APPENDIX

<Operation manual for the recorder with the Model 8345 TC/SYNC card installed>

This appendix is the operation manual for the recorder with the Model 8345 TC/SYNC card installed. If you use the recorder with the Model 8345 installed, read this appendix, instead of the operation manual included in the Model 8345 package.

<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 8345.

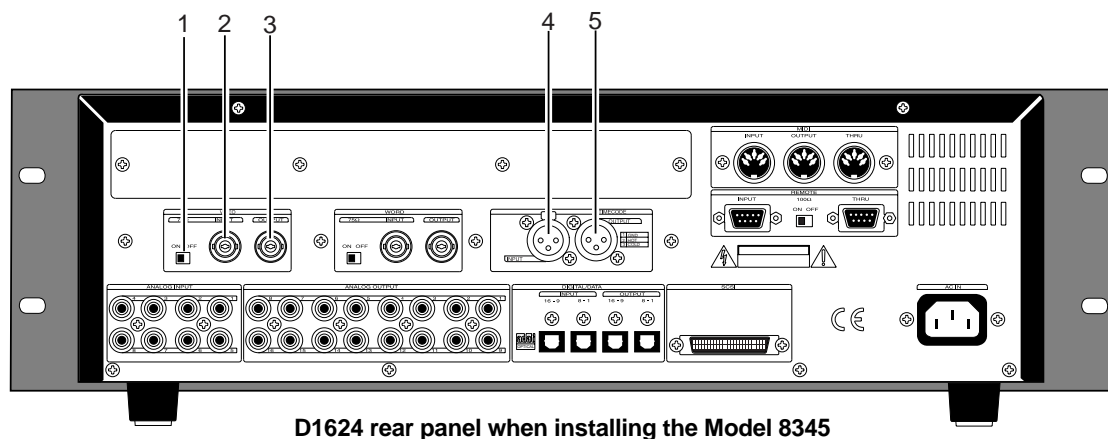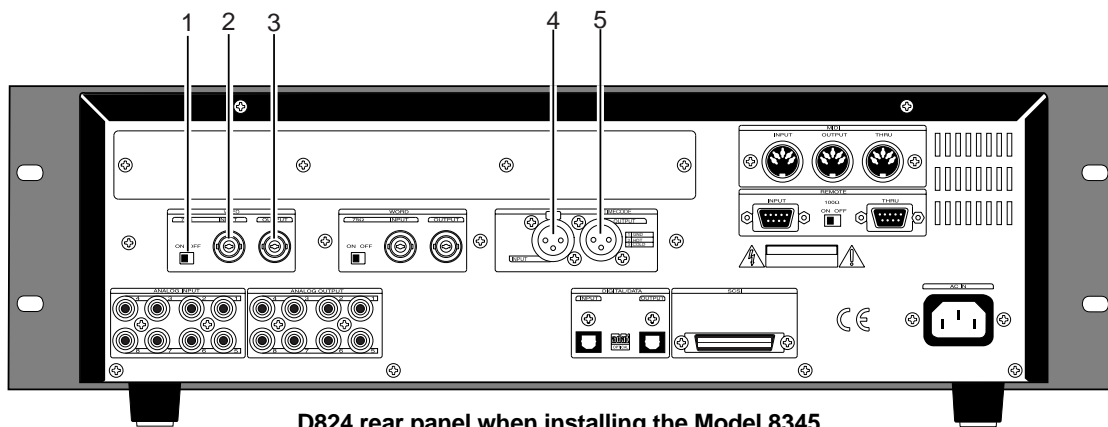### <Notes when requesting the installation>

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

D824 rear panel when installing the Model 8345

D1624 rear panel when installing the Model 8345

1. VIDEO IN termination switch
(75-ohmtermination 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
(XLR-3-31 or equivalent, balanced, pin #2 hot)
Receives external timecode (LTC).

5. TIME CODE OUTPUT connector
(XLR-3-32 or equivalent, balanced, pin #2 hot)
Outputs an LTC from the recorder (equivalent to the MTC displayed on the panel) or timecode from the internal TC generator.

3

Introduction

The Model 8345 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 8345 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 timecode used as a master timecode for the recorder.
The reference timecode can be selected between MTC (MIDI timecode) and LTC according to the incoming timecode.
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 8345.
If the 8345 is not installed, you can select the reference clock from [Int], [Auto] and [Word].
If the 8345 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 8345 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 [OffsetDisp ?] menu

This menu selects whether or not displaying the real offset between the incoming reference timecode (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) timecode, force-jamming to external timecode, setting the LTC output, and setting the chase offset value between incoming timecode 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 timecode currently selected starts flashing (the default reference timecode setting when the Model 8345 is installed is [LTC]).
The outlined box surrounds the flashing item on the display.
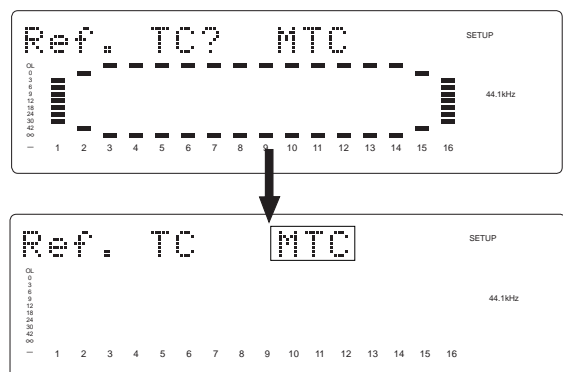
4. Select the reference timecode by using the JOG dial.
You can select between [LTC] and [MTC] (MIDI timecode).

5. After selecting the reference timecode, press the EXECUTE/YES key.
The selected reference timecode 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 timecode in the front panel display of the recorder.
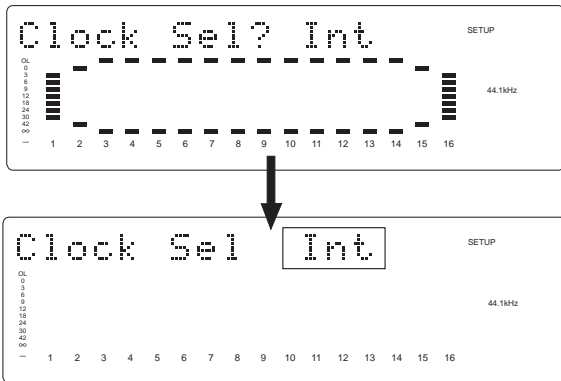See "Chase sync to external timecode" below for details.

"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 8345 is installed is [INT]).

```
Clock Sel? Int          SETUP
                                        44.1kHz
   1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16
```

↓

```
Clock Sel    Int        SETUP
                                        44.1kHz
   1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16
```

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 8345 references to the internal clock.
Word	The 8345 references to an external word clock.
Video	The 8345 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.
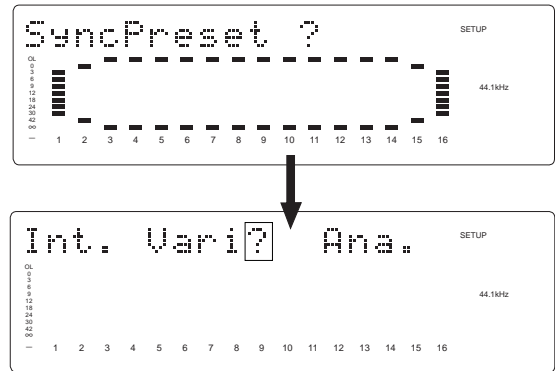
6. Press the EXIT/NO key (or the STOP button) to exit the SETUP mode.

"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 8345 is installed is [Int. Vari? Ana.]).

```
SyncPreset ?            SETUP
                                        44.1kHz
   1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16
```

↓

```
Int. Vari?  Ana.        SETUP
                                        44.1kHz
   1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16
```

4. Select the desired sync preset combination by using the JOG dial from the followings;

[Int. Vari? Ana.], [Int. Vari? adat], [Int. Free? Ana.], [Int. Free? adat], [Word Free? Ana.], [Word Free? adat], [Video Vari? Ana.], [Video Vari? adat], [Video Free? Ana.], and [Video Free? adat].

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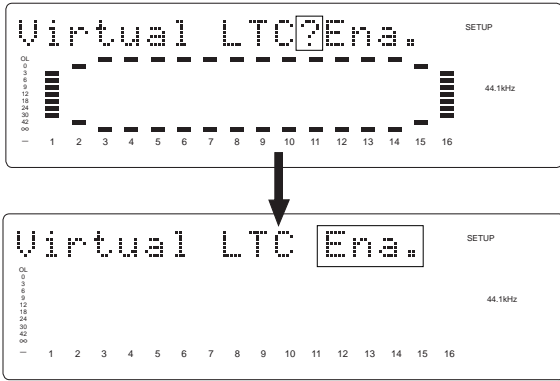
6. Press the EXIT/NO key (or the STOP button) to exit the SETUP mode.

"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 8345 is installed is [Ena.] (enable)).

4. Select [Ena.] or [Dis.] by using the JOG dial.

Selection	Function
Ena. (Enable)	Enables recording/playback of the virtual LTC.
Dis. (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.
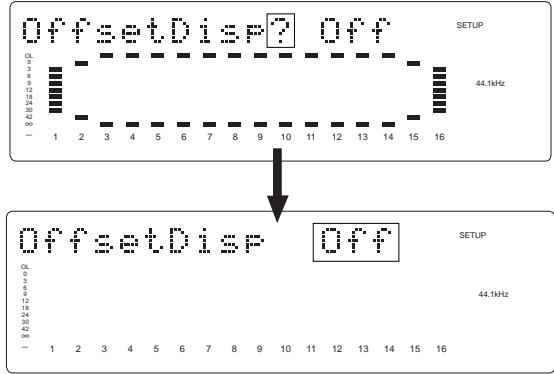
<CAUTION>
Do not set the Virtual LTC to [Ena.] for a disc on which data was recorded by the FDMS-3 Ver. 1.0 format using the machines such as D-160 and D108. Otherwise, it may cause malfunction because the FDMS-3 Ver. 1.0 does not support the Virtual LTC.

"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 8345 is installed is [Off]).

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 timebase 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.

<CAUTION>
When the power is turned off, the Offset Disp mode returns to the default setting ([Off]).

Generator Setup

By installing the Model 8345 TC/SYNC card into the recorder, the Generator Setup functions activate and the following features are available.
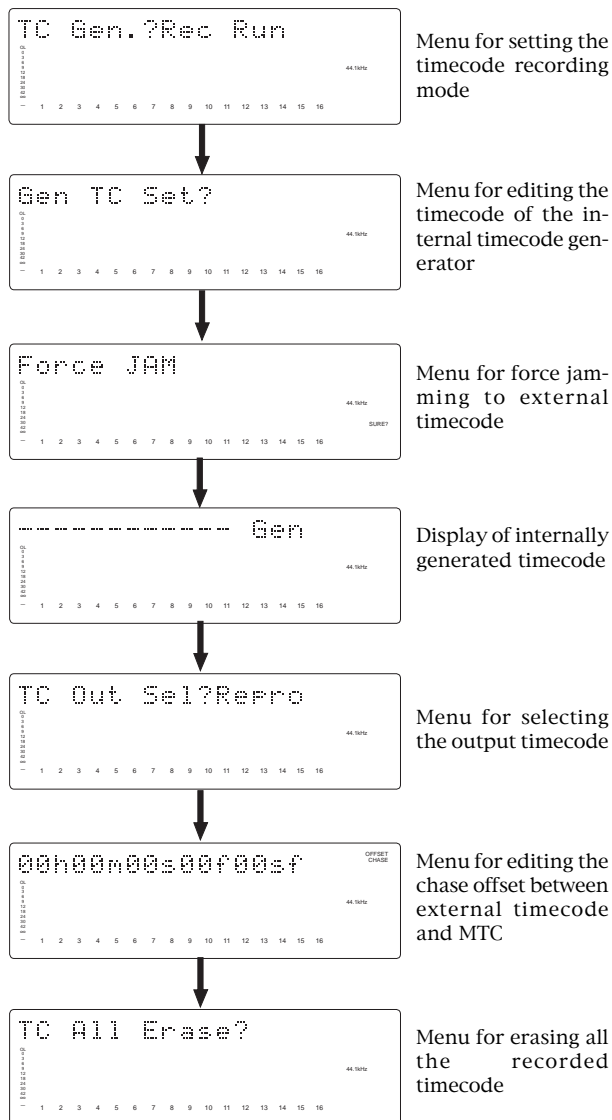
> 1. **Recording/playback of external or internally generated timecode**
> 2. **Force jam to external timecode**
> 3. **Outputting the internally generated or recorded timecode**
> 4. **Setting of the chase offset between external timecode and MTC**

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 timecode recording mode

Menu for editing the timecode of the internal timecode generator

Menu for force jamming to external timecode

Display of internally generated timecode

Menu for selecting the output timecode

Menu for editing the chase offset between external timecode and MTC

Menu for erasing all the recorded timecode

Setting the timecode 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.
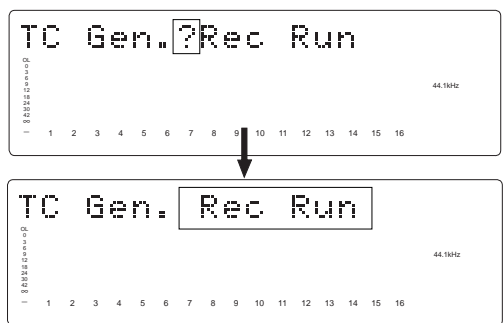
2. Use the JOG dial to display the desired recording mode.

You can choose from 4 recording modes available.

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

<CAUTION>
The 8345 does not record all timecode information. It records only the ABS time at the recording start point and the timecode offset value. Therefore, if you record discontinuous timecode in the middle, it cannot recognize it. Also note that because the user's bit at the recording start point is maintained, the 8345 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.

7

<How to record timecode>

After setting the timecode recording mode described above, record timecode 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 timecode.
Also note that recording timecode does not consume the hard disk space.
To erase all the timecode information, see "Erasing the recorded timecode" described later.

Editing the internal generator timecode

Editing the internal generator timecode can be done only when the timecode 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 timecode is displayed and you are now ready to edit the time.
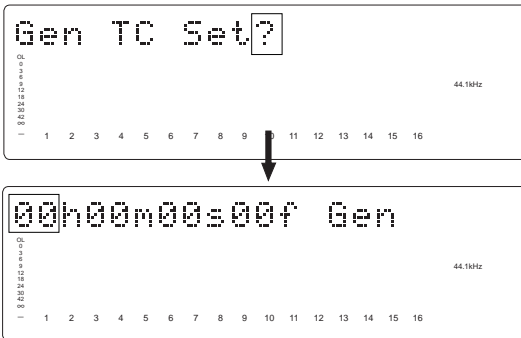
2. Use the SHUTTLE dial to move the editing point (which is flashing), and use the JOG dial to set the numeric value.
Up to 23h59m59s**f (** = current frame rate - 1) can be set.

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

Force jamming to external timecode

Force jamming to external timecode can be done only when the timecode recording mode (described above) is set to [Free Run]. Note that the following description assumes that the 8345 is receiving external timecode.

1. Select [Force JAM] ([SURE?] flashes) of the Generator Setup mode and press the EXECUTE/YES key.

The force jamming to the external timecode starts and the display shows the timecode value in real-time.

If the 8345 does not receive external timecode correctly, the warning message [Void LTC In!] appears when pressing the EXECUTE/YES key.

Selecting the output timecode

When the timecode recording mode (described above) is set to [Free Run] or [24H Run], the 8345 can output the internal generator timecode or recorded timecode.
Note that it does not output timecode when the timecode recording mode is set to [Rec Run] or [Ext Run].

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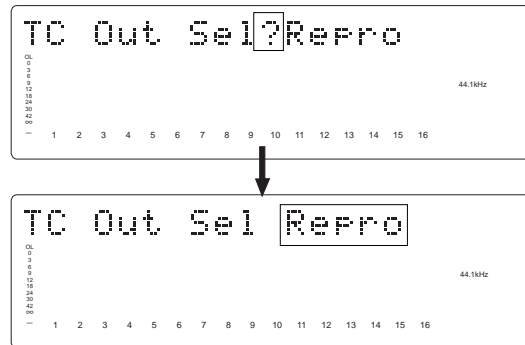 *Note that the timecode output setting is available only when an "Async" mode ([adat:Async] or [SPDIF:Async]) is selected in the [D. in?] menu of the Setup mode.*
  Also note that if you execute a program change, etc. the generator stops timecode generation.

* 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]).

2. Use the JOG dial to select [Repro] or [Gen.].
The timecode output from the TIME CODE OUT terminal changes according to the setting.

Output setting	Output timecode
Repro	Reproduced timecode
Gen.	Internal generator timecode

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

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

8

Editing the chase offset

You can edit the chase offset value between external timecode and MTC time. In addition to the numerical offset entry, you can also trim the chase offset value "on the fly" in subframe accuracy when the D824/D1624 is set to the "slave mode" (by pressing the EXECUTE/YES key while holding down the SHIFT key) and being chase-locked to the incoming external timecode ([CHASE] lights on the display). The following operation assumes that external timecode is available. Note that the manual editing of the chase offset value is possible only while the recorder is stopped.

Setting the chase offset value numerically

1. Select [OFFSET CHASE] ([OFFSET CHASE] flashes) of the Generator Setup mode and press the EXECUTE/YES key.

You are now ready to edit the chase offset value ("00" of "00h" and [SURE?] flash).
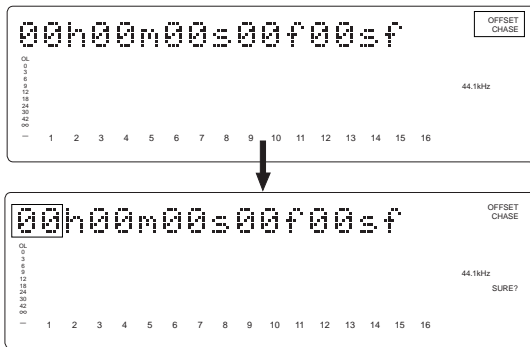
2. Use the SHUTTLE dial to move the editing point (which is flashing), and use the JOG dial to set the desired value.

The offset value can be set between [-9h59m59s**f99sf] and [14h00m00s00f00sf] (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 [OFFSET CHASE] flashes.

"On the fly" trimming of the chase offset value

You can trim the chase offset value "on the fly" only when the D824/D1624 is set to the "slave mode" (by pressing the EXECUTE/YES key while holding down the SHIFT key) and chase-locked to the incoming external timecode ([CHASE] lights on the display).
The following operation assumes that the D824 or D1624 is being chase-locked to the external timecode.

1. Select [OFFSET CHASE] ([OFFSET CHASE] flashes) of the Generator Setup mode.

When the recorder is locked to the master and reproducing audio, the display will show as below.

2. Press the EXECUTE/YES key while the above display ([Trim] with flashing [?]) is shown.

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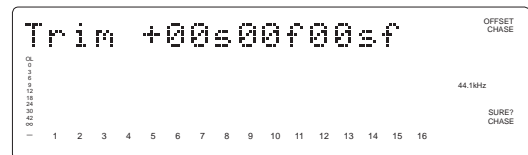
3. Use the JOG dial to trim the chase offset value.

By rotating the JOG dial, you can trim the chase offset value in real-time in subframe 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.
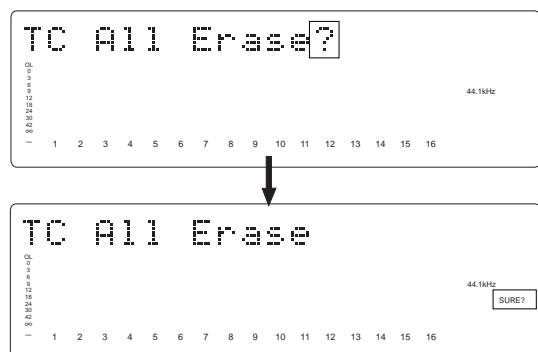
4. Press the EXECUTE/YES key to confirm (set) the offset value.

Erasing the recorded timecode

You can erase the recorded timecode 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.

2. Press the EXECUTE/YES key.

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

Chase sync to external timecode

The recorder with the Model 8345 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.
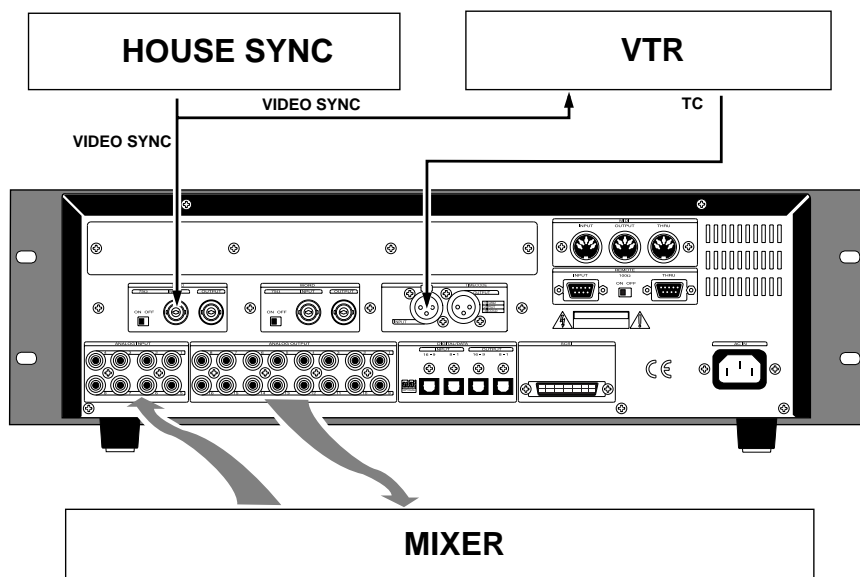
Connection

In this example, the recorder with the 8345 is a slave while the VTR is a master. Feed the timecode from the VTR to the TIME CODE INPUT terminal of the recorder with the Model 8345 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 timecode 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 timecode 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 OFF SET?] 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.

Timecode display

You can monitor the incoming timecode in the D824/D1624 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 "00h59m57s00f").

2. While [MTC] is selected, press the DISP SEL key to select the timecode 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 timecode from the VTR with maintaining the offset.

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

• You can locate the recorder to the beginning of a discontinuous timecode by pressing the NEXT or PREV key while holding down the SHIFT key.

Synchronization to word clock or video signal

The recorder with the Model 8345 installed can synchronize to an external sync signal such as word clock and video composite signal.
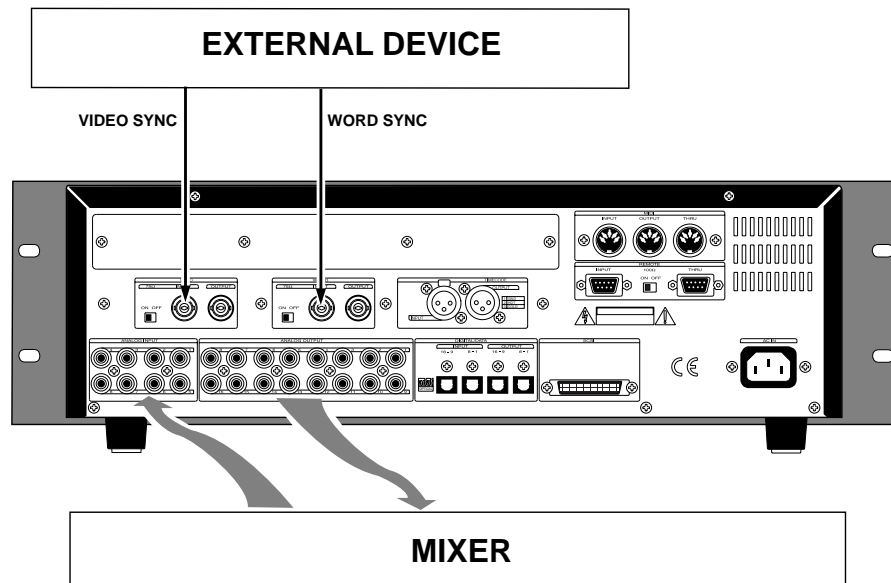
Connection

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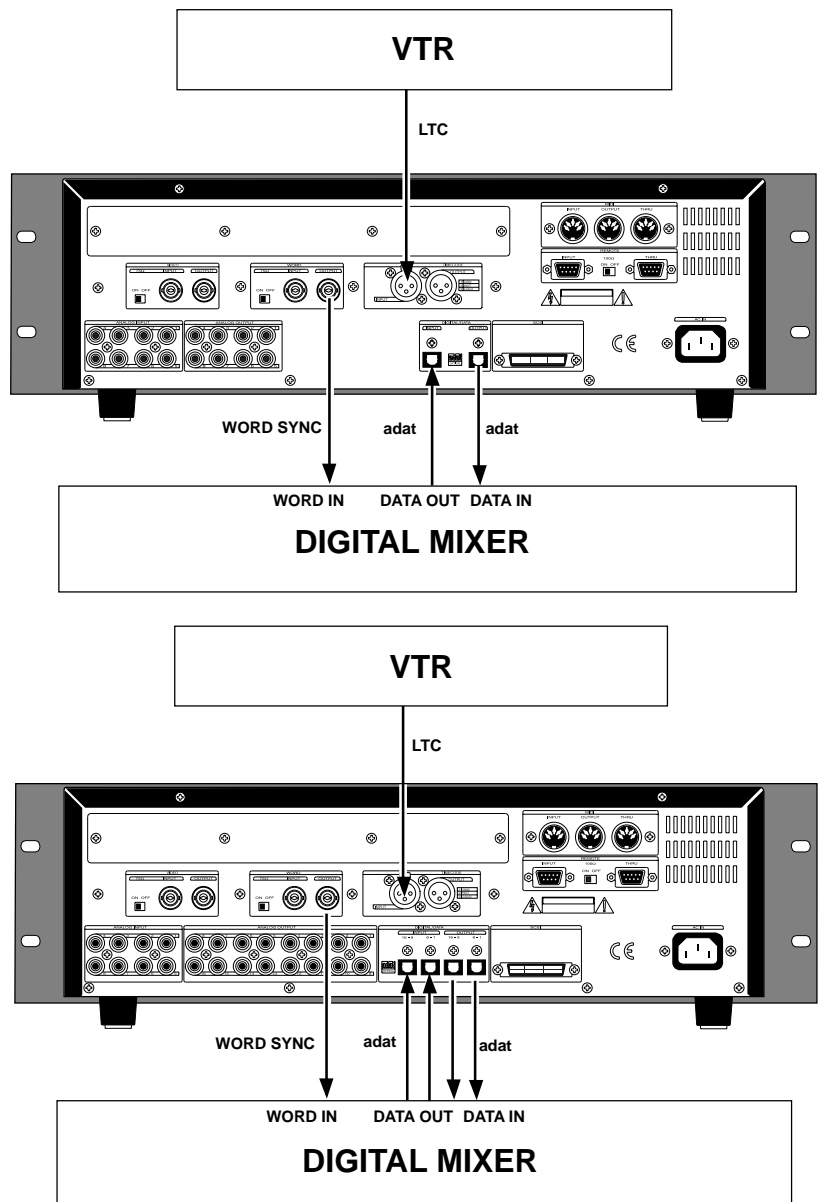*Because the sampling frequency of the recorder is set when formatting the disk, make sure of the sampling frequency of the external device before you start working.*

Connection to a digital mixing console

The recorder with the Model 8345 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 timecode, 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.

VTR

LTC

WORD SYNC   adat   adat

WORD IN   DATA OUT DATA IN

DIGITAL MIXER

VTR

LTC

WORD SYNC   adat   adat

WORD IN   DATA OUT DATA IN

DIGITAL MIXER

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 timecode 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].

12

Control from a video editor (RS-422)

The recorder with the Model 8345 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.
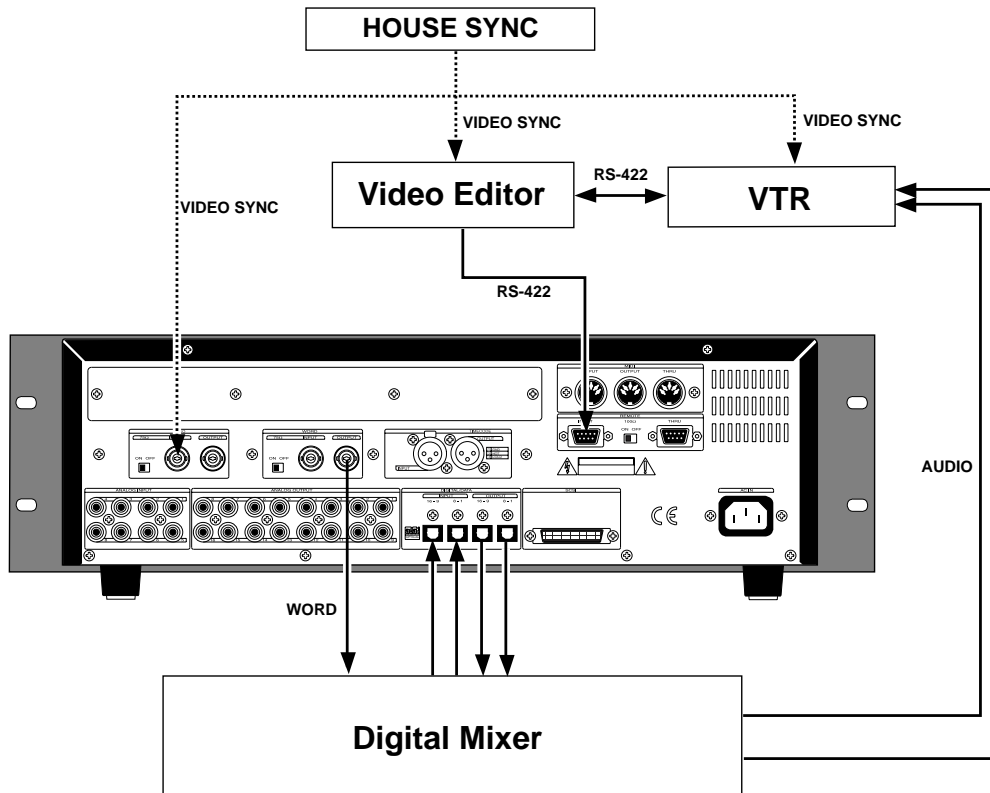
Recorder's settings

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/8345, however, we cannot guarantee that all video editors can be used or all functions work correctly (also note that the recorder/8345 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)

13

Memo