# APPENDIX

**\<Operation manual for the recorder with the Model 8346 TC/SYNC card installed\>**

This appendix is the operation manual for the recorder with the Model 8346 TC/SYNC card installed.

### \<Installation of the optional card\>

The TC/SYNC card should be installed into the recorder at a FOSTEX service station.  Do not try to install the card by yourself.  Ask your local FOSTEX dealer for the installation after purchasing the Model 8346.
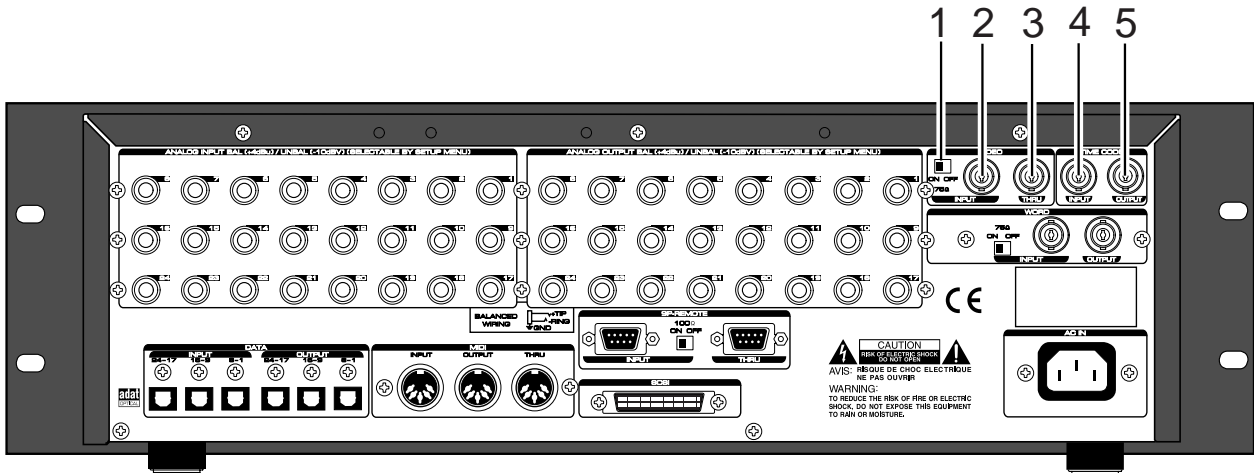
### \<Notes when requesting the installation\>

There is the possibility of damaging the hard disk when transporting the recorder.  Before transporting the recorder to our service department for the installation of the TC/SYNC card, remove the hard disk from the recorder. Be sure to keep the removed hard disk carefully.

# Contents of Appendix

## Names and Functions



### 1. [VIDEO IN] termination switch
**(75Ω termination ON/OFF)**
Used to terminate the VIDEO INPUT signal and usually set to ON.

### 2. [VIDEO IN] connector (BNC connector)
Receives an external video sync signal (interlace or composite) when synchronizing the recorder to a video sync signal.

### 3. [VIDEO THRU] connector (BNC connector)
Outputs the video sync signal received from the VIDEO INPUT connector.

### 4. [TIME CODE INPUT] connector
**(BNC connector)**
Receives external time code (LTC).

### 5. [TIME CODE OUTPUT] connector
**(BNC connector)**
Outputs an LTC from the recorder (equivalent to the MTC displayed on the panel) or time code from the internal TC generator.

## Introduction

The Model 8346 is a TC/SYNC card designed as an option for digital multitrack recorders.

By installing the TC/SYNC card into the recorder, the recorder can synchronize to external LTC or video signal, as well as an external word clock.

So you can use the recorder synchronized with video machines in video post production studios where the synchronization between audio and video is indispensable, or make digital sound recordings in a system using a digital mixing console.

## Additional features

By installing the Model 8346 into the recorder, the following SETUP menus and GEN setup function are added. These SETUP menus are used when the recorder is synchronized to an external LTC or locked to a video signal.

### 1. SETUP mode "Ref. TC?" menu

This menu selects the reference time code used as a master time code for the recorder.

The reference time code can be selected between MTC (MIDI time code) and LTC according to the incoming time code. The default setting after formatting a disk is "**LTC**".

### 2. SETUP mode "Clock Sel?" menu

This menu selects the reference clock of the recorder with the 8346.

If the 8346 is not installed, you can select the reference clock from "**Int**," "**Auto**" and "**Word**".

If the 8346 is installed, "**Video**" also can be the reference clock in addition to the three options above.

### 3. SETUP mode "Sync Preset?" menu

This menu is effective when the recorder with the 8346 installed is used in sync with a digital mixing console.

You can select from some preset options according to your system to get the best synchronization performance.

### 4. SETUP mode "Virtual LTC?" menu

This menu selects whether recording/playback of the virtual LTC is enabled or disabled. The default setting is "**Ena.**" (Enabled).

### 5. SETUP mode "Offset Disp?" menu

This menu selects whether or not displaying the real offset between the incoming reference time code (LTC or MTC) and the displayed MTC (output LTC).

The real offset is displayed instead of REMAIN when displaying the MTC.

### 6. GENERATOR setup functions

The GENERATOR setup functions allows recording/erasing an external or internal (generator) time code, force-jamming to external time code, setting the LTC output, and setting the chase offset value between incoming time code and the MTC.

## Operations for the additional SETUP menu

### • "Ref. TC?" menu setting

**1. Turn on the power of the recorder.**

**2. Press the [SETUP] key while the recorder is stopped to show the SETUP menu.**

**3. Select the "Ref. TC?" menu by using the Jog dial and press the [EXECUTE/YES] key.**
The reference time code currently selected starts flashing (the default reference time code setting when the Model 8346 is installed is "**LTC**").
The outlined box surrounds the flashing item on the display.



Flashing
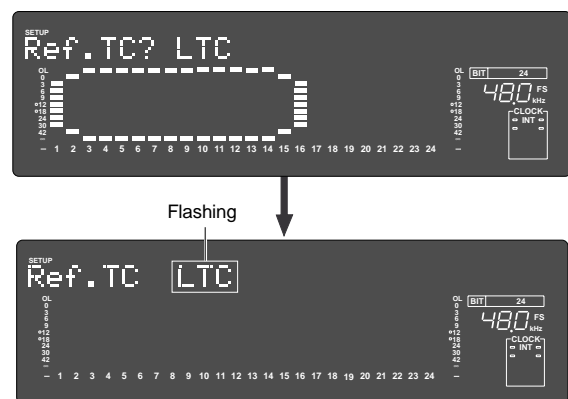
**4. Select the reference time code by using the Jog dial.**
You can select between "**LTC**" and "**MTC**" (MIDI time code).

**5. After selecting the reference time code, press the [EXECUTE/YES] key.**
The selected reference time code is confirmed (set) and the display changes to the similar one to the upper example in step 3 above where "**?**" flashes.

**6. Press the [EXIT/NO] key (or the [STOP] button) to exit the SETUP mode.**

You can check the time information of the incoming reference time code in the front panel display of the recorder.
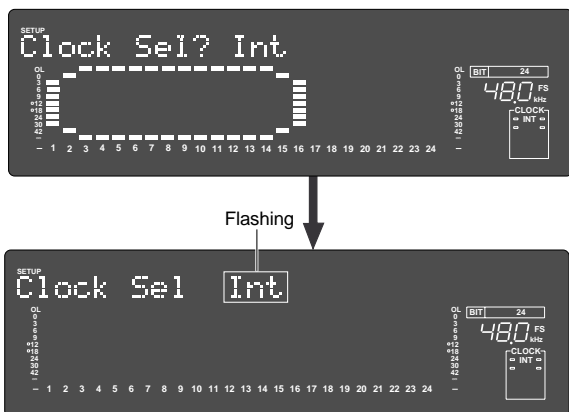See "**Chase sync to external time code**" below for details.

## • "Clock Sel?" menu setting

**Execute step 1 and 2 in "Ref. TC ?" menu setting" described above.**

**3. Select the "Clock Sel?" menu by using the Jog dial and press the [EXECUTE/YES] key.**
The reference clock currently selected starts flashing (the default reference clock setting when the Model 8346 is installed is "**INT**").

Flashing

**4. Select the desired reference clock by using the Jog dial.**
You can select from "**Auto**," "**Word**" and "**Video**" as well as "**Int**". The following table shows the function of each option.

| Reference clock | Function |
|---|---|
| **Auto** | The reference clock is automatically selected from among available clocks according to the following order of priority; Word, Video and Int. |
| **Int** | The 8346 references to the internal clock. |
| **Word** | The 8346 references to an external word clock. |
| **Video** | The 8346 references to an external video clock. |

**5. After selecting the reference clock, press the [EXECUTE/YES] key.**
The selected reference clock is confirmed (set) and the display changes to the similar one to the upper example in step 3 above where "**?**" flashes.
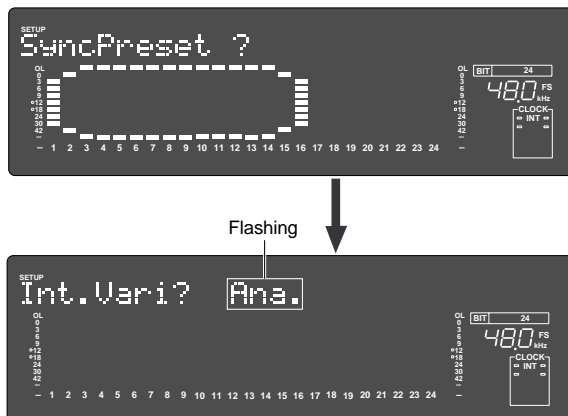
**6. Press the [EXIT/NO] key (or the [STOP] button) to exit the SETUP mode.**

## • "Sync Preset?" menu setting

**Execute step 1 and 2 in "Ref. TC ?" menu setting" described earlier.**

**3. Select the "Sync Preset ?" menu by using the Jog dial and press the [EXECUTE/YES] key.**
The sync preset setting currently selected is shown (the default setting when the Model 8346 is installed is "**Int. Vari? Ana.**").

Flashing

**4. Select the desired sync preset combination by using the Jog dial from the followings;**
The following table shows the function of each preset.

| Preset item | | D. in ? setting | 8345 Clock | Slave Type |
|---|---|---|---|---|
| **Int. Vari** | **Ana.** | Not assigned | Int | Vari |
| | **adat** | adat ;Async | | |
| **Int. Free** | **Ana.** | Not assigned | Int | Free |
| | **adat** | adat ;Async | | |
| **Word Free** | **Ana.** | Not assigned | Word | Free |
| | **adat** | adat ;Async | | |
| **Video Vari** | **Ana.** | Not assigned | Video | Vari |
| | **adat** | adat ;Async | | |
| **Video Free** | **Ana.** | Not assigned | Video | Free |
| | **adat** | adat ;Async | | |

**5. After selecting the preset, press the [EXECUTE/YES] key.**
The selected preset is confirmed (set) and the display changes to the similar one to the upper example in step 3 above where "**?**" flashes.
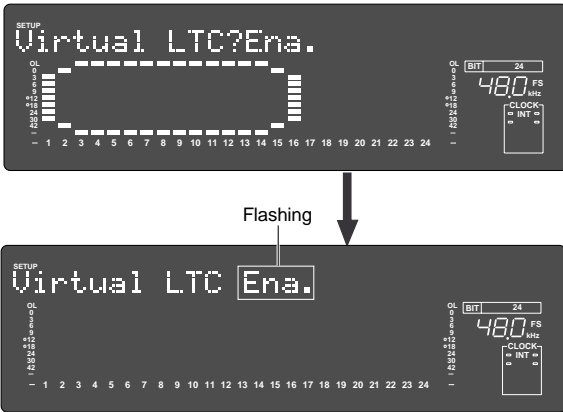
**6. Press the [EXIT/NO] key (or the [STOP] button) to exit the SETUP mode.**

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## • "Virtual LTC?" menu setting

**Execute step 1 and 2 in ""Ref. TC ?" menu setting" described earlier.**

**3. Select the "Virtual LTC?" menu by using the Jog dial and press the [EXECUTE/YES] key.**
The current setting is flashing (the default setting when the Model 8346 is installed is "**Ena.**" (enable)).



Flashing

**4. Select "Ena." or "Dis." by using the Jog dial.**

| Selection | Function |
|---|---|
| **Ena.**<br>**(Enable)** | Enables recording/playback of the virtual LTC. |
| **Dis.**<br>**(Disable)** | Disables recording/playback of the virtual LTC. This setting is used when you want to chase the recorder using only the MTC offset setting, ignoring the recorded LTC. With this setting, the TIME CODE OUT terminal outputs MTC or LTC with the MTC offset. |

**5. After selecting "Ena." or "Dis.", press the [EXECUTE/YES] key.**

**6. Press the [EXIT/NO] key (or the [STOP] button) to exit the SETUP mode.**
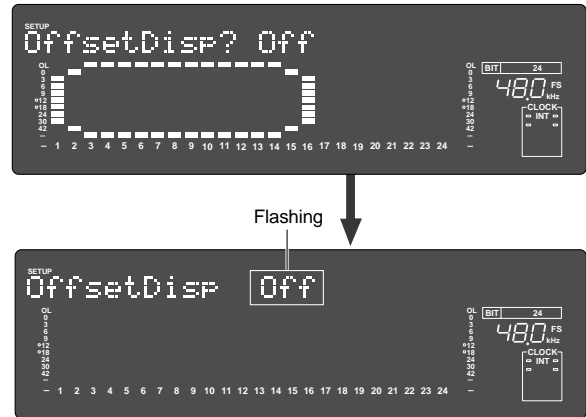
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*<CAUTION>*
*Do not set the Virtual LTC to "**Ena.**" for a disc on which data was recorded by the FDMS-3 Ver. 1.0 format using the machines such as D-160 and D108.*
*Otherwise, it may cause malfunction because the FDMS-3 Ver. 1.0 does not support the Virtual LTC.*

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## • "Offset Disp?" menu setting

**Execute step 1 and 2 in ""Ref. TC ?" menu setting" described earlier.**

**3. Select the "Offset Disp?" menu by using the Jog dial and press the [EXECUTE/YES] key.**
The current setting is flashing (the default setting when the Model 8346 is installed is "**Off**").



Flashing

**4. Select "Off" or "On" by using the Jog dial.**

| Selection | Function |
|---|---|
| **Off** | The real-offset value is not displayed. |
| **On** | The real-offset value is displayed instead of the REMAIN time when the time base is set to MTC. If you press the **[STORE]** key, the display shows "Catch Offset!" for a second, then changes to the edit mode display of the chase offset which will be explained in "GENERATOR Setup" later. After editing the chase offset, pressing the **[EXECUTE/YES]** key updates the real-offset value. |

**5. After selecting "Off" or "On", press the [EXECUTE/ YES] key.**

**6. Press the [EXIT/NO] key (or the [STOP] button) to exit the SETUP mode.**

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*<CAUTION>*
*When the power is turned off, the Offset Disp mode returns to the default setting ("Off").*
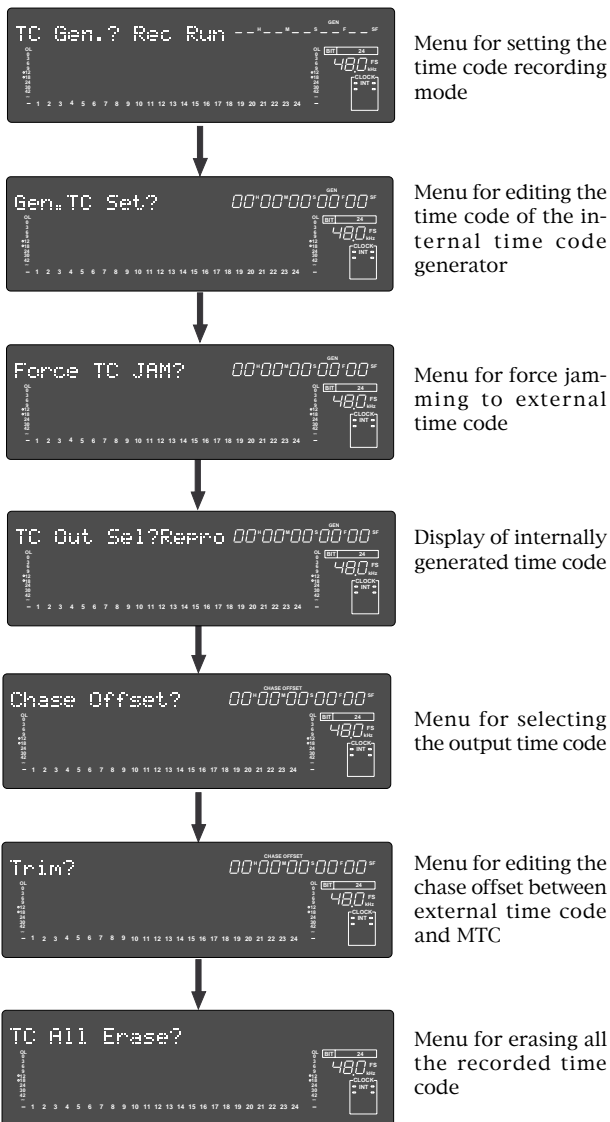
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## *Generator Setup*

By installing the Model 8346 TC/SYNC card into the recorder, the Generator Setup functions activate and the following features are available.

> **1. Recording/playback of external or internally generated time code**
> **2. Force jam to external time code**
> **3. Outputting the internally generated or recorded time code**
> **4. Setting of the chase offset between external time code and MTC**

### *How to enter the Generator Setup mode*

**1. Press the [SETUP] key while holding down the [SHIFT] key.**

The recorder enters the Generator Setup mode in which the following menus are available. The display will show "**TC Gen.?Rec Run**" (the default) when you first select the Generator Setup mode. However, from the second time, the menu selected last time will appear.

By rotating the **Jog** dial, the menus of the Generator Setup mode appear one after the other.


Menu for setting the time code recording mode


Menu for editing the time code of the internal time code generator


Menu for force jamming to external time code


Display of internally generated time code


Menu for selecting the output time code


Menu for editing the chase offset between external time code and MTC


Menu for erasing all the recorded time code

### *Setting the time code recording mode*

**1. Select "TC Gen.? Rec Run" of the Generator Setup mode and press the [EXECUTE/YES] key.**

The recording mode currently selected starts flashing, showing that you are now ready to select the desired recording mode.



Flashing
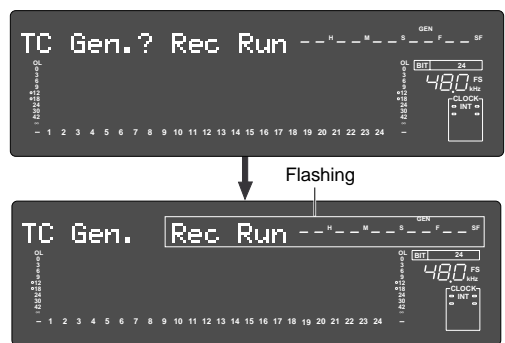


**2. Use the Jog dial to display the desired recording mode.**

You can choose from 4 recording modes available.

| Recording mode | Function |
|---|---|
| **Rec Run** | Time code that is continuous with the time code previously recorded will be recorded. This mode is also useful to re-record a discontinuous time code. |
| **Free Run** | Time code generated by the internal generator will be recorded. |
| **Ext Run** | External time code will be recorded. |
| **24H Run** | Time code generated by the internal generator will be recorded from the current time of the recorder's internal clock. |

> **<CAUTION>**
> *The 8346 does not record all time code information. It records only the ABS time at the recording start point and the time code offset value. Therefore, if you record discontinuous time code in the middle, it cannot recognize it. Also note that because the user's bit at the recording start point is maintained, the 8346 cannot recognize user's bit change in the middle.*

**3. Press the [EXECUTE/YES] key after selecting the recording mode.**

> **<CAUTION>**
> *When you create a new program using the program select function, the LTC with the same MTC offset (which you can see in the "**MTC offset?**" menu of the Setup mode) as the current program is recorded in the new program. Therefore, if you use the same LTC with the new program, you do not need to re-record LTC.*

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**<How to record time code>**
After setting the time code recording mode described above, record time code by the following procedure.

1. **Press the [EDIT] key while holding down the [SHIFT] key to turn TC READY on (the TC READY indicator will flash).**

2. **Press the [PLAY] button while holding down the [RECORD] button (the TC READY indicator will light).**

Unlike audio signal recording, you do not need to arm a track for time code.
Also note that recording time code does not consume the hard disk space.
To erase all the time code information, see "**Erasing the recorded time code**" described later.

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### Editing the internal generator time code

Editing the internal generator time code can be done only when the time code recording mode (described above) is set to "**Free Run**".

1. **Select "Gen TC Set" of the Generator Setup mode and press the [EXECUTE/YES] key.**
   The current internal generator time code is displayed and you are now ready to edit the time.
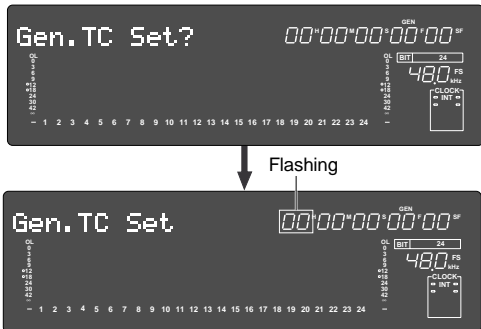


Flashing



2. **Use the Shuttle dial to move the editing point (which is flashing), and use the Jog dial to set the numeric value.**
   Up to 23H 59M 59S **F (** = current frame rate - 1) can be set.

3. **After editing is completed, press the [EXECUTE/YES] key.**

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### Force jamming to external time code

Force jamming to external time code can be done only when the time code recording mode (described above) is set to "**Free Run**". Note that the following description assumes that the 8346 is receiving external time code.

1. **Select "Force JAM" ("SURE?" flashes) of the Generator Setup mode and press the [EXECUTE/YES] key.**
   The force jamming to the external time code starts and the display shows the time code value in real-time.

Flashing
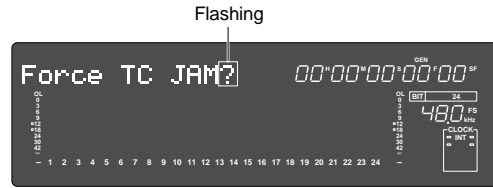


If the 8346 does not receive external time code correctly, the warning message "**Void LTC In!**" appears when pressing the [**EXECUTE/YES**] key.

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### Selecting the output time code

When the time code recording mode (described above) is set to "**Free Run**" or "**24H Run**", the 8346 can output the internal generator time code or recorded time code. Note that it does not output time code when the time code recording mode is set to "**Rec Run**" or "**Ext Run**".

**<CAUTION>**
- *While time code is output, the recorder's vari pitch and word sync functions are prohibited.*
  *Note that the time code output setting is available only when an "**Async**" mode ("**adat: Async**" or "**SPDIF: Async**") is selected in the "**D. in?**" menu of the Setup mode.*
  *Also note that if you execute a program change, etc. the generator stops time code generation.*

- *The "**TC Out Sel?**" setting returns to the default "**Repro**" when turning the power off.*

1. **Select "TC Out Sel?" ("?" flashes) of the Generator Setup mode and press the [EXECUTE/YES] key.**
   The current output setting flashes (the default setting is "**Repro**").



Flashing
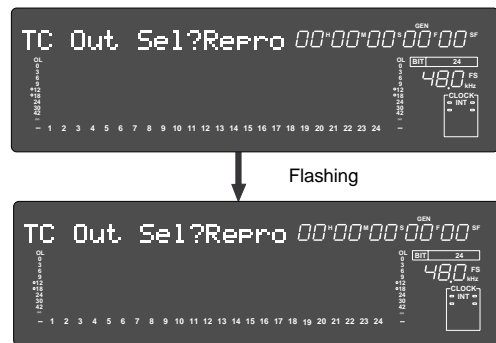


2. **Use the Jog dial to select "Repro" or "Gen.".**
   The time code output from the [**TIME CODE OUT**] terminal changes according to the setting.

| Output setting | Output time code |
|---|---|
| Repro | Reproduced time code |
| Gen. | Internal generator time code |

3. **After the setting is completed, press the [EXECUTE/YES] key.**

4. **Press the [EXIT/NO] key (or the [STOP] button) to exit the Generator Setup mode.**

## Editing the chase offset

You can edit the chase offset value between external time code and MTC (LTC) time.

### Setting the chase offset value numerically

**1. Select "Chase Offset?" ("?" flashes) of the Generator Setup mode and press the [EXECUTE/YES] key.**

You are now ready to edit the chase offset value.



Flashing



**2. Use the Shuttle dial to move the editing point (which is flashing), and use the Jog dial to set the desired value.**

The offset value can be set between "**-12H 00M 00S \*\*F 00SF**" and "**11H 59M 59S \*\*F 99SF**" (where \*\* depends on the current frame rate set by the "**Frame Rate?**" menu of the Setup mode).

**3. After editing is completed, press the [EXECUTE/YES] key.**

The edited value becomes valid and the display changes to the similar one to the upper example in step 1 above where "**?**" flashes.

### Trimming of the chase offset value

If this trimming is carried out in the chase locked state, offset can then be set in real time and is thus very effective.

**1. Select "Trim?" (where "?" flashes) of the Generator Setup mode and press the [EXECUTE/YES] key.**

The display will show something like below, and now you are ready to trim the chase offset value.



Flashing
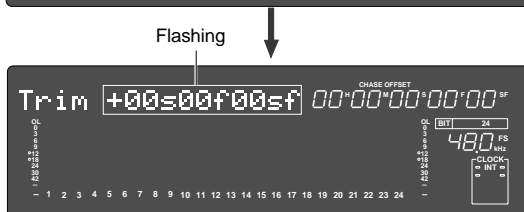


**3. Use the Jog dial to trim the chase offset value.**

By rotating the **Jog** dial, you can trim the chase offset value in real-time in sub frame accuracy.

However, if you exit the mode after the operation above (by skipping step 4), the offset returns to the original value. To make the new offset value effective, do not forget step 4 below.
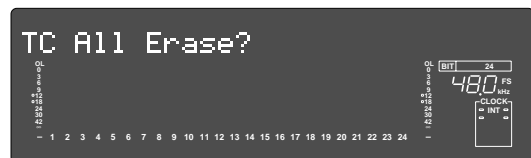
**4. Press the [EXECUTE/YES] key to confirm (set) the offset value.**

## Erasing the recorded time code

You can erase the recorded time code only while the recorder is stopped.

**1. Select "TC All Erase?" (where "?" flashes) of the Generator Setup mode and press the [EXECUTE/YES] key.**

"?" disappears and "**SURE?**" starts flashing.



Flashing



**2. Press the [EXECUTE/YES] key.**

All the recorded time code is erased and the time code set by the MTC offset will become effective (from ABS 0 to 24H).

## Chase sync to external time code

The recorder with the Model 8346 installed can synchronize to incoming LTC by receiving the external LTC via the recorder's **[TIME CODE INPUT]** terminal and setting the recorder's slave mode to On.
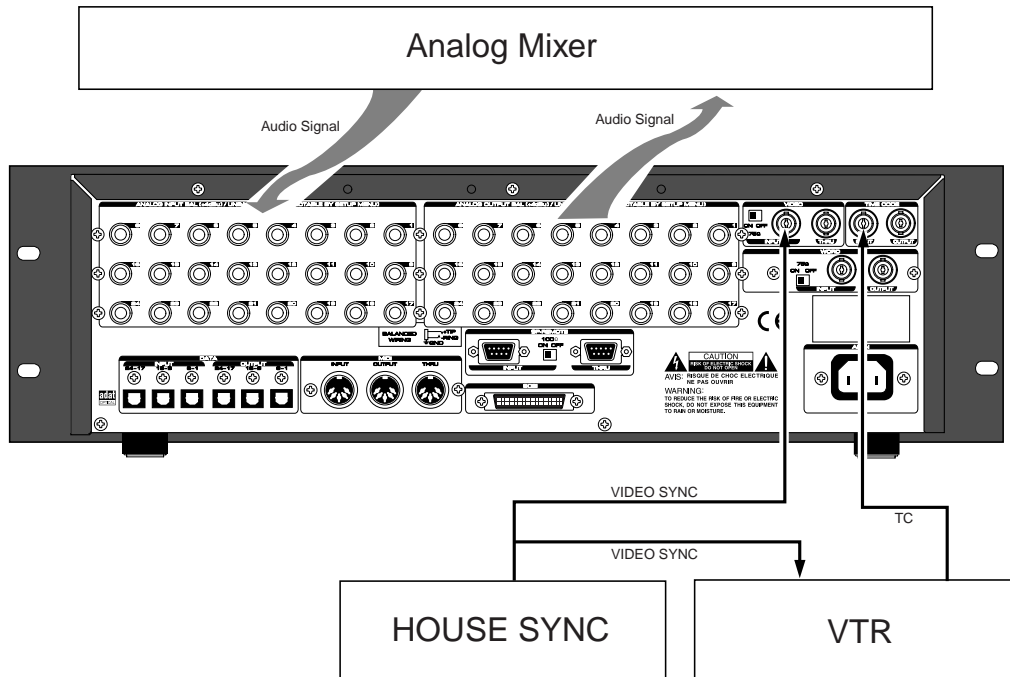


### Connection

In this example, the recorder with the 8346 is a slave while the VTR is a master. Feed the time code from the VTR to the TIME CODE INPUT terminal of the recorder with the Model 8346 to play the recorder in sync with the VTR. Also feed the video reference signal to both the VTR and recorder as shown above.

### Recorder settings

**1. Select the program to be played back.**

**2. Set the reference time code to "LTC" by using the "Ref. TC?" menu of the Setup mode.**

**3. Set the recorder's frame rate to the same rate as the incoming time code by the "Frame Rate ?" menu of the Setup mode.**
The "**Frame Rate?**" menu of the Setup mode allows you to select the desired frame rate from 24, 25, 29nd, 29df, 30nd and 30df.

**4. Set the slave mode to ON by pressing the [EXECUTE/YES] key while holding down the [SHIFT] key.**

**5. Set the desired offset value by the "MTC OFFSET?" menu of the Setup mode.**
By setting the desired offset value, the recorder will run with the offset between the VTR and recorder.

After all settings above are completed, press **[EXIT/ NO]** key (or the **[STOP]** button) to exit the Setup mode.

### Time code display

You can monitor the incoming time code in the D2424LV display window.

**1. Press the [DISP SEL] key while holding down the [SHIFT] key to select "MTC".**
The display will show the current MTC offset value (the default setting is "00H 59M 57S 00F").

**2. While "MTC" is selected, press the DISP SEL key to select the time code display.**
When the recorder is receiving LTC, the display shows the incoming LTC while "**TC IN**" lights in the display.

### Synchronization with the VTR

**1. Start playback of the VTR.**
If an offset value is set, the recorder will start playback, chasing the time code from the VTR with maintaining the offset.

*<CAUTION>*
* *The recorder can chase incoming time code within the range of continuously recorded time code. If there is a discontinuity in the recorded time code, when incoming time code runs across the discontinuous point, "**Out of Zone!**" will appear in the display and the recorder may stop chasing. If the time code corresponding to the incoming time code is recorded in a different area, play the recorder to that area.*

* *You can locate the recorder to the beginning of a discontinuous time code by pressing the **[NEXT]** or **[PREV]** key while holding down the **[SHIFT]** key.*

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## *Synchronization to word clock or video signal*

The recorder with the Model 8346 installed can synchronize to an external sync signal such as word clock and video composite signal.
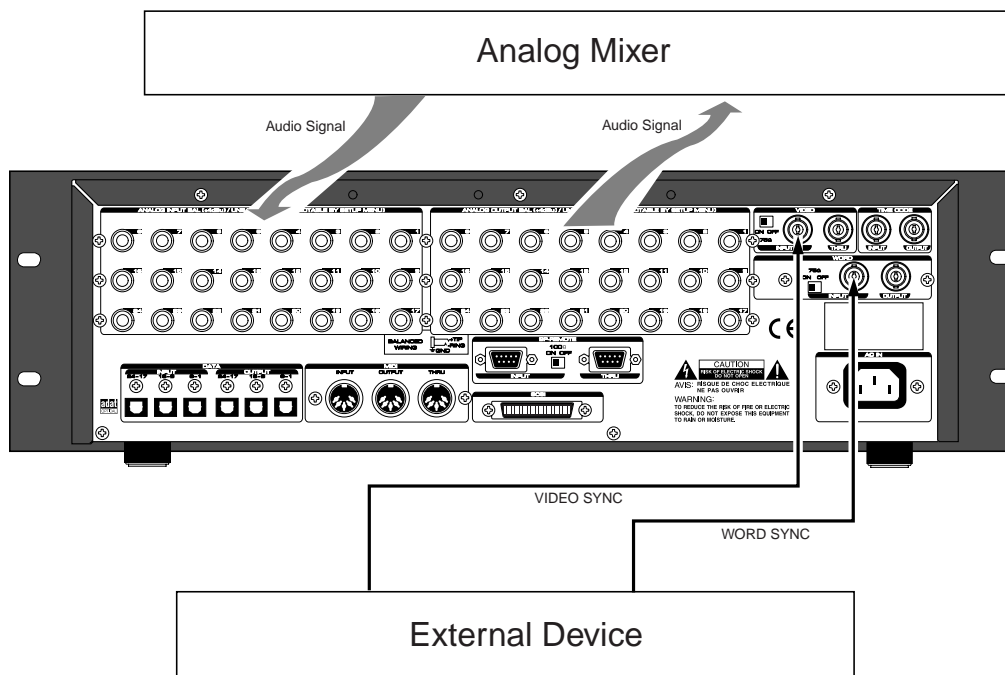


### *Connection*

In this example, according to the external device, feed video or word sync signal to the WORD INPUT or VIDEO INPUT terminal of the recorder.

### *Recorder's settings*

**1. Select the program to be played back.**

**2. Set the reference clock to "Word" or "Video" according to the incoming sync signal by using the "Clock Sel?" menu of the Setup mode.**

### *<CAUTION>*

*If you use word clock as the reference clock, the sampling frequencies of the external device and the recorder must match.*

*Because the sampling frequency of the recorder is set when formatting the disk, make sure of the sampling frequency of the external device before you start working.*

## Connection to a digital mixing console

The recorder with the Model 8346 installed can connect to a digital mixing console and record an adat digital signal from the console.

In this example, the recorder receives external LTC from a VTR, etc., locks to the time code, and returns the locking information to the digital mixing console via the digital mixer. In this process, the digital console outputs the adat digital signal to the recorder with the timing in sync with the receiving word clock. See the connection example on the next page.
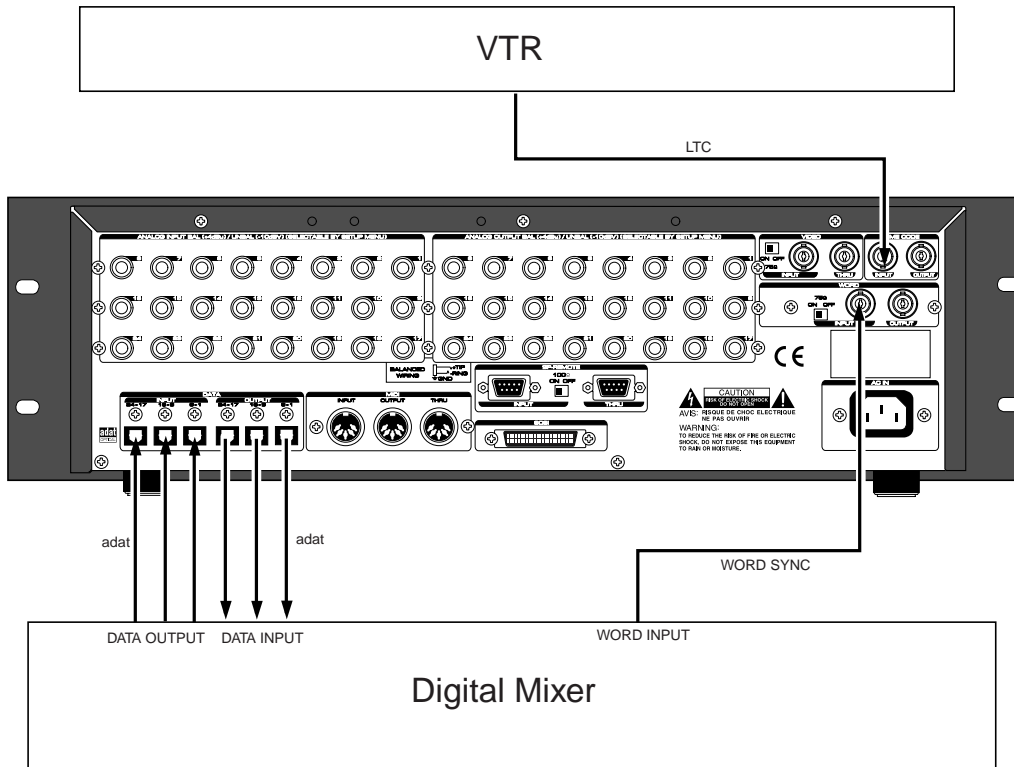


### Recorder's settings

**1. Set the preset to "Int. Vari adat" by using the "Sync Preset?" menu of the Setup mode.**
By selecting "**Int. Vari adat**", the recorder is set as follows.

> **Digital signal -> adat: Async**
> **Reference clock -> Int (internal)**
> **Slave type -> Vari**

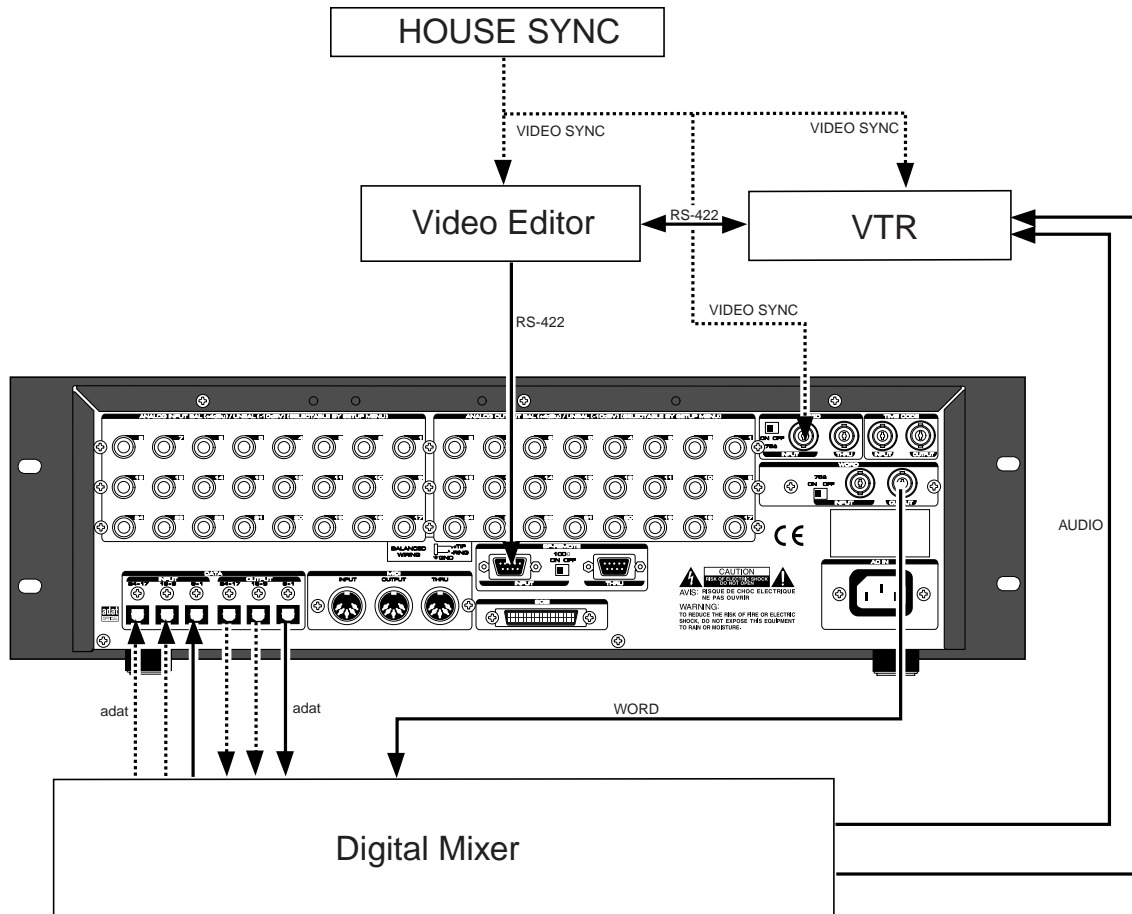**2. Set the reference time code to "LTC" by using the "Ref TC?" menu of the Setup mode.**

### Digital mixing console's settings

**1. Set the clock source of the digital mixing console to "WORD" and the input to "Adat".**

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## Control from a video editor (RS-422)

The recorder with the Model 8346 installed can be used for audio editing for video using a video editor. Connect a video editor to the recorder's REMOTE IN (RS-422) terminal, as well as connect a video sync signal to the recorder, video editor and VTR as the reference signal. With this connection example, you can edit audio for video by controlling the VTR and recorder from the video editor.



### Recorder's settings

**1. Set the preset to "Video Free adat" by using the "Sync Preset?" menu of the Setup mode.**
By selecting "**Video Free adat**", the recorder is set as follows.

> **Digital signal -> adat: Async**
> **Reference clock -> Video**
> **Slave type -> Free**

### Digital mixing console's settings

**1. Set the reference clock of the digital mixing console to "WORD".**

### <CAUTION>
*Most popular video editors can be used with the recorder/8346, however, we cannot guarantee that all video editors can be used or all functions work correctly (also note that the recorder/8346 does not support audio editors). We recommend to check whether functions work correctly or inquire to the manufacturer/dealer of an editor before using/purchasing. Also refer to the "**Basic parameter settings for editors**" below when using an editor.*

### <Basic parameter settings for editor>
*We recommend to set editor parameters as shown below when controlling the recorder. Note that these settings are just for reference and we cannot guarantee all functions work correctly with the settings.*

- *Preroll time: more than 5 seconds*
- *Edit delay: 0 frame*
- *EE delay: 0 frame*
- *Over run: 0 frame*
- *Trajectory: "Cue with Data command" is recommended*
- *Start delay: 0 frame (depending on editors)*