~ 59)  
 fr : Frame (0 ~ 29)  
 ff : Fractional frame (0 ~ 99)  
 05 00: Event number (Specifying track No. Refer to list.)  
 F7 : End of exclusive

	sl (Lower 7 bit)	sm (Upper 7 bit)
Track 1	01	00
Track 2	02	00
↓	↓	↓
Track 15	0F	00
Track 16	10	00

- Total 14 bits of sl, sm (binary)
- Numbers in hexadecimal
- Model 8330 will ignore this message when data in a combination other than these are received for the sl and sm values.

- Punch out point (13 byte/transmit-receive is possible)

F0 7E <ch> 04 02 hr mn sc fr ff sl sm F7
--

- \* All are same as the punch in points other than sub ID #2 which will be "02."

- Delete punch in point (13 byte/receive only is possible)

F0 7E <ch> 04 03 hr mn sc fr ff sl sm F7
--

- \* All are same as the punch in points other than sub ID #2 which will be "03."

- Delete punch out point (13 byte/receive only is possible)

F0 7E <ch> 04 04 hr mn sc fr ff sl sm F7
--

- \* All are same as the punch in points other than sub ID #2 which will be "04."

- Cue point with additional information (13 byte + additional information/transmit-receive is possible)

```
F0 7E <ch> 04 0C hr mn sc fr ff 00 00
<Nibblized MIDI data> F7
```

F0 7E: Universal system exclusive non real time header

<ch> : Device number

04 : Sub ID #1 (MIDI cueing setup message)

0C : Sub ID #2 (Cue point with additional information)

hr : Time/time code type (0YYZZZZ)

YY = 0 (24)

YY = 1 (25)

YY = 2 (DF)

YY = 3 (ND)

ZZZZZ = Hour (0 ~ 23)

mn : Minute (0 ~ 59)

sc : Second (0 ~ 59)

fr : Frame (0 ~ 29)

ff : Fractional frame (0 ~ 99)

00 00: Event number (Fixed)

<Nibblized MIDI data>: Additional information by MIDI data  
split composed in 4 bits.

F7 : End of exclusive

----- Example: Stop recorder when LTC or MTC being read -----  
arrives at "10hr 46mn 28sc 27fr 63ff"  
(Assuming Model 8330 address = 16)

```
F0 7E 0F 04 0C 0A 2E 1C 1B 3F 00 00
```

10hr 46mn 28sc 27fr 63ff

```
0F 09 0C 03 0F 07 F7
```

<Nibblized MIDI data>

4 bit converted "9F 3C 7F"

(Note on message meaning STOP)

- Delete cue point (13 byte/receive only is possible)

```
F0 7E <ch> 04 0D hr mn sc fr ff 00 00 F7
```

\* It is the same with cue point with additional information except for sub ID #2 which will be "0D" and that there is no <nibblized MIDI data>.

- Identity request (6 byte/receive only is possible)

F0	7E	<ch>	06	01	F7
----	----	------	----	----	----

F0 7E: Universal system exclusive non real time header  
<ch> : Device number  
06 : Sub ID #1 (Inquiry message)  
01 : Sub ID #2 (Identity request)  
F7 : End of exclusive

- Identity reply (15 byte/Transmission only is possible)

F0	7E	<ch>	06	02	51	01	00	dd	00	01	00	7F	7F	F7
----	----	------	----	----	----	----	----	----	----	----	----	----	----	----

F0 7E: Universal system exclusive non real time header  
<ch> : Device number  
06 : Sub ID #1 (Inquiry message)  
01 : Sub ID #2 (Identity reply)  
51 : System exclusive maker ID code (Fostex ID)  
01 00: Family code (Fixed to this value in Model 8330)  
dd 00: Family number code (Note 1)  
01 00 7F 7F: Software version, etc. (Note 2)  
F7 : End of exclusive

Note 1: dd = Indicates recorder connected.

For recorder Model G16: dd = 03

\* Model 8330 is exclusive to Model G16.

Note 2: 01 00: This means Ver. 1.0.

7F 7F: Fixed.

- Timing clock (1 byte/Transmission only is possible)

F8
----

\* This is transmitted once for each frame when direct time lock signal output is ON.

- System reset (1 byte/receive only is possible)

FF
----

\* Model 8330 will enter default when this is received.

## 6. SPECIFICATIONS

### LTC reader

Connector : RCA pin jack  
Input impedance : 10K $\Omega$  or higher  
Input level : 300mV p-p  $\sim$  10V p-p  
Readable speed range: 1/30  $\sim$  30 times in forward/reverse

### LTC generator

Connector : RCA pin jack  
Load impedance : 10K $\Omega$  or higher  
Output level (adjustable) : Maximum 3V p-p  
Frame mode : 24, 25, drop frame, non drop frame, 30. These can be set by the 2nd mode.

### MIDI IN/THRU/OUT

Connector and electrical specs. : Complies to MIDI specifications.  
"IN" : Input to Model 8330.  
"THRU" : Signals input to "IN" is waveform shaped and output here.  
"OUT" : This is the Model 8330 output.

### Communication Connector

: DSUB 9P

### Power supply

: Supplied by Model G16.

### Physical dimensions

: 205(W) x 303(H) x 35(D) (mm)

### Weight

: 1.4kg.

Function ...	Transmitted	Recognized	Remarks
Basic Channel Default Changed	X X	1-16 1-16	Note 1
Mode Default Messages Altered	X X *****	Omni ON/OFF Omni ON/OFF X	Note 1
Note Number : True voice	X *****	36-84	
Velocity Note ON Note OFF	X X	X X	
After Touch key's Ch's	X X	X X	
Pitch Bend	X	X	
Control Change	X	X	
Prog Change : True #	X *****	X X	
System Exclusive	○ Note 2	○ Note 3	
Common : Song Pos : Song Sel : Tune	X X X	X X X	Note 4
System Real Time : Clock : Commands	○ X	X X	
Aux Messages : Local ON/OFF : All Notes OFF : Active Sense : Reset	X X X X	○ ○ X ○	
Notes	Note 1: Enters condition set by 2nd mode. Note 2: MTC(FM,UB,Cueing), Identity Reply, FOSTEX Exclusive, Direct Time Lock Note 3: MTC Cueing, Identity Request, FOSTEX Exclusive Note 4: Transmission of MTC QF		

Mode 1 : OMNI ON, POLY  
 Mode 3 : OMNI OFF, POLY

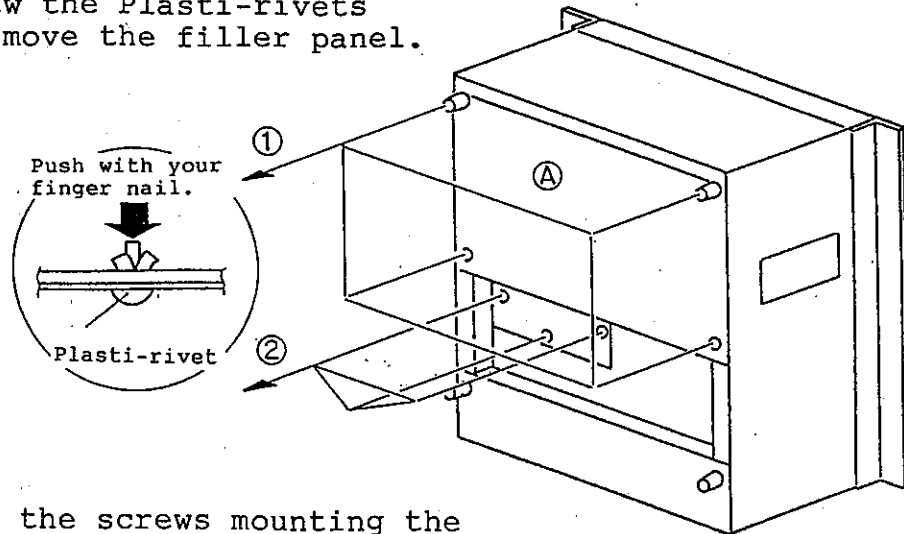
Mode 2 : OMNI ON, MONO  
 Mode 4 : OMNI OFF, MONO

○ : Yes  
 X : No

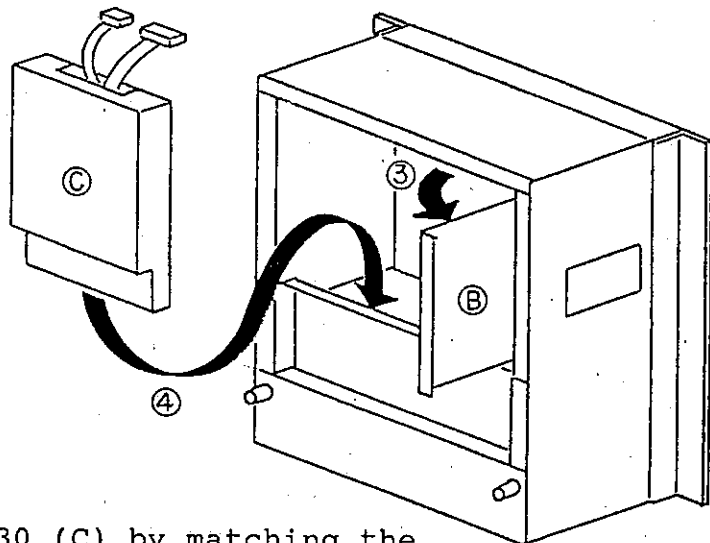
<AUX 2>

<< INSTRUCTION FOR INSTALLING THE  
MODEL 8330 SYNCHRONIZER IN THE MODEL G16 >>

- 1) Remove the rear cover (A) by removing the screws and foots.
- 2) Unscrew the Plasti-rivets and remove the filler panel.



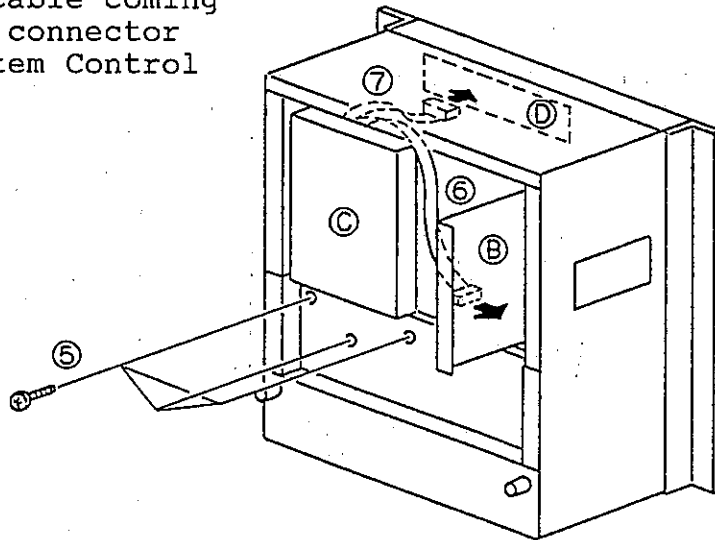
- 3) Remove the screws mounting the System Control PCB Assy (B) and swing it outward 90° for easy installation of Model 8330.



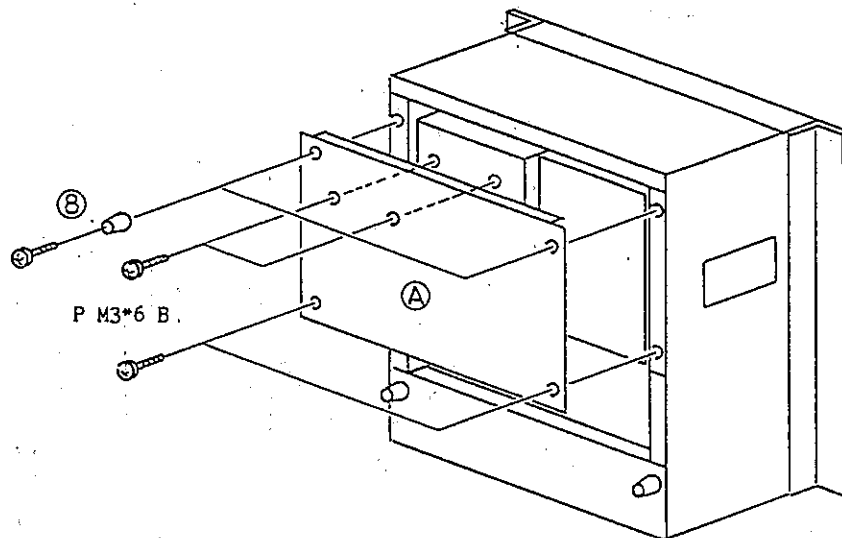
- 4) Install Model 8330 (C) by matching the row of connectors at bottom with their access opening in the rear panel.

5) Mount Model 8330 in Model G16 with screws, PTP 3\*8 B supplied with Model 8330.

6) Connect the 9 pin cable coming from Model 8330 to connector No. J21 on the System Control PCB Assy (B).



7) Connect the 5 pin cable coming from Model 8330 to connector No. J11 on the Regulator PCB Assy (D).



8) Put the rear cover (A) back to Model G16 with the screws and foots previously removed and also the screws, P M 3\*6 B supplied with Model 8330.



---

#### PRECAUTIONS IN SAFETY

---

- Installation of Model 8330 in Model G16 will be done by the Fostex Service Stations. After it is installed, do not remove the protective cover and touch anything inside.
- For other notices, please refer to "Precautions in safety" in the Model G16 Manual.

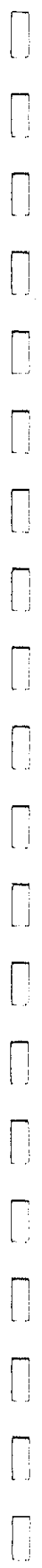
---

#### AFTER SERVICE

---

- Repair and maintenance parts of this product (parts necessary to maintain performance of the product) will be stocked for a minimum 6 years after discontinuation of production. This period is determined by the Ministry of Commerce and Industry.





**Fostex**

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Model 8330  
SYNCHRONIZER CARD  
Owner's Manual Supplement  
for Software Version 1.10

---



- The new software version is titled 1.10 ; it complies to RS-422A specifications.

### 1. Compliance to RS-422A

The communication ability has been enhanced by complying to the RS-422A Sony audio protocol. It is switched from "MIDI" to "RS-422A" by using the 2nd mode function.

### 2. Connector

Communication port (15) (9 pin D-SUB connector)

### 3. 2nd mode function

To switch from MIDI to RS-422A (LISTEN) by the 2nd [6] [0] <Communication> mode ("5 . a " means Serial I/O).

#### --- Operating guide -----

2nd [6] [0]	[5 . a . d . ]*
↓	
Select by [ . ] -----	[5 . a . d . ] : MIDI
↓	[5 . a . 422 . ] : RS-422A (LISTEN)
[STO]	

### 4. Specifications

#### • Communication

Connector : D-SUB 9P  
Electrical specifications : Complies to RS-422A

Quick reference chart of 2nd mode function

“\*” indicates default value.

Command key	Function	Display	Operation	Key	Page
[6] [3]	Address	RDCH 01	01* ~ 16	[n]	32
[6] [4]	Address free mode	AdFr 0F	on/off*	[.]	32
[AUTO REC]	Auto spot erase	SP7 REHA	Rehearsal#/take	[.]	30
[7] [5]	Auto spot erase	SP7ROL :	1* ~ 9sec	[n]	31
[6] [5]	Channel voice message	CHVC 0F	on/off*	[.]	32
[2] [6]	Chase master control	CHSAC 0F	on/off*	[.]	26
[1] [8]	Chase window	Ch.Wnd 4	1 ~ 9sec :4*	[n]	24
[2] [4]	Code mode	Code LTC	LTC*/VP/P1/P2	[.]	27
[2] [5]	Code only master	COARS 0F	on/off*	[.]	25
[6] [0]	Communication	Sto Ad.	MIDI*/RS-422A	[.]	32
[2] [1]	Direction signal	Ed. r d. r	Direction*/tally	[.]	23
[0] [9]	Frame mode: EXT	EFrā 24	24*/25/DF/30	[.]	28
[1] [0]	Frame mode: INT	.FRā 24	24*/25/DF/30	[.]	27
[7] [3]	Generator frame mode	GFā d 24	24*/25/DF/30/nDF	[.]	29
[7] [2]	Generator mode	Gā d THRU	Thru*/sweep/skip/ free run	[.]	28
[5] [2]	Learning of tach pulse	TRCLEAR n	Execute by [ST0]		23
[1] [7]	Lock damping	LoPdAP 0	0* ~ 9	[n]	25
[2] [0]	Lock mode	Lā d RUB 0	frame/auto*/sync	[.]	21
[0] [2]	Machine select	ā RC nor	nor*/D-20	[.]	24
[8] [7]	Memory copy(S→G)	ā CPY S_G	Execute by [ST0]		33
[8] [8]	Memory copy(G→S)	ā CPY G_S	Execute by [ST0]		33
[8] [9]	Memory initialize	ā Eā . n . 7	Execute by [ST0]		33
[2] [7]	No tach pulse mode	noTP 0F	on/off*	[.]	26
[5] [1]	Offset auto REC	o-REC 0F	on/off*	[.]	29
[1] [3]	Play to park	PRP 0	0* ~ 9sec	[n]	29
[1] [6]	Post roll time	PS7ROL 0	0* ~ 9sec	[n]	31
[1] [4]	Slave park & start (on/off)	PP-SP on	on*/off	[.]	21
[1] [5]	Slave park & start (set up)	SP. 10PP.20.	0 ~ 99F PP=20F, SP=10F*	[n]	22
[2] [3]	Slave wait	S-BA7 0F	on/off*	[.]	24
[0] [0]	Soft version	VER S 100			32
[9] [0]	Synchronizer	SPnC on	on*/off	*1	20
[8] [1]	Tape speed	.SPd 100	INT*/EXT	[.]	26

\*1 This command only will change condition each time it is executed.



## FOSTEX Model 8330

### SYNCHRONIZER CARD

#### FOR THE G-SERIES MULTITRACK RECORDERS

### Owner's Manual Supplement for Software Version 1.20

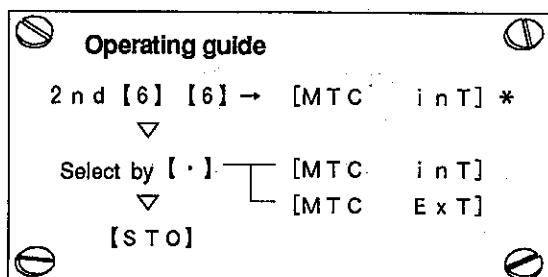
The following information is an update to the manual supplied with the 8330 manual and pertains to the software update to version 1.20. All other functions of the 8330 are the same as described in the original manual. If you have any comments, please do not hesitate to contact your nearest Fostex service center. Our technicians will be happy to help you.

#### Second Mode Additions

Using the V1.20 software, there have been two functions added to the 2nd mode.

#### 1. Setting of Source LTC when converting MTC from LTC

The 8330 can convert LTC to MTC (MIDI time code) and output this information from the MIDI OUT connection. Previously, the source LTC was only INT LTC (G-series output). In addition, EXT LTC can be selected through the 2nd mode.



#### Selecting INT

In this mode, if the G-series recorder (slave) is in PLAY or REC/PLAY, the 8330 will convert any LTC from the time code input jack [CODE IN] to MTC and output this code at the MIDI OUT jack.

#### Selecting EXT

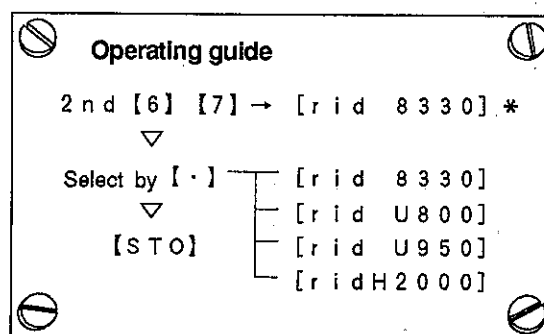
If the recorder (master) is in PLAY or REC/PLAY, the 8330 will convert any LTC that is input at the code/video input [CODE IN/VIDEO IN] and convert it to MTC. This information will also be output at the MIDI OUT jack.

#### <NOTE>

The CODE ONLY MASTER function allows the 8330 to read the LTC only and not the tally signal. In this case, normally, this is "on" when using the recorder as the master. When using other TC equipment such as a 4010 time code generator, turn off the C.O.M function.

#### 2. Settings of the Device Type

Use this 2nd mode to answer the "00.11: DEVICE TYPE REQUEST" command from the editor. Device type numbers are decided own identification either by "company" or by "product" ID.



#### <NOTES>

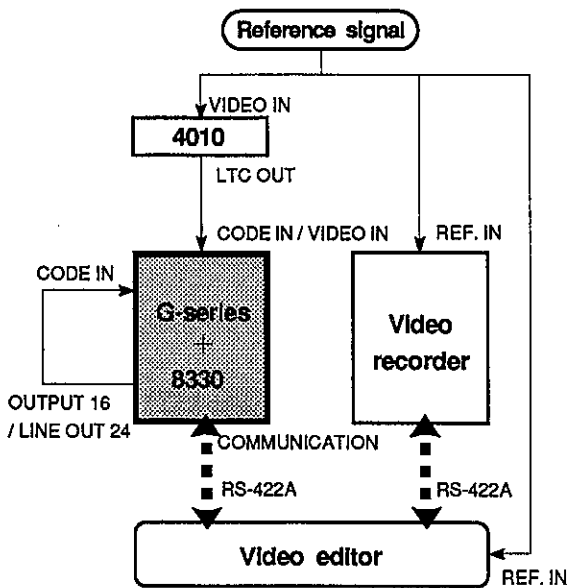
- "\*" indicates default.
- "rid" means return ID.
- U800, U950, H2000 etc. are the IDs that each Sony video recorder has.

## RS-422A Interface

Because the 8330 use Sony's "9PIN PROTOCOL", those G-series recorders using an 8330 card can be connected to Sony video editors as follows:

### Connections

The following is an example of a typical connection format for the G-series in an video editing suite.



### Mode Settings

The following are the various mode settings using the 2nd mode.

#### ■ Set up "Communication"

2nd [ 6 ] [ 0 ]—Select the "422L" by using the [ . ] key.

#### ■ Set up "Device Type"

2nd [ 6 ] [ 7 ]—Select the "U950" by using the [ . ] key.

#### ■ Set up "Code Mode"

2nd [ 2 ] [ 4 ]—Select the "LTC" by using the [ . ] key.

#### ■ Set up "Lock Mode"

2nd [ 2 ] [ 0 ]—Select the "SYNC" by using the [ . ] key.

#### ■ Set up "Code Only Master"

2nd [ 2 ] [ 5 ]—Select "ON" by using the [ . ] key.

### Operation

1. Input the reference video signal (house synch signal, output of pattern generator, etc.) to the external sync input of each piece of equipment. In addition, input the REF. IN of the video editor.
2. Input the LTC that is synchronized to the reference video signal to the CODE IN/VIDEO IN jack of the 8330.
3. Input the LTC that has been recorded on the tape of the G-series to the 8330 CODE IN jack.
4. Put the G-series recorder into PLAY mode and input LTC. The 8330 will learn the tach pulse rate.
5. After the learning mode of the 8330 is completed, enter the LOCK ON mode by pressing the **LOCK ON/CHASE ON** button.

**IMPORTANT:** This button has two functions. Do not enter the CHASE ON mode. This mode is for "chasing" while disregarding editor commands.

#### < NOTE >

As of April 1991, the following equipment responds to these commands:

<b>Editors:</b>	Sony	RM-450, BVE-900
	Panasonic	AG-A800
	CMX	CMX300
<b>Recorders:</b>	Sony	BVU-950, BVW-75

### Additions to the Error Indications

Software version 1.20 has one addition to the error indications.

#### "FMODErr"

When the frame mode is different between the INT LTC and the EXT LTC and you enter the LOCK mode, the G-series recorders will indicate "FMODErr".