FOSTEX

TC/RS-422 Interface Card for D-10

Model 8333 (V2.2*)

Owner's Manual

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Thank you for purchasing the Fostex Model 8333 Interface Card. The 8333 is a TC/RS-422 interface card developed as an exclusive option for the D-10 Digital Master Recorder.

By installing this interface card, the D-10's features can be further extended with additional functions. External time code (LTC) can be converted to IEC time code (Pro R time and Pro binary) recorded and used for controlling via RS-422.

This interface card is provided with connectors for TC in/out (XLR) and remote control D-sub 9 pin (RS-422 REMOTE/THRU), an optional exclusive ROM and, in addition, a ROM (*) for the D-10 main unit.

In this manual, new functions and changes in operation of the D-10 when installing the 8333 will be explained. Please read this together with the D-10 manual.

Data on the ES-Bus and SONY 9 pin protocol are also contained for your reference.

(*) ROM for the D-10 main unit

> When the 8333 is installed, the D-10 main unit must be updated.
>
> Consequently, it is necessary to replace the original ROM provided in the D-10 with that in the 8333.

1. Contents of Package

Accessory items packaged with the 8333 are as listed below.

Please check contents with this list for any missing items. If anything is missing, please contact the Fostex Dealer or Distributor.

	Accessory	Amount
①	Option card	1
②	Option exclusive EP-ROM (installed on card)	1
③	Replacement ROM for D-10 main unit	1
④	Rear panel	1
⑤	Shield	1
⑥	Reinforcement bracket	2
⑦	Assortment of mounting screws	12
⑧	Connecting cables	3
⑨	Owner's Manual	1

* Refer to illustration in next page.

2. Installing the Card in the D-10

Normally, Fostex Dealer or Distributor will install this card in the D-10.

Therefore, please request the dealer or distributor of purchase to do the installation.

③ Replacement ROM for D-10 main unit

⑥ Reinfocement Bracket

① Option Card (② Installed exclusive ROM)

⑤ Shield

⑥ Reinfocement Bracket

④ Rear Panel

4 pin-white
(to power supply PCB)

FPC-25 (to main PCB)

⑧ Connecting Cables

3 pin-white (to main PCB)

⑦ Assortment of Mounting Screws

⑨ Owner's Manual
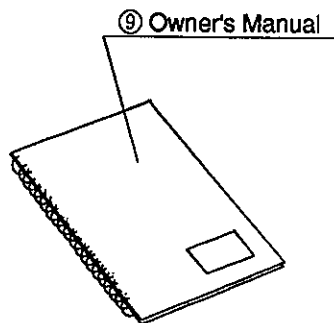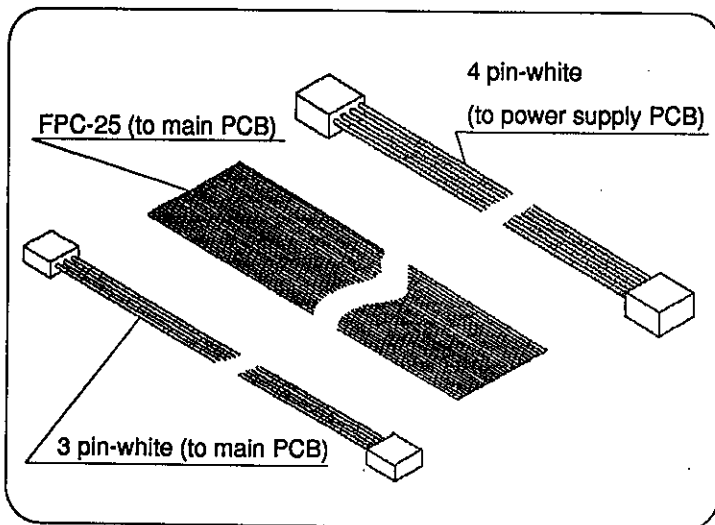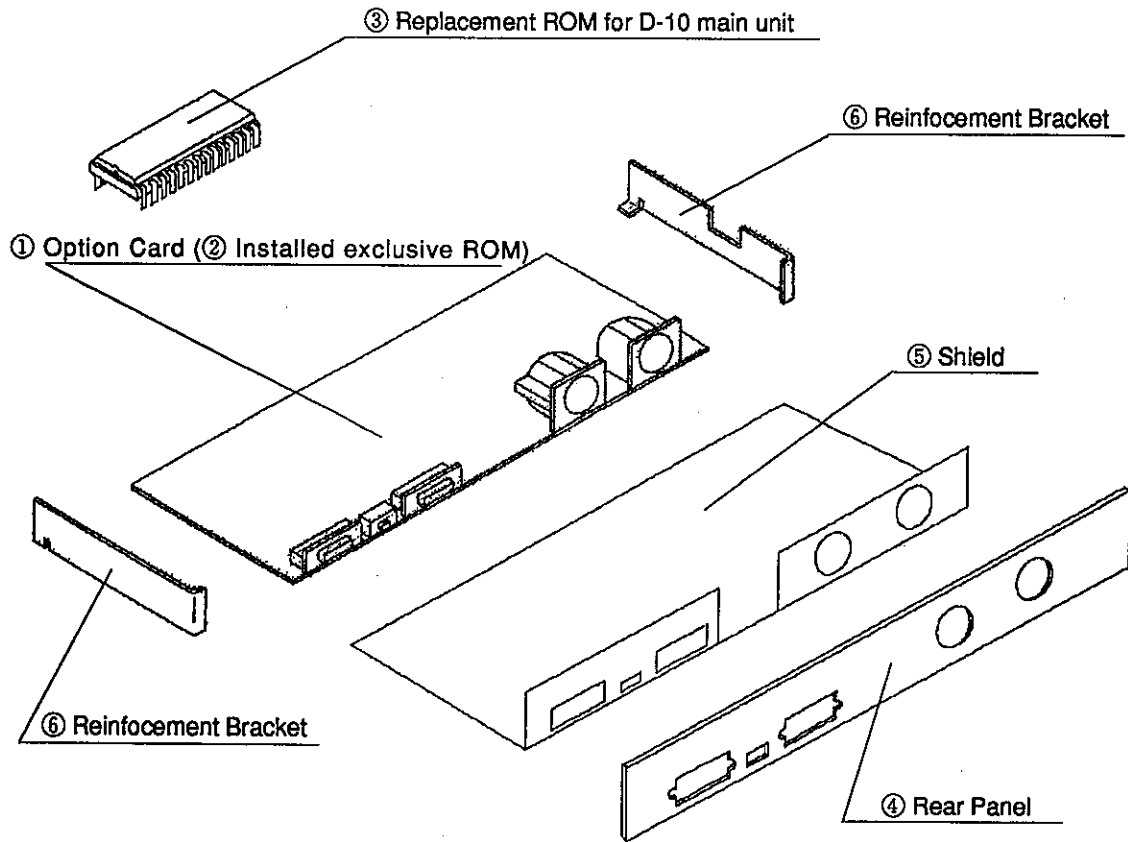
	φ 2.6mm, L=6mm X2 (nickel-plate)
	φ 2.6mm, L=6mm X6 (black)
	Fix-stand D-sub, 4.8mm X4 (nickel-plate)

3. Outstanding Features and Basic Functions

3-1. External time code (LTC) sent to the time code input can be converted to IEC Time Code (composed of Pro R-Time and Pro Binary) the standard format for professional DAT time code recording, and recorded on tape.

<NOTE>

Time code (LTC) can be recorded only during recording of audio signals (or no sound recording) and time code cannot be independently recorded.

3-2. If Pro R-Time or A-Time is recorded on the tape, they can be converted to time codes (LTC) and output from the time code output connector.

<NOTE>

Because there is no Video Sync input in the D-10, there is a slight clock deviation between the recorded time code (LTC) and the internal sampling clock. If a tape recorded by the D-10 is chase locked in equipment with video sync capabilities such as a D-30 and played back after locking, the OFFSET figure often deviates slightly. This can be solved by using the "Frame Sync playback mode" of the D-30.

3-3. Contains two RS-422 connectors (D-sub 9 pin) for REMOTE and THRU which allows control of multiple the D-10 in daisy chain connection of the ES-Bus or controlling of computers/editors (NOTE).
The protocol complies to the SONY 9 pin protocol or ES-Bus either of which can be selected. Selecting can be done via the SET UP mode which is newly added with installation of the 8333 card. However, escape mode only of the ES-Bus machine message will be executed and non-standard messages used here should be equivalent to the SONY 9 pin protocol.

<NOTES>

* Because a vari pitch function is not provided in the D-10 main unit, a vari-speed command from the video editor will be ignored.

* Because there is no video sync input in the D-10, if a house sync system is used for phase modifying all machines in the system with the video reference, in some cases time code phase will deviate from other equipment. For example, when sound editing using a video editor and the D-10, a one frame difference could occur at the sound editing point.

There are also messages not followed up in the 8333 protocol. For details on this, refer to "ES-Bus/SONY 9 pin protocol" at the end of this manual.

For contents of the added SET UP mode, refer to "5-2. Changes/Additions in the SET UP mode" of this manual.

For details on the ES-Bus and SONY 9 pin protocol, please refer to "ES-Bus/SONY 9 pin protocol" at the end of this manual.

> *IN THIS MANUAL, THE COMBINATION OF "PRO R-TIME" AND "A-TIME" WILL BE REFERRED TO AS "DAT TIME."*

4. Names and Functions of the Controls and Connectors
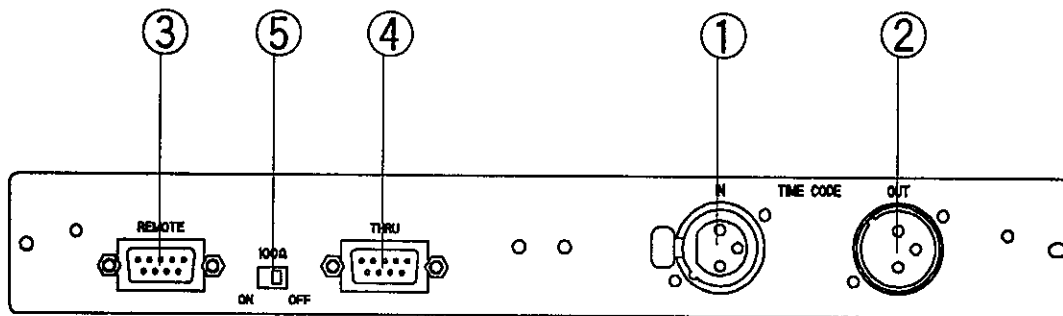
① TIME CODE IN connector (balanced)

Time code (LTC) from an external source is input here.

Connector: Type XLR-3-31 (#2 pin hot)

② TIME CODE OUT connector (balanced)

Time code (LTC) on the tape is output here.

Connector: Type XLR-3-32 (#2 pin hot)

③ RS-422 REMOTE connector

Remote control connector complying to the RS-422 specs.

Connector: D-sub 9 pin

④ RS-422 THRU connector

Signal input to the REMOTE connector is output here.

When multiple numbers of the D-10 are connected for control by the ES-Bus, this is daisy chained to the other D-10 remote connectors.

Connector: D-sub 9 pin

⑤ Terminating switch

RS-422 signal termination ON/OFF switch and is normally set to ON.

When daisy chain connecting at the ES-Bus, the last equipment only must be switched ON and all others switched OFF.

5. Functional Changes and Additional Functions in the D-10 Main Unit

Some of the D-10 functions will change or be modified by installation of the 8333. The following explains functional changes and additions acquired by installation.

5-1. Content of changes

5-1-1. R-Time in the FL display has been changed to time code (TC).

5-1-2. External time code (LTC) input will be indicated as the Reference (REF TC).

The D-10 main unit DISP TIME functions will be as follows:

[Indications without the 8333]

```
┌→( A-Time )───→( R-Time )───→( DATE )───→( COUNT )─┐
│                                                    │
└────────────────────────────────────────────────────┘
```

[Indications with the 8333 installed]

```
┌→( A-Time )───→( TC (*1) or A-Time TC (*2) )───→( DATE )─┐
│                                                          │
└──( REF TC (*3) )◄───────────( COUNT )◄──────────────────┘
```
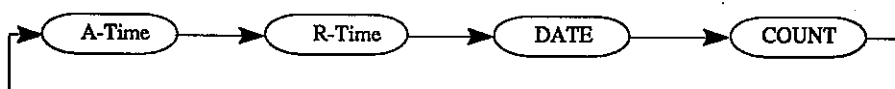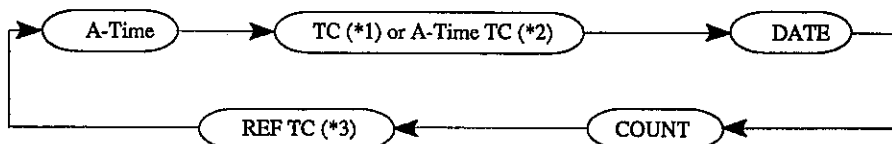
(*1) TC	:When PRO R-Time is converted to time code (When DAT TIME to be converted is selected for "IEC AUTO" or "IEC MANUAL").
(*2) A-Time TC	:When A-Time is converted to time code (When DAT TIME is selected for "A-Time TC").
(*3) REF TC	:The input time code (REF TC) is indicated as shown below.

Example:

When (1 hour, 40 minutes, 23 seconds, 11 frames, Frame rate=24)

01ʜ 40ᴍ 23ꜱ 11ꜰ --- 24

Frame rate will be indicated as follows:

TC types	Indications
24 (FILM)	24
25 (EBU)	25
30 or 29.97 Drop Frame (SMPTE)	DF
30 or 29.97 Nondrop Frame (SMPTE)	ND

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5-1-3. TIME indication when memory editing and RAM SCRUB/RAM REPEAT operation changed to 1/100 Frame.

For details on the memory edit mode, please refer to the D-10 owner's manual. In a D-10 without the sync card installed, A-Time and R-Time units smaller than one frame were indicated in msec when in the memory edit mode and during RAM SCRUB/RAM REPEAT operations.

With the 8333 installed and the D-10 in the memory edit mode, "msec" will change to "1/100 frame". When editing the 1/100 Frame of memory data, the display will not be blinking "MS" (msec) but "-" (right end of the sub frame display). Please refer to the schematic below.

Display example at memory editing

[Without the 8333]

12H **23**M **11**S **32**F **25**MS
Hour   Minute   Second   Frame   msec.

[With the 8333 installed]

12H **23**M **11**S **32**F **95-**
Hour   Minute   Second   Frame   Sub-frame

5-1-4. Saving PRO R-time Data

When the sub code of tape recorded with PRO R-Time is edited in the unmodified D-10, that PRO R-Time was erased. When the 8333 is installed, this will not be erased but remain intact.

<NOTE>

However, PRO R-Time or time code not in sync with the audio sample cannot be guaranteed.

5-1-5. Audio/Time Code Inputs can be Monitored.

Input of audio and time codes can be monitored by pressing the D-10 input monitor key when the transport is in pause or stop. In all other modes, the input monitor key will function only for time code and will be in repro monitor for audio signals.

<NOTE>

During playback, even if the input monitor key is pressed and time code output is set to input monitor, the D-10 time code display will remain in repro. Therefore, if the length of the time code being input must be confirmed, set the display to REF by pressing the DISP TIME key, so that the time code figure being input can be confirmed.

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5-2. Additional SET UP mode functions

There will be changes and new additions to the SET UP mode by installing the 8333 in the D-10.

1. vE rS io n   001 -chk (change in function)
2. Pr Ot oc ol   301 -xxx (additional function)
3. Ma ch n Ad   302 -xxx (additional function)
4. rE Pr tc   401 -xxx (additional function)
5. Fr Am e   402 -xxx (additional function)
6. PA US tc   403 -xxx (additional function)
7. wi Nd tc   404 -xxx (additional function)

<NOTE>

Although the contents of the SET UP mode will be backed up, please note that it will return to the setting at leaving the factory should it be reset by "SET UP mode [801] : user memory ALL reset".

5-2-1. vE rS io n   001 -chk

Version number of the 8333 can be checked in addition to that for the D-10.
Version numbers of the D-10 and 8333 are alternately displayed by manipulating the JOG dial.

d- 10   :v2 -00 (Version of D-10)
   IF   :v2 -00 (Version of 8333)

* If a 8333 interface card is not installed, its version number will be displayed as [--- ---].

5-2-2. Pr Ot oc ol   301 -xxx

Selects the RS-422 communication protocol.
Either the SONY 9 pin protocol or the ES-Bus protocol can be selected. The desired protocol is selected by the JOG dial and fixed by pressing the EXECUTE key.

So ny 9p   301 -000(*)   :Sony Protocol
ES b us   301 -001   :ES-Bus Protocol

¨5-2-3. Ma ch n Ad   302 -xxx

Machine Address for control by the ES-Bus is set.
For details on the Machine Address, refer to the "SONY 9 pin protocol/ES-Bus protocol".

Ma ch n Ad   302-000 ～ 063

5-2-4. rE Pr tc   401 -xxx

The original DAT TIME to be converted to time code is selected. The desired item is selected by the JOG dial and set by pressing the EXECUTE key. DAT TIME is selected from the following three types:

IE C AU to	401 -000 (*)	:Will be converted to time code from PRO R-Time (Frame rate will be "Auto").
IE C MA NU	401 -000	:Will be converted to time code from PRO R-Time (Frame rate must be set by "402 -xxx" in next page).
A-Time TC	401 -002	:Will be converted to time code from A-Time (Frame rate must be set by "402 -xxx" in next page).

<NOTE>

When 401 -000 "IEC AUTO" is selected, it will be automatically output at the frame rate used at recording regardless to frame rate set in item 5-2-5.

5-2-5. Fr Am e   402 -xxx

When converting PRO R-Time or A-Time to time code by setting the original DAT TIME to be converted to [401-001] or [401 -002], the frame rate of the time code to be converted can be set at the desired value. Frame rate must be selected from the following six types.

If DAT TIME is set to [401 -000] this setting will become invalid and automatically output at the same frame rate as at recording.

The desired frame rate is selected by the JOG dial and set by pressing the EXECUTE key.

Fr24	402 -000	: 24 Frame
Fr25	402 -001(*)	: 25 Frame
Fr29 97df	402 -002	: 29.97 Drop Frame
Fr29 97	402 -003	: 29.97 Nondrop Frame
Fr30	402 -004	: 30 Frame
Fr30 df	402 -005	: 30 Drop Frame

* Although frame rate default is 25 Frame, it can be changed to 29.97 Drop Frame.

<IMPORTANT NOTE>

When a 30 frame LTC (ND and DF) is input, this equipment will internally, forcibly acknowledge and record it as a 29.97 frame LTC.

However, when "IEC AUTO" is selected by [401 -xxx], no problem will occur as it is designed to automatically correct this discrepancy and output it in 30 frames.

On the other hand, when "IEC MANUAL" is selected and furthermore, set to "Fr 30" or "Fr 30 dF" by [402 -xxx], this will result in double correction and as a result, a

time code difference in address from that at recording will be output (there will be a difference between the sound and the time code address).

To avoid this, when a tape recorded with a 30 frame time code is to be played back with the D-10 or other DAT recorder, be sure to set the playback time code frame rate to "29.97". If the D-10 is to be used, set [402 -xxx] to either "Fr 29.97 df" or "Fr 29.97".

\<NOTE\>

If default is set to 29.97 Drop Frame when installing the 8333, it must be noted that the above default indication will also be 29.97 Drop Frame. For method of changing the default figure, consult your nearest Fostex Dealer or Service Center.

5-2-6. PA US tc   403 -xxx

Selects whether time code output is to be output or not in the pause mode.
The desired item is selected via the JOG dial and set by pressing the EXECUTE key.

OFF	403 -000(*)	: Pause TC off
ON	403 -001	: Pause TC on (Time code that is read is repeatedly output in one unit consisting of hour, minute, second and frame.)

5-2-7. wi Nd tc   404 -xxx

Time code output type at F FWD/REWIND is selected. Desired output type is selected by the JOG dial and set by pressing the EXECUTE key. Output type can be selected from the following three:

1 Fr Am	404 -000(*)	:Time code that is read is output in one unit consisting of an hour, minute, second and frame.
5 Fr Am	404 -001	:In addition to the time code that is read consisting of one unit of hour, minute, second and frame, four more frames are artificially attached, converted into a continuous time code in the positive direction for 5 frames, then output.
St oP	404 -002	:Time code will not be output in other than the Play and Rec modes.

5-2-8. rE F P ly   405 -xxx

Selects whether event start is allowed or not by the time code which is input.

The desired item is selected by the JOG dial and set by pressing the EXECUTE key.

oFF   405 -000(*) :Not functional.

oncE   405 -001   :Event start is executed only once, enters the "oFF"
                            mode simultaneous with execution, and cease to
                            function upon completion of event start.

EvEry   405 -002   :Event start can be executed st any time.

While the D-10 is in the PAUSE or STOP mode, it can be event started by the reference time code which enters the D-10 in the play mode, when the positive direction time code figure input to the TIME CODE IN connector equals the time set in MEMORY 0 or when this time is exceeded.

In this case, if GPI is "ON", the EVENT 0 signal will be output from GPI OUT.

<NOTE>

If time code other than in the positive direction is input, event start will not be executed.

When the event start execution mode is set to "oncE" or "EvEry", [REF] in the display will blink.

This mode will be automatically "oFF" when power is switched off to prevent malffunction.

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6. Recording of External Time Code (LTC)

By installing the 8333, externally input time code (LTC) can be converted to IEC TIME CODE (PRO R-Time and PRO Binary) and recorded in the sub code area while recording an audio signal (or no sound recording) at the same time.

<NOTE>

This equipment cannot separately record audio and time codes. Therefore, please note that if audio is inserted in the no sound recording section, the time code of that section will be erased.

6-1. Connections

In order to record time code (LTC) together with the audio signal (or no sound), the equipment must be connected as shown in the schematic below.

1. Connect the external time code (LTC) output to the TIME CODE IN connector of the D-10 equipped with the 8333.

2. Connect the audio input to the D-10 DIGITAL IN connector (or ANALOG IN).
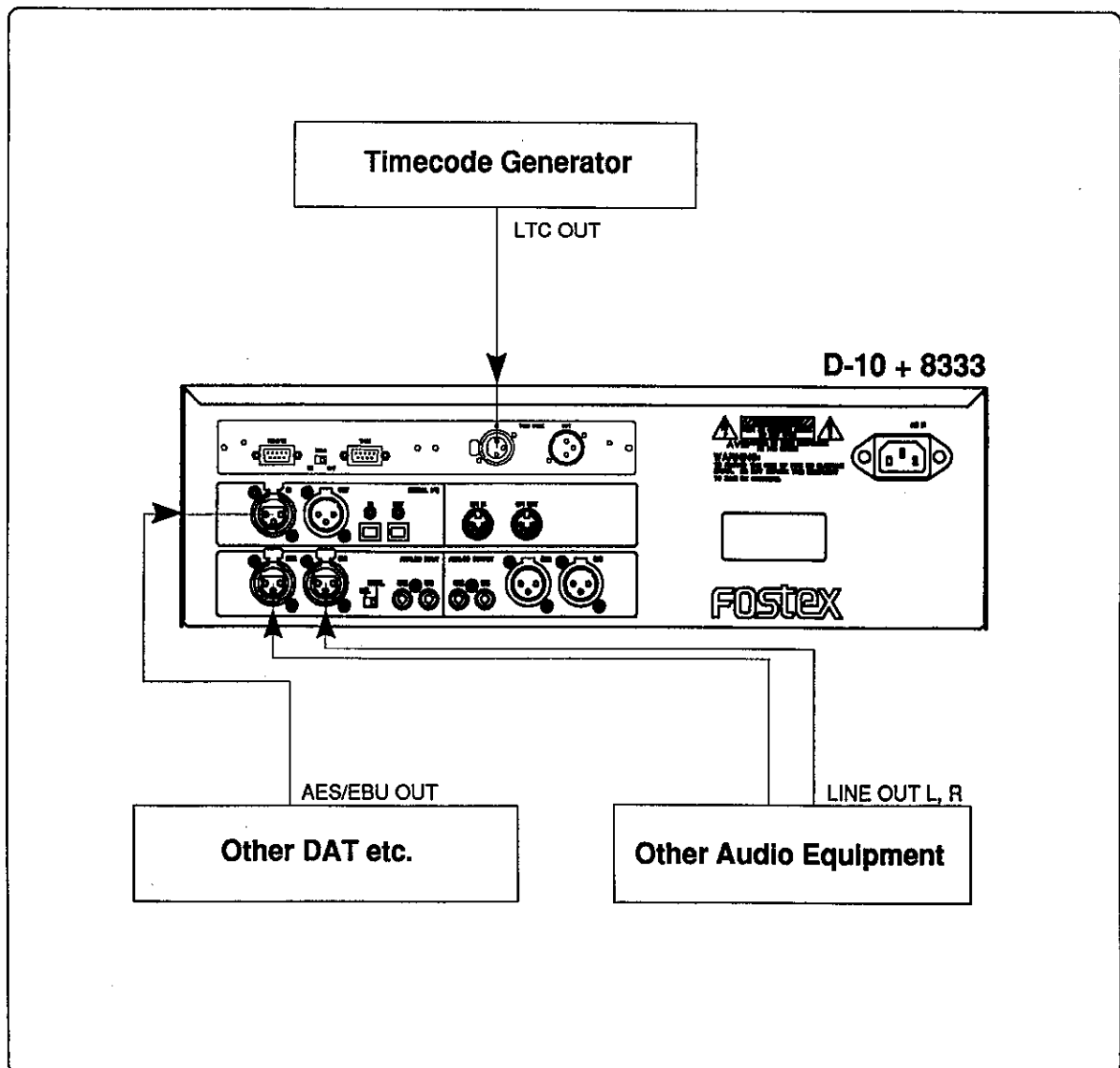
6-2. Operation
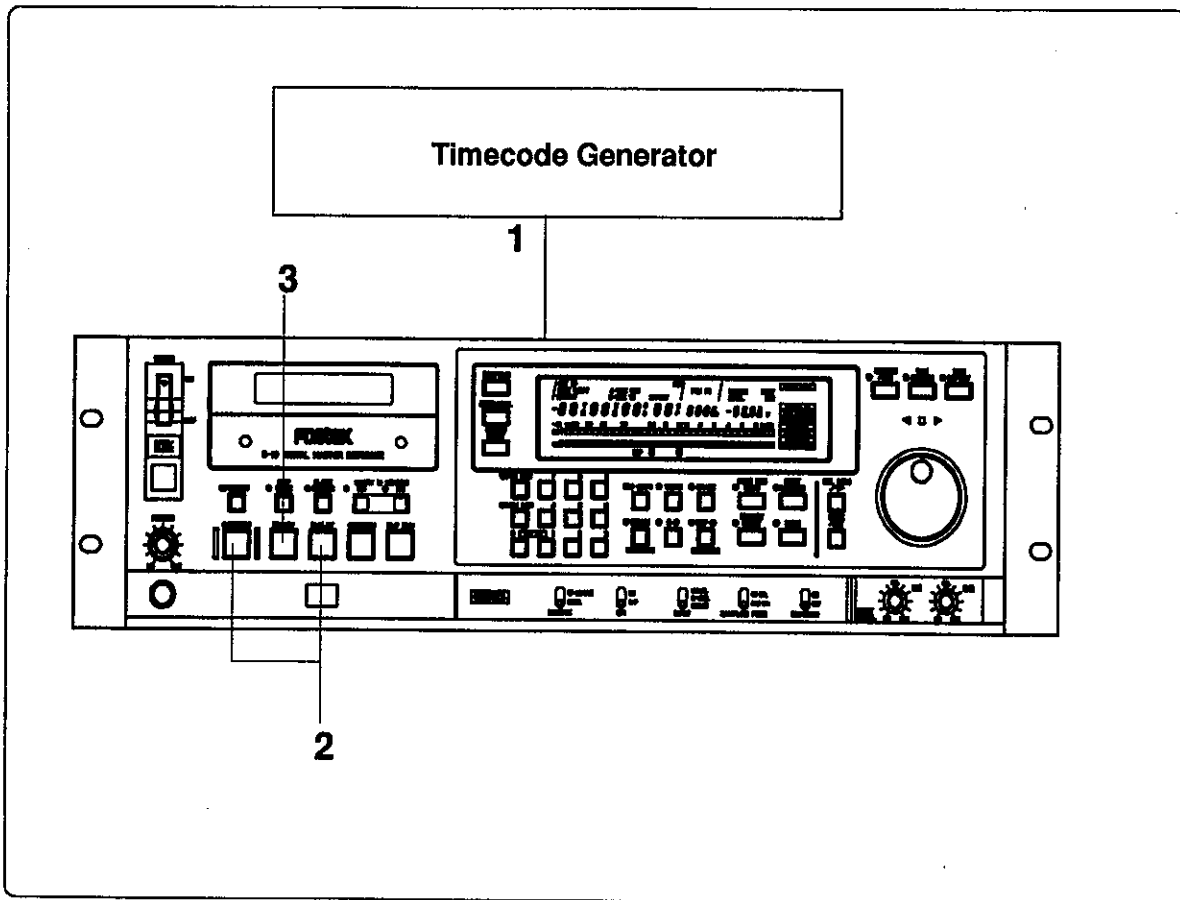
Operating procedures

1. Start the externally connected TC Generator.

2. Press the PLAY button while pressing the RECORD button.

3. Press the STOP button to finish recording.

<NOTES>

* A continuous time code cannot be recorded if the recording is stopped midway
(ASSEMBLE recording only is possible in this equipment).

* Since the D-10 do not have a video sync input, there will be a slight clock deviation between
the time code (LTC) being recorded and the internal sampling clock.
Therefore, if a tape recorded in the D-10 is chase locked in equipment with video sync
capabilities such as the D-30 and then played back by video sync the OFFSET figure often
drifts away gradually. To correct this when using a D-30, use the frame sync playback mode.

7. Output of A-Time or PRO R-Time converted to time code (LTC)

A-Time or PRO R-Time recorded on tape can be converted to time code (LTC) and output after installing the 8333 in the D-10. However, note that discontinuous or missing PRO R-Time cannot be guaranteed to function accurately.

Converting A-Time or PRO R-Time to time code (LTC) and output will be explained below.

7-1. Setup procedure

1. Select whether A-Time or PRO R-Time should be converted into DAT TIME. DAT TIME to be converted to time code is selected by [401 -xxx] which is newly added to the SET UP mode.

    If PRO R-Time is to be converted, select [401 -000] "IEC AUTO" or [401 -001]"IEC MANUAL."

    If "IEC AUTO" is selected, it will be output at same frame rate as at recording regardless to the setup frame rate but if [401 -001] had been selected, any desired frame rate can be setup by procedures in "Item 2" below (For example, even though frame rate recorded on tape is 25 frames, it can be set to 29.97 Drop Frame).

    Select [401 -002]"A-Time TC" to convert A-Time, then it can be set to the desired frame rate by the same procedure as for "IEC MANUAL."

    <IMPORTANT NOTE>

    When a 30 frame LTC (ND and DF) is input, this equipment will internally, forcibly acknowledge and record it as a 29.97 frame LTC.

    However, when "IEC AUTO" is selected via [401 -xxx], no problem will occur as it is designed to automatically correct this discrepancy and output it in 30 frames.

    On the other hand, when "IEC MANUAL" is selected and furthermore, set to "Fr 30" or "Fr 30 dF" by [402 -xxx], it will result in double correction and as a result, a time code difference in address from that at recording it will be output (there will be a difference between the sound and time code address).

    To avoid this, when a tape recorded with a 30 frame time code is to be played back with the D-10 or other DAT recorder, be sure to set the playback time code frame rate to "29.97". If the D-10 is to be used, set [402 -xxx] to either "Fr 29.97 df" or "Fr 29.97".

    * For details, refer to "5-2. Changes/Additions in SET UP mode" in the backs of this manual.

    * When PRO R-Time or A-Time is converted to time code and output, this time code figure can be put on display by switching with the DISP TIME key (Display of TC, A-Time TC).

Model 8333 (TC/RS-422 Interface Card) Owner's Manual

2. Setup frame rate of time code to be output.

When [401 -001]"IEC MANUAL" or [401 -002]"A-Time TC" is selected under the above setup, the desired frame rate can be set.

Set this via the SET UP mode [402 -xxx].

* For details on setup, refer to "5-2. Changes/additions in SET UP mode" in the back of this manual.

3. Setup the time code output in the pause mode, and time code type in the F FWD/ REWIND modes, as required.

* For details on setup, refer to "5-2. Changes/Additions in SET UP mode" in the back of this manual.

* Use the SET UP modes [403 -xxx] or [404 -xxx] to setup.

8. Control by RS-422

The D-10 can be controlled with a computer or other controlling equipment through the REMOTE connector. Because a THRU connector is also provided, multiple connections of the D-10 can be controlled via the ES-Bus.

8-1. Control of the D-10 from the D-30 using the SONY 9 pin protocol

Here, an editing system using the D-30 "AUTO EDIT with PLAYER" mode, and with the D-10 as the PLAYER and the D-30 as the RECORDER will be explained as an example.

<NOTES>

* Because a vari-pitch function is not provided in the D-10 main unit, a vari command from the video editor will be ignored.

* Because there is no video sync input in the D-10, if the house sync system is used for phase modifying all machines in the system with the video reference, in some cases time code phase will deviate from other equipment. For example, when sound editing using a video editor and the D-10, a one frame difference could occur at the sound editing point.

* There are also messages not followed up in the 8333 protocol. For details on this, refer to "ES-Bus/SONY 9 pin protocol" in the back of this manual.

8-1-1. Connections

1. Connect the D-30 9P REMOTE-B with the D-10 REMOTE connector.

2. Connect the D-30 DIGITAL INPUT to the D-10 DIGITAL OUTPUT connector.

3. Connect the D-30 TC INPUT to the D-10 TC OUTPUT connector.

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Editing system using the D-30, and with the D-10

D-30 (RECORDER)

D-10 + 8333 (PLAYER)
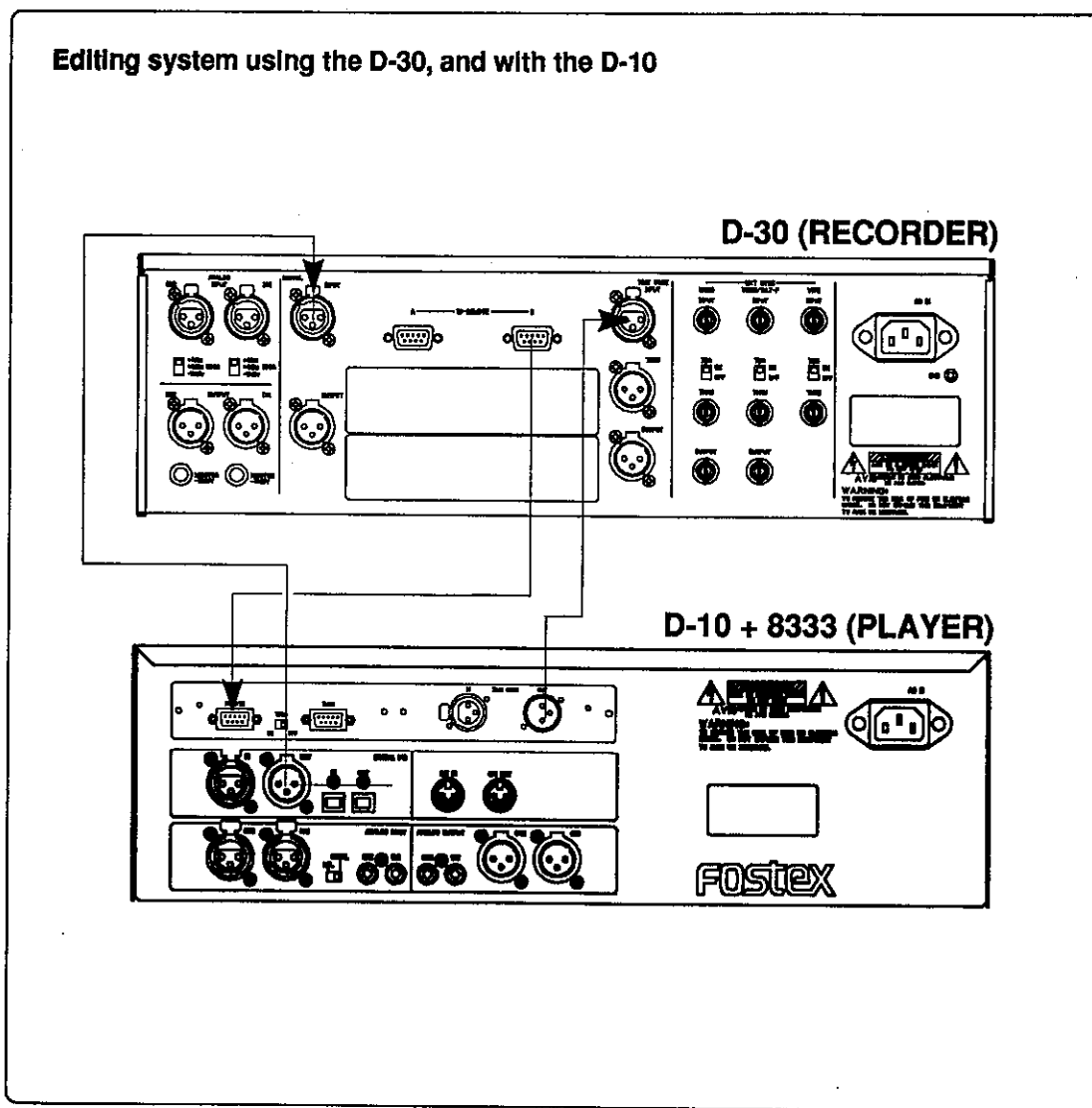
8-1-2. Setup and operating procedures

<NOTE>

Switch the D-10 front panel REMOTE selector to [LOCAL]

1. Set the D-10 communication protocol to "SONY 9 pin protocol" using [301 - ***], the new addition in the SET UP mode, to select [301 -000] (SONY 9 pin protocol).

   * To select time code played back by the D-10, please refer to "SET UP mode additional items" in the back of this manual.
   * In regards to the D-30 "AUTO EDIT with PLAYER mode," refer to the D-30 owners manual.
   * For details on "SONY 9 pin protocol," refer to "SONY 9 pin protocol" in the back of this manual.

2. Upon setup of all necessary items in above explanations, switch the D-10 front panel REMOTE selector to [9P REMOTE].

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8-2. Computer control of multiple the D-10 by the ES-Bus protocol

This section will explain a computer controlled program transmitting event system using a multiple number of the D-10.

8-2-1. Connections

1. Connect the RS-422 control signal from the computer to the remote connector of equipment number #1.

2. Connect number #1 THRU to number #2 REMOTE and repeat this connection up to the #n equipment as shown in the schematic.

3. Connect audio output (ANALOG OUT) of #1 ～ #n equipment to the mixer inputs.

8-2-2. Setup and operation

<NOTE>
Switch the D-10 front panel REMOTE selector to [LOCAL].

1. Set the communication protocol for all D-10s connected to ES-Bus protocol. Select [301 -001] (ES-Bus protocol) with [301 -xxx] which is now added to the SET UP mode (Refer to "SET UP mode additional items" in the back of this manual).
   * Refer to "5-2. Changes/additions in SET UP mode" in this manual.

2. Set the machine address of each D-10 via the SET UP mode [302 -xxx]. Each machine address can be set within the 0 ～ 36 range. The numbers must be set so that none will be duplicated among the D-10s connected.
   * For details on "ES-Bus protocol," refer to [ES-Bus protocol] in back pages of this manual.

3. Set the termination switch from the #1 through #n equipment. Termination switch on the last D-10 only must be switched ON and all others to OFF.

4. Upon completing all necessary set-up as above, switch the front panel REMOTE selector on all the D-10s to [9P-REMOTE].

   <NOTE>
   Do not forget to terminate (100 Ω) the receiving point of the controller computer. DAT message may not be correctly received if the controller is not terminated.

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Computer controlled program transmitting event system

Computer w/RS-422 (ES-bus PROTOCOL)
* Do not forget to terminate (100 Ω) the receiving point of the controller computer.

D-10 + 8333 (No. #1)

D-10 + 8333 (No. #2)

Audio Mixer

D-10 + 8333 (No. #n)

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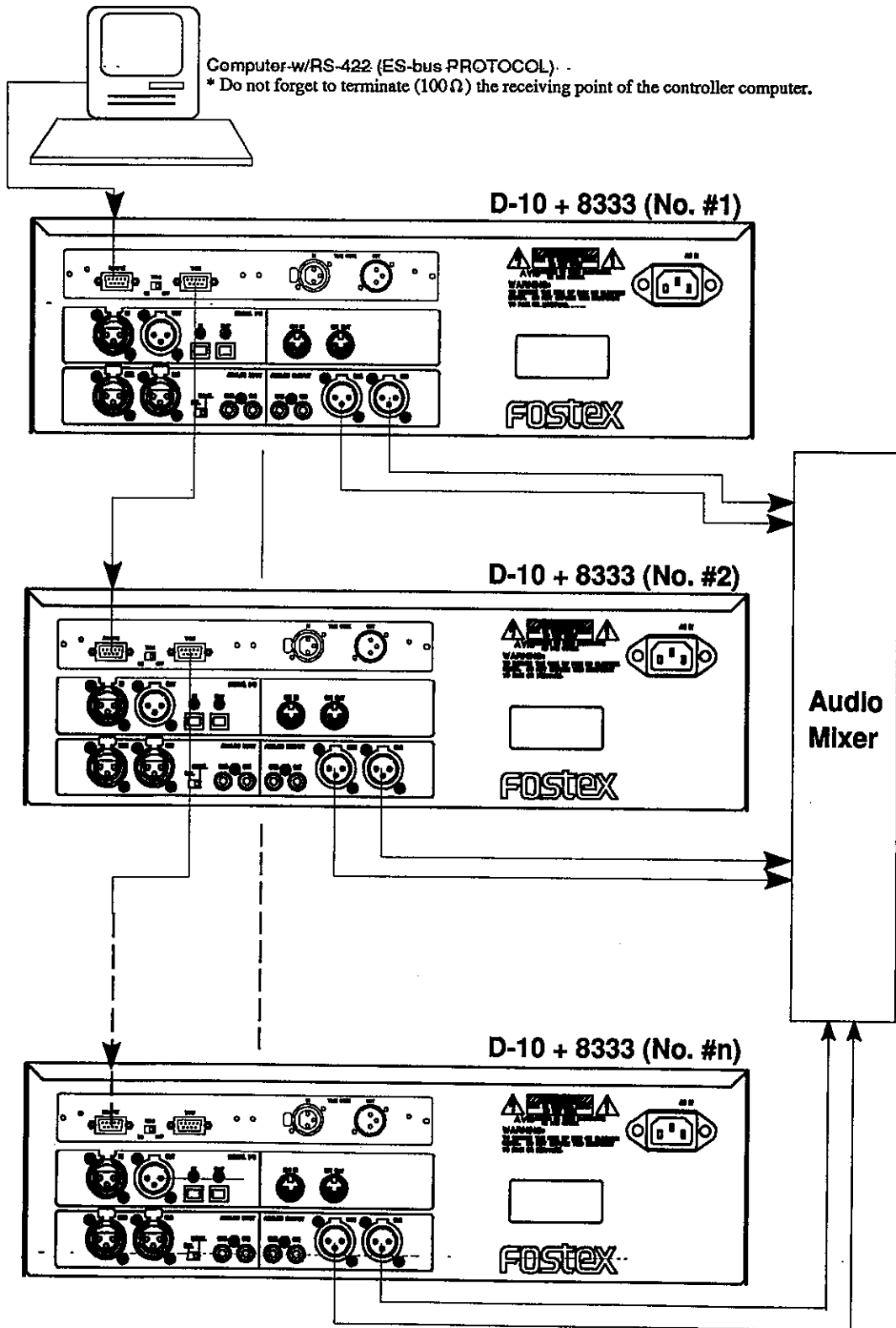
9. Specifications

RS-422 REMOTE/THRU

Connector	:D-sub 9 pin
Transmission type	:Complies to RS-422 standard specs.
Protocol	:Complies to SONY 9pin protocol or ES-bus Tech 3245 (switchable). However, escape mode only of the ES-bus machine message will be executed and non-standard messages used here should be equivalent to the SONY 9pin protocol.
REMOTE	:Controlled Device
THRU	:Through

Time code IN

Connector	:XLR-3-31 (BALANCED)
Format	:SMPTE/EBU
Standard input level	:2Vp-p
Minimum input level	:0.25Vp-p
Input impedance	:Higher than $20k\Omega$

Time code OUT

Connector	:XLR-3-32 (BALANCED)
Format	:SMPTE/EBU
Standard output level	:2Vp-p
Optimum load impedance	:Higher than 600Ω

Power supply

	:Supplied from the D-10 main unit (DC 5V, 0.2A)

* Specifications and appearance of this product subject to change without notice.

MEMO

SONY 9pin PROTOCOL／ES-bus PROTOCOL for D-10

Table of Contents

1. General

The purpose of this specification is to define the software characteristics and the hardware in relation to the Controlled Device (DAT) and the Controlling Device (Controller).

For the protocol of this system, either ES-bus handled through RS-422A or SONY 9pin PROTOCOL is selected and utilized. The hardware comply to RS-422A.

The ES-bus standard Machine Control Message is not used when it is selected for the ES-bus but the Non-Standard Communications which is effective in the ESC (escape) mode will be used. For the Non-Standard Communications used here, the SONY 9pin PROTOCOL which is almost identical to it is employed.

The difference of the SONY 9pin PROTOCOL from the standard Machine Control Message is that the parity bit, in the start - stop synchronizing system bit-serial communication, is even number parity and in the GROUP SELECT ESC mode, return messages such as ACK cannot be issued.

When the ES-bus is selected, employment of the SONY 9pin PROTOCOL for Non-Standard Communications in the ESC mode has the following advantages:

* The widely known and popular SONY 9pin PROTOCOL can be utilized in controlling a multiple number of DAT by the ES-bus.
* As the standard Machine Control Message for ES-bus is not used, the actually required ES-bus protocol messages will be only a few among the Supervisory Characters and is therefore, easy to operate.

2. System Composition

2-1. ES-bus mode

By using this protocol, a multiple number of DATs can be controlled by a single controller.
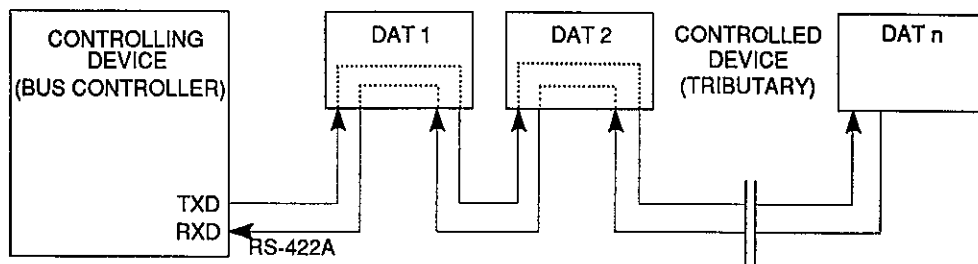
2-2. SONY 9pin PROTOCOL mode

Video editor, etc. can control in 1:1 relationship using the standard SONY 9pin PROTOCOL.
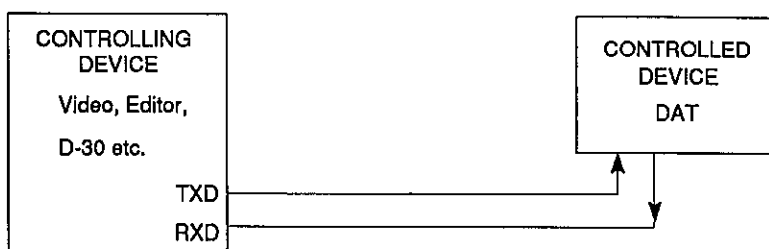
3. Format Specification of ES-bus

The following is the specification when the Fostex Model D-10 serial communication mode is selected to the ES-bus. In the ES-bus, the Controlled Device (DAT) will be called "Tributary" and the Controlling Device (Controller) will be called the "Bus Controller".

To control a Tributary, the specific Tributary is:

> * selected first
>
> * then machine control, either by entering the ESCAPE MODE with the ESC command or, carry out GROUP ASSIGN, select the objective group
>
> * then machine control within the GROUP ESCAPE MODE by the ESC command.

3-1. Hardware Specifications

> * Conforms to EIA RS-422A
>
> * Full duplex communication channel
>
> * Transmission speed: 38.4kb/s (k bits per second)
>
> * Start bit: 1 bit
>
> * Data bit: 8 bits
>
> * Stop bit: 1 bit
>
> * Parity: Even

Word Data Character:

Bit arrangement of Word Data Character will be defined as follows:

START BIT	D0 (LSB)	D1	D2	D3	D4	D5	D6	D7 (MSB)	PARITY (EVEN)	STOP BIT

"1" (MARK)
"0" (SPACE)
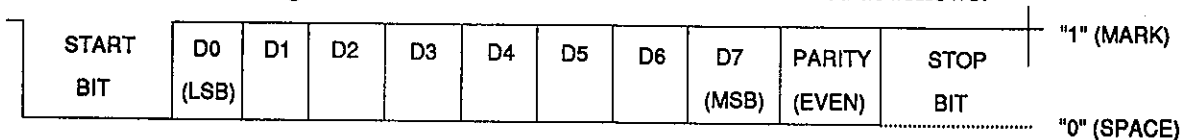
Even Parity : D0 ~ D7 and total number of "1" up to parity will be odd numbers.

Break Character:

Break Character will be generated as Space ("0" Data) consisting of 20 bit +1, -0.

At the receiving side, Space ("0" Data) up to 17 bit ~ 22 bit can be acknowledged as "Break". Space exceeding 22 bits will be handled as an error.

— 20 bit +1, -0 —

"1" (MARK)

"0" (SPACE)
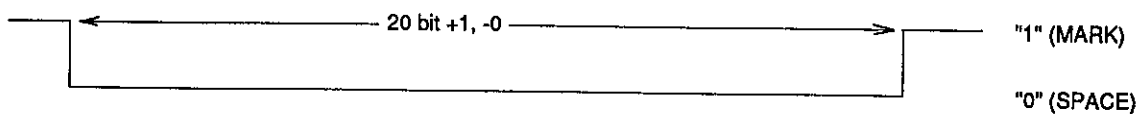
3-2. Connections

Connector pin signals between Bus Controller and Tributary are as follows:

PIN	BUS CONTROLLER	TRIBUTARY
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground
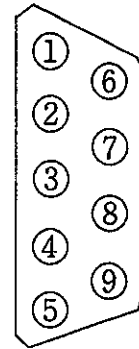
(OUTSIDE VIEW)

CONTROLLER → TRIBUTARY

* Switch ON the terminate switch on the last equipment connected.

Bus Controller (driver)

$100\,\Omega$

Tributary Receivers
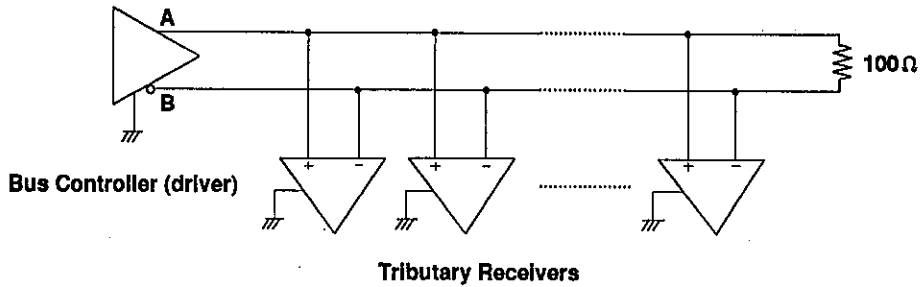
TRIBUTARY → CONTROLLER

* At least terminate with $100\,\Omega$.

Also, if reception is inferior such as when an unshielded cable is used, add about a $1\mathrm{k}\,\Omega$ resistor to R1 and R2.

Tributary Drivers (tri-state)

Bus Controller (receiver)   Bus Termination Circuit

(R1)

B'

$100\,\Omega$

A'

(R2)

Bus Termination Circuit

3
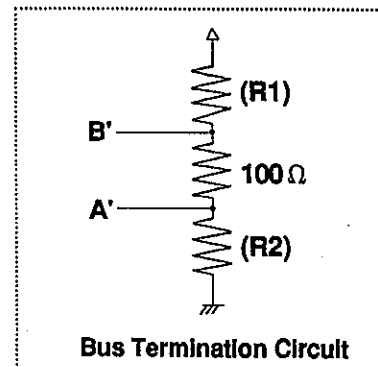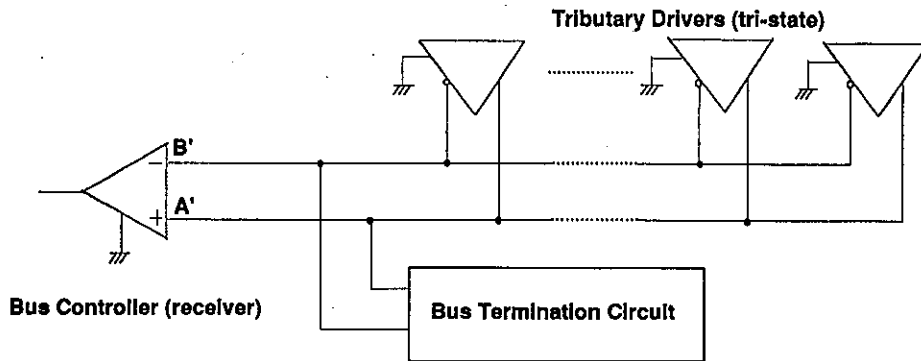
3-3. Tributary Address (DAT)

In order to control multiple numbers of Tributary (DATs) with one controller, addresses must be previously assigned and set to the Tributary.

The Tributary address is composed of two bytes and the most significant byte is transferred first. Also, the most significant bit of each byte will be fixed to binary "1".

Therefore, the address range will start from 8080h.

Each Tributary will possess two addresses of which one will be called "Select Address" and the other "Poll Address". In addition, these will be made into groups such as "Group Select Address" which can simultaneously control a multiple number of Tributary.

(1) Select Address

The least significant bit of the least significant byte which is equal to 0 is the Select Addresss.
This address will be expressed in two bytes as follows:

MSB	LSB
1xxx xxxx,	1xxx xxx0

(2) Poll Address

The least significant bit of the least significant byte which is equal to 1 is the Poll Address.
This address will be expressed in two bytes as follows:

MSB	LSB
1xxx xxxx,	1xxx xxx1

The following relationship exists between Select Address and Poll Address:

(Poll Address) = (Select Address) + 1

(3) Group Address

Address pairs 8080-8081h and 8082-8083h through 81FE-81FFh are reserved as the Group Addresses. The address (Poll Address) of which its least significant bit of the least significant byte is equal to binary 1 must not be used.

MSB	LSB
1xxx xxxx,	1xxx xxx0

(4) Discrete Address

The Tributary (DAT) address starts from 8280-8281h.

(5) Address Allocation Table

8080-8081h	Group Select- (All groups will be selected)
8082-80FFh	Group Select- (Groups #1 ~ 63 will be selected)
8180-81FFh	Group Select- (Groups #64 ~ 127 will be selected)
8280-82FFh	64 Tributaries (DATs)
Up to	
FF80-FFFFh	64 Tributaries (DATs)

In this system consisting of Models D-10 and 8333, any one of 64 types 8280-82FFh can be selected by the Set Up mode "302 -xxx".

Machine No.	Select Addresss	Poll Address
00	8280h	8281h
02	8282h	8283h
Up to		
63	82FEh	82FFh

3-4. Tributary (DAT) Operation States

Tributary (DAT) will enter one state from among the seven major states listed below.

(IDLE):

Tributary (DAT) cannot communicate in any way.

Only upon receiving the Break command it can emerge from this state.

It will be in this IDLE state at switch on of power.

(ACTIVE):

This is the state necessary to move to another operating state. Tributary (DAT) will enter this state upon receiving the Break command.

(POLL):

The Tributary (DAT) will transmit a single status byte to the bus controller and return to the ACTIVE state.

Normally, the Tributary (DAT) upon receiving an address matching the POLL address will enter the POLL state, immediately send back ACK (04h) and return to the ACTIVE state.

(SELECT):

The Tributary (DAT) will enter the communication mode with the bus controller and will occupy the bus together with the bus controller until arrival of a Break command or until a communication error occurs. While in the ACTIVE state, the Tributary (DAT) which is selected will enter this SELECT state when it receives a Select Address matching its own address.

Other Tributary (DAT) not selected will enter the IDLE state. Consequently, there will be only one Tributary (DAT) which is able to enter the SELECT state.

(ASSIGN):

The Tributary (DAT), when in the Select state, will enter this state upon receiving the GRP (01h) command. Actual Group Assign is carried out by the one byte received next, send back ACK (04h) and return to the "SELECT" state.

The following is setup by the next one byte succeeding the GRP (01h) command. The six bits from the lower bits indicates the 1 ~ 127 group numbers. In particular, all groups 1 ~ 127 are objects of "0".

The most significant bit (bit 7) represents assignment to the group and cancelling of assign, and will be assign when "1" and cancel of group assign when "0".

(GROUP SELECT):

All Tributaries (DATs) or the Tributary selected by the GROUP SELECT command will enter into the communication mode with the bus controller. In this case, because a multiple number of Tributaries are simultaneously selected, the bus controller will handle transmission only and the Tributaries (DATs) will receive only and are unable to send a reply.

Because the Tributary (DAT) which is GROUP SELECTED will be previously GROUP assigned while in the ACTIVE state, it will enter this GROUP SELECT state when it receives a Group Address matching the group address in which it belongs to or, when it receives the "Group Address 8080h all call" command.

Other Tributaries (DATs) not group selected will enter the "IDLE" state.

(ESC MODE):

Communication will be carried out between the bus controller and the Tributary (DAT) by the protocol (Non-standard communication) which is unrelated to the ES-bus standard protocol. The protocol used here conforms to the SONY 9pin PROTOCOL. However, parity bit used in the start-stop synchronous serial communication will not be odd number parity but will be even number parity identical to the ES-bus.

When the Tributary (DAT) receives ESC (03h) while in the SELECT state or GROUP SELECT state, it will send back ACK (04h) and enter this ESC MODE.

However, when it changes to this mode from the GROUP SELECT state, it will receive from the bus controller only and will not be able to send a reply.

The BREAK command only is effective in order to emerge from the ESC mode.

3-5. Supervisory Message

As shown in Figure 1, a Tributary (DAT) will enter the operating state via various communicating sequences by the Supervisory Message.

(BREAK):

Enters all Tributaries (DATs) in the ACTIVE state (Refer to Item 3-1. for details on the Break characteristics).

(ADDR-POLL):

Tributary Poll Address will enter the specified Tributary (DAT) in the POLL state.

(ADDR-SELECT):

Tributary Select Address will enter the specified Tributary (DAT) in the SELECT state.

(GROUP ADDR-SEL):

Group Select Address will enter the specified Tributary (DAT) group in the GROUP SELECT state.

6

Supervisory Characters (Management protocol)

Supervisory Character determines the communication sequence and provides the status.
These Characters are in single bytes in the 00h-7Fh range.
The following Characters can be handled by Models D-10 and 8333.

01h (GRP)	Group Assign
02h (STX)	Start of Message
03h (ESC)	Escape
04h (ACK)	Acknowledge
05h (NAK)	Negative Acknowledge
06h (BSY)	Busy
07h (RST)	Reset
08h (SVC)	Service request from Tributary
09h (TEN)	Transmit Enable

3-6. Control Procedures

(1) Selecting one machine from a multiple number of Tributaries (DATs) and machine controlling them.

1. Issue the Break command and enter all Tributaries in the ACTIVE state.

2. Carry out Address Poll of the objective Tributary (DAT) and confirm the reply from ACK (04h).
   Example: When Machine Address=2, Address Poll by 8285h.

3. After confirming ACK (04h), Address Select the above Tributary (DAT).
   Example: When Machine Address=2, Address Select by 8284h.

4. Send the ESC (03h) command, enter selected Tributary (DAT) in the ESC mode and wait for ACK (04h).

5. After receiving ACK (04h), machine control becomes possible in succeeding steps by the SONY 9pin PROTOCOL roster described in the next Chapter, as the Non-standard Message.

6. If control is to be changed to other machines, return to step 1. and repeat the procedures.

(2) Forming a group from a multiple number of Tributaries and machine controlling them.

1. Issue the Break command and set all Tributaries to ACTIVE.

2. Address Poll the objective Tributary (DAT) and confirm the ACK (04h) reply.
   Example: When Machine Address=2, Address Poll by 8285h.

3. After confirming ACK (04h), set the objective Tributary (DAT) in the "SELECT" state.

Example: When Machine Address=2, Address Select by 8084h.

4. Send the GRP (01h) command, then, send one byte of data for group setup.

Example: When setting to Group Address=1, the Tributary (DAT) from the "SELECT" state, will successively send two bytes from 0181h.

5. Issue the Break command and return all Tributaries in the "ACTIVE" state.

6. If other machines must be Group Selected, repeat above steps 1, 2, 3 and 4.

7. The objective Group Select is carried out with all Tributaries in the "ACTIVE" state.

Example: When selecting Group Address=1, send two bytes of 8082h.

8. Send the ESC (03h) command to enter the ESC mode.

9. In succeeding steps, machine control will be possible by the Roster of SONY 9pin PROTOCOL (see next Chapter) for the Non-Standard Message.

10. When changing to control of other machines, return to step 1 and repeat the necessary steps.

Fig. 1

8
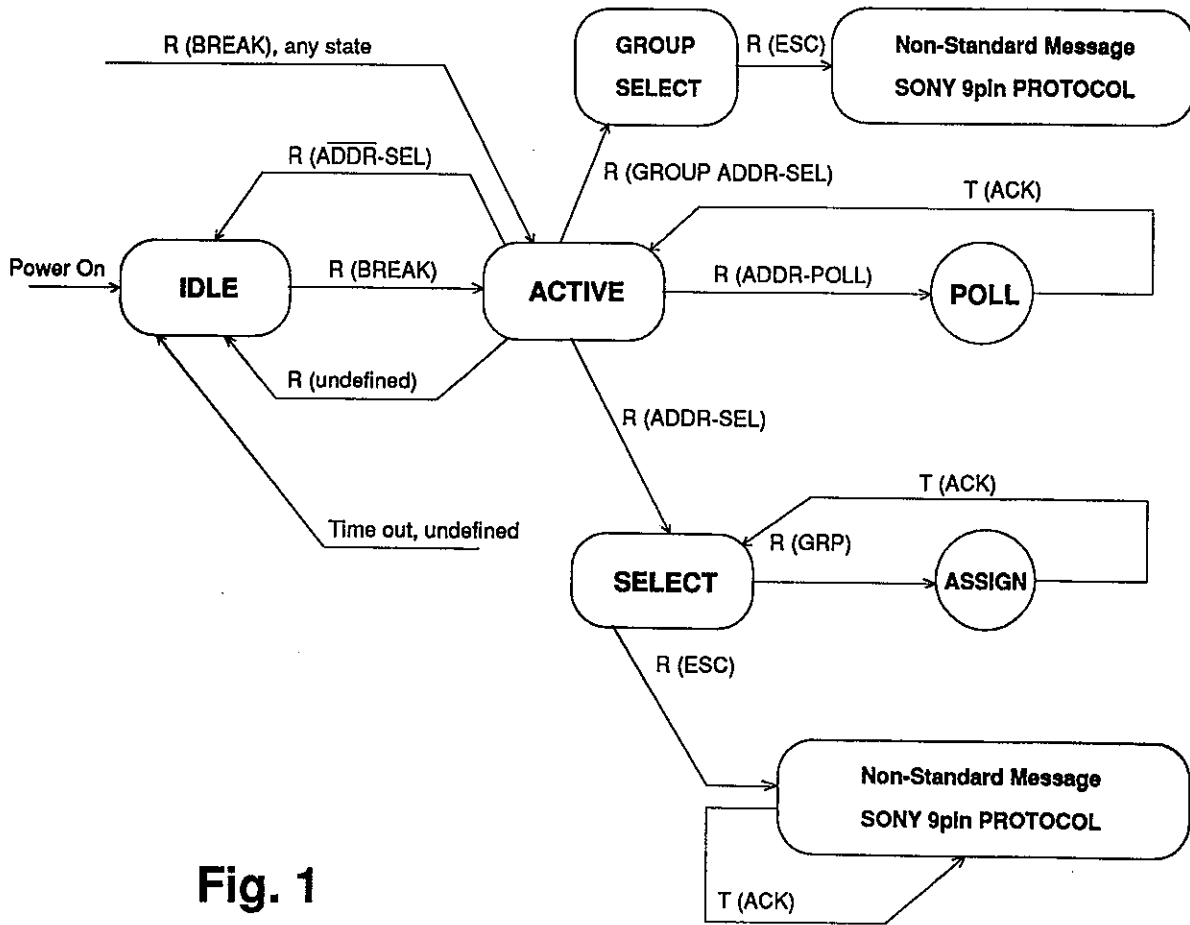
4. Format Specification of SONY 9pin PROTOCOL

The following explanations will be on the specifications when the Model D-10 serial communication mode is selected to the SONY 9pin PROTOCOL.

When the Fostex Model 8333 is installed in the D-10, a D-sub 9pin connector will be provided to enable remote control. This will allow remote control from the D-10 in conformity with the SONY 9pin PROTOCOL. Because of this, the content of the remote control signals will be explained here.

   * The controlling side equipment shall be called "Controlling Device".

   * The equipment under control shall be called "Controlled Device".

4-1. Hardware Specifications

   * Conforms to EIA RS-422A
   * Full duplex communication channel

* Transmission speed:	38.4kb/s (k bits per second)
* START BIT:	1 bit
* DATA BIT:	8 bits
* STOP BIT:	1 bit
* PARITY:	ODD

Word Data Character:

Bit composition of Word Data Character is defined as follows.

1 start bit + 8 data bits + 1 parity bit + 1 stop bit

START BIT	D0 (LSB)	D1	D2	D3	D4	D5	D6	D7 (MSB)	PARITY (EVEN)	STOP BIT	"1" (MARK)
											"0" (SPACE)
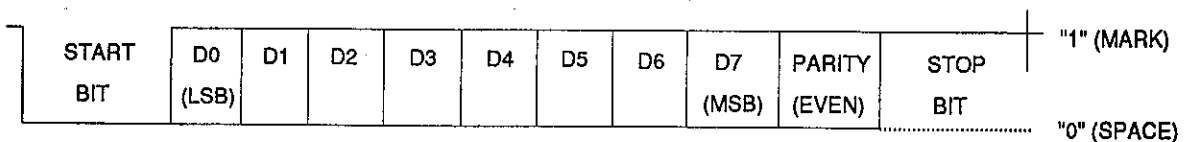
ODD PARITY : D0 ~ D7 and total of PARITY "1" will be in odd numbers.

4-2. Command Block Format

Communication between the Controlling Device and Controlled Device is carried out in the format shown below.

CMD-1 (MSD)	DATA COUNT (LSD)	CMD-2	DATA-1		DATA-15 (MAX)	CHECKSUM
1 BYTE		1 BYTE	1 BYTE	....	1 BYTE	1 BYTE

CMD-1 (4 BITS)

Indicates the figures matching the command function and communicating method.

CMD-1	Function	Direction
0	SYSTEM CONTROL	T → R
1	RETURN FOR 0, 2, 4 OF CMD-1	T ← R
2	TRANSPORT CONTROL	T → R
4	PRESET/SELECT CONTROL	T → R
6	SENSE REQUEST	T → R
7	SENSE RETURN	T ← R

T = Controlling device
R = Controlled device

DATA COUNT (4 BITS)

Indicates number of data bytes (Max. 15 bytes) inserted between CMD-2 and CHECKSUM.

Example: When DATA COUNT is "4".

This means that one byte of data is added to each of DATA-1, 2, 3 and 4. In this example, the command block will be as shown below.

CMD-1	DATA COUNT	CMD-2	DATA-1	DATA-2	DATA-3	DATA-4	CHECKSUM

CMD-2 (4 BITS)

Indicates figures corresponding to the names assigned to each command.

Example: When CMD-1 is "2" and CMD-2 is "04".

It means the STANDBY OFF command.

For details on the CMD-2 name, refer to the "COMMAND detail list" in back pages of this Manual.

DATA-1 ~ 15 (1 BYTE EACH)

If data is added to the command specified by CMD-1 and CMD-2, figures matching its content will be indicated.

Example: For the "41 · 30 : EDIT PRESET" command.

```
    41 · 30 : EDIT PRESET
     |
     └──────── DATA COUNT
```

10

As DATA COUNT is "1", it can be seen that one byte of data corresponding to DATA-1 is added to the command.

BIT-7 ~ 0 of DATA-1 is defined as shown in schematic below and if INSERT EDIT of A2 and A1 had been preset, BIT 6, 1 and 0 will be set to "1" and DATA-1 will be "43".

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
	INSERT	ASSEMBLE			TC	A2	A1

_____ MSD _____/_____ LSD _____/
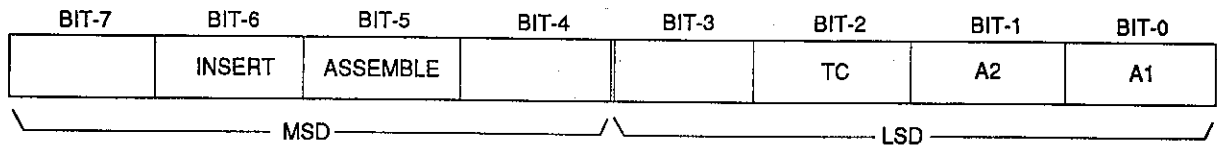
CHECKSUM (1 BYTE)

A maximum of 17 bytes from first byte of the command block up to immediately before the CHECKSUM are added and lowest 8 bits of the result will be displayed.

4-3. Communicating Specifications

As a rule, the Controlling Device will have the initiative over communication between the Controlling and Controlled Device.

The following command will be sent back within 9 msec. when the Controlled Device receives a command from the Controlling Device.
* On receiving an undefined or communication error command: NAK + ERROR DATA
* On receiving a command requesting a DATA: COMMAND + DATA
* On receiving a command not requesting a DATA: ACK

The Controlling Device must not output the next command before receiving a reply from the Controlled Device against the transmission command.

The Controlling Device must not insert transmission intervals longer than 10 msec. between each byte within one command block.

Should the Controlling Device receive "NAK + ERROR DATA" from the Controlling Device, the command block transmission must be stopped immediately and resumed after 10msec. elapse.
However, if the ERROR DATA is an "UNDEFINED COMMAND", the command block can be immediately transmitted without waiting 10 msec.

The Controlled Device must transmit the reply command within 9 msec. after completely receiving the command block from the Controlling Device.
Accordingly, if the Controlling Device receives no reply from the Controlled Device after more than 10msec. elapse upon receiving the command block, it will assume that communication was not correct between the Controlling Device and Controlled Device, and thus takes proper measures.

4-4. Connections

Connector signals between the Controlling Device and Controlled Device are as follows.

PIN	BUS CONTROLLER	TRIBUTARY
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground
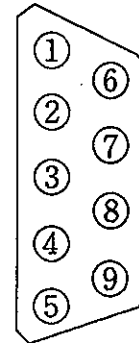
(OUTSIDE VIEW)

A and B are defined as shown below.

$A < B \rightarrow "1"(MARK)$

$A > B \rightarrow "0"(SPACE)$
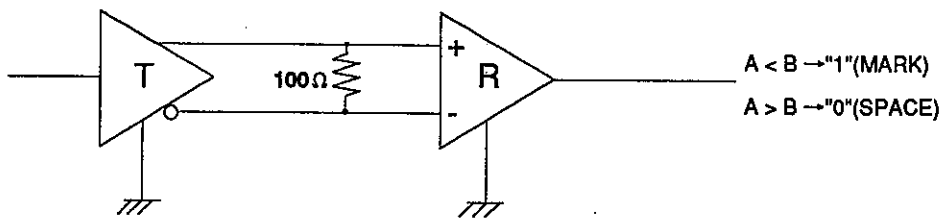
Straight type cable must be used.

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5. Command Roster

<NOTE>

The ☐ and ▓ symbols at left end of each command in the list indicates whether this command is effective or not in this version of the software. (☐ = Not effective, ▓ = Effective)

5-1. System Control

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
▓	0 0	1 1	DEVICE TYPE REQUEST	1 x		1 1	DEVICE TYPE
▓	0 x	F 2	DAT SYSTEM CONTROL 1 *	1 x		F 2	DAT SYSTEM CONTROL 1 DATA *
▓	0 x	F 3	DAT SYSTEM CONTROL 2 *	1 x		F 3	DAT SYSTEM CONTROL 2 DATA *
▓	0 x	F 4	DAT SYSTEM CONTROL 3 *	1 x		F 4	DAT SYSTEM CONTROL 3 DATA *

00 · 11 : DEVICE TYPE REQUEST
1X · 11 : DEVICE TYPE

The "00 · 11 : DEVICE TYPE REQUEST" is a command asking for specifications of the ATR used as the CONTROLLED DEVICE and upon receiving this command, the CONTROLLED DEVICE adds more than two bytes of data which informs its own specifications, to the "1X · 11 : DEVICE TYPE" command and returns this to the CONTROLLING DEVICE.

    * Details on the DAT SYSTEM CONTROL will be explained in a separate section.

    * DEVICE TYPE D-10 shall be 12 11 F* 10.

F2 :24 Frame
F1 :25 Frame
F0 :30 or 29.97 Frame

5-2. Transport Control

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
▓	2 0	0 0	STOP	1 0		0 1	ACK
▓	2 0	0 1	PLAY	1 0		0 1	ACK
▓	2 0	0 2	REC	1 0		0 1	ACK
▓	2 0	0 4	STANDBY OFF	1 0		0 1	ACK
▓	2 0	0 5	STANDBY ON	1 0		0 1	ACK
▓	2 0	0 F	EJECT	1 0		0 1	ACK
▓	2 0	1 0	FAST FWD	1 0		0 1	ACK
▓	2 x	1 1	JOG FWD	1 0		0 1	ACK
▓	2 x	1 2	VAR FWD	1 0		0 1	ACK
▓	2 x	1 3	SHUTTLE FWD	1 0		0 1	ACK
▓	2 0	2 0	REWIND	1 0		0 1	ACK
▓	2 x	2 1	JOG REV	1 0		0 1	ACK
▓	2 x	2 2	VAR REV	1 0		0 1	ACK
▓	2 x	2 3	SHUTTLE REV	1 0		0 1	ACK
▓	2 0	3 0	PREROLL	1 0		0 1	ACK
▓	2 x	3 1	CUE WITH DATA	1 0		0 1	ACK
▓	2 0	4 0	PREVIEW (AUTO REC PREVIEW)	1 0		0 1	ACK
▓	2 0	4 2	AUTO EDIT (AUTO REC)	1 0		0 1	ACK
▓	2 0	6 0	FULL EE OFF	1 0		0 1	ACK
▓	2 0	6 1	FULL EE ON (INPUT MONITOR)	1 0		0 1	ACK

	2 0	6 4	EDIT OFF	1 0	0 1	ACK (Ver2.20 ~)
	2 0	6 5	EDIT ON	1 0	0 1	ACK (Ver2.20 ~)

10 · 01 : ACK

The ACKNOWLEDGE command returned by the CONTROLLED DEVICE upon receiving a command from the CONTROLLING DEVICE.

20 · 00 : STOP
20 · 04 : STANDBY OFF
20 · 05 : STANDBY ON

The commands for entering the CONTROLLED DEVICE into the above listed modes. The "20 · 04 : STANDBY OFF" command is effective only in the STOP mode.

20 · 01 : PLAY

The command for putting the CONTROLLED DEVICE in the PLAY mode. If it is in the INSTANT START READY state, it will enter the INSTANT START PLAY mode.

20 · 02 : REC

The command for entering the CONTROLLED DEVICE recording channel in the REC mode.

20 · 0F : EJECT

The command for cassette ejection of the CONTROLLED DEVICE.

20 · 10 : FAST FWD

The command for running the CONTROLLED DEVICE at maximum FORWARD winding.

2X · 11 : JOG FWD
2X · 12 : VAR FWD
2X · 13 : SHUTTLE FWD
2X · 21 : JOG REV
2X · 22 : VAR REV
2X · 23 : SHUTTLE REV

The commands for running the CONTROLLED DEVICE at tape speeds compliant to the SPEED DATA given by DATA-1 and DATA-2. This tape speed can be calculated by the equation below:

$$TAPE\ SPEED = 10^{(N/32-2)}$$

N: SPEED DATA (DECIMAL)

Tape speed of the D-10 is assigned by DATA-1 only and if it was also assigned by DATA-2, this will be ignored.

Example:

TAPE SPEED	SPEED DATA

STILL .... 0 (00H) ~ 44 (2CH)

0.5 times speed .... 45 (2DH) ~ 59 (3BH)

1 time speed ....60 (3CH) ~ 69 (45H)

2 times speed ....70 (46H) ~ 76 (4CH)

5 times speed ....77 (4DH) ~ 89 (59H)

9 times speed ....90 (5AH) ~ 95 (5FH)

12.5 times speed ....96 (60H) ~ 99 (63H)

15 times speed ....100 (64H) ~ 106 (6AH)

<NOTE>

In the case of the D-10, the tape speed will be approximate to the above calculation result .

20 · 20 : REWIND

The command for running the CONTROLLED DEVICE at maximum REVERSE winding speed.

20 · 30 : PREROLL

The command for positioning tape in the CONTROLLED DEVICE to the point determined by subtracting the length in seconds set by the "44 · 31 : PREROLL TIME PRESET" command from the IN POINT data corresponding to the time code figure stored in IN ENTRY memory by the "40 · 10 : IN ENTRY" command.

2X · 31 : CUE UP WITH DATA

The command for positioning the CONTROLLED DEVICE tape at point specified by DATA-1 ~ DATA-2. DATA-5 and DATA-6 are optional.

DATA-1		DATA-2		DATA-3		DATA-4		DATA-5		DATA-6	
10 FRAME	1 FRAME	10 SECOND	1 SECOND	10 MINUTE	1 MINUTE	10 HOUR	1 HOUR	16 bit FRACTION (L)		16 bit FRACTION (H)	
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD	MSB	LSB	MSB	LSB

<NOTE>

CUE UP WITH DATA and other TC DATA formats consist of the following three types depending on number of DATA Bytes.

Specifying 4 bites of data

DATA 1	10 FRAME	1 FRAME
DATA 2	10 SECOND	1 SECOND
DATA 3	10 MINUTE	1 MINUTE
DATA 4	10 HOUR	1 HOUR

DATA-1	
BIT-7	CF
0	OFF
1	ON

Specifying 5 bytes of data

DATA 1	10 FRAME	1 FRAME
DATA 2	10 SECOND	1 SECOND
DATA 3	10 MINUTE	1 MINUTE
DATA 4	10 HOUR	1 HOUR
DATA 5	1/80 FRAME FRACTION BIT (Hex)	

DATA-1 BIT-6	DF
0	OFF
1	ON

0 ~ h'4F

Specifying 6 bytes of data

DATA 1	10 FRAME	1 FRAME
DATA 2	10 SECOND	1 SECOND
DATA 3	10 MINUTE	1 MINUTE
DATA 4	10 HOUR	1 HOUR
DATA 5	16 BIT FRACTION (L)	
DATA 6	16 BIT FRACTION (H)	

The 16 BIT FRACTION DATA is expressed as
1 FRAME = 1/h'10000

When the CONTROLLED DEVICE is entered in the INSTANT START mode ON state by the "01 · F3 · 41 : INSTANT START MODE ON" command, the playback sound, with the point specified by DATA-1 ~ DATA-6 as the INSTANT START point, is automatically stored in RAM and entered in the INSTANT START READY mode.

20 · 40 : PREVIEW (AUTO REC PREVIEW)

Upon receiving this command, the CONTROLLED DEVICE starts sequence operation identical to·the main unit AUTO REC rehearsal mode.

20 · 42 : AUTO EDIT (AUTO REC)

Upon receiving this command, the CONTROLLED DEVICE starts sequence operation identical to the main unit AUTO REC mode.

20 · 60 : FULL EE OFF

The command for setting the CONTROLLED DEVICE monitor output to REPRO.

20 · 61 : FULL EE ON

The command for setting the CONTROLLED DEVICE monitor output to INPUT.

20 · 64 : EDIT OFF

The command for cancelling the REC mode.

20 · 65 : EDIT ON

Originally, this is the command for entering in the EDIT REC mode the channel specified by the 4X · 30 : EDIT PRESET command from the CONTROLLED DEVICE but in the D-10, this will enter it in the ASSEMBLE REC mode.

<NOTE>

EDIT PRESET shall be fixed in the ASSEMBLE mode and STATUS DATA will be 27h. Therefore, although "INSERT"is specified by the 4X · 30 (EDIT PRESET) command, the

STATUS DATA will remain at 27h. In other words, the EDIT ON command in the D-10 will be ASSEMBLE REC.

5-3. Preset Command

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
4 0		0 8	TIMER-1 RESET	1 0		0 1	ACK
4 0		1 0	IN ENTRY (MEMORY 0 ENTRY)	1 0		0 1	ACK
4 0		1 1	OUT ENTRY (MEMORY 1 ENTRY)	1 0		0 1	ACK
4 6		1 4	IN DATA PRESET (MEMORY 0 PRESET)	1 0		0 1	ACK
4 6		1 5	OUT DATA PRESET (MEMORY 1 PRESET)	1 0		0 1	ACK
4 0		1 8	IN + SHIFT (MEMORY 0 + SHIFT)	1 0		0 1	ACK
4 0		1 9	IN - SHIFT (MEMORY 0 - SHIFT)	1 0		0 1	ACK
4 0		1 A	OUT + SHIFT (MEMORY 1 + SHIFT)	1 0		0 1	ACK
4 0		1 B	OUT - SHIFT (MEMORY 1 - SHIFT)	1 0		0 1	ACK
4 0		2 0	IN FLAG RESET	1 0		0 1	ACK
4 0		2 1	OUT FLAG RESET	1 0		0 1	ACK
4 0		2 4	IN RECALL	1 0		0 1	ACK
4 0		2 5	OUT RECALL	1 0		0 1	ACK
4 4		3 1	PREROLL TIME PRESET	1 0		0 1	ACK
4 1		3 6	TIMER MODE SELECT	1 0		0 1	ACK

<NOTE 1>

IN and OUT MEMORIES will be, respectively, assigned to MEMORY 0 and MEMORY 1 of Model D-10.

<NOTE 2>

EDIT PRESET will be accepted only in the ASSEMBLE MODE. Therefore, STATUS DATA of EDIT PRESET will be 00h or 27h.

40 · 10 : IN ENTRY (MEMORY 0 ENTRY)
40 · 11 : OUT ENTRY (MEMORY 1 ENTRY)

The commands for presetting in MEMORY 0 or MEMORY 1 the AUDIO IN POINT or OUT POINT data which is displayed in the CONTROLLED DEVICE as the TIME CODE data figure.

40 · 14 : IN DATA PRESET (MEMORY 0 PRESET)
40 · 15 : OUT DATA PRESET (MEMORY 1 PRESET)

The command for presetting in MEMORY 0 or MEMORY 1 the figures given by DATA-1 ~ DATA-6. DATA-5 and DATA-6 are optional. Refer to command "2X · 31 : CUE UP WITH DATA" for data format.

40 · 18 : IN + SHIFT (MEMORY 0 + SHIFT)
40 · 19 : IN - SHIFT (MEMORY 0 - SHIFT)

The command for increasing or decreasing one frame of the TIME CODE figure stored in MEMORY 0 as the AUDIO IN POINT.

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40 · 1A : OUT + SHIFT (MEMORY 1 + SHIFT)
40 · 1B : OUT - SHIFT (MEMORY 1 - SHIFT)

The command for increasing or decreasing one frame of the TIME CODE figure stored in MEMORY 1 as the AUDIO OUT POINT.

40 · 20 : IN FLAG RESET
40 · 21 : OUT FLAG RESET

The command for nullifying the AUDIO IN and AUDIO OUT data.

40 · 24 : IN RECALL
40 · 25 : OUT RECALL

The command for validating the AUDIO IN or AUDIO OUT data which had been nullified.

44 · 31 : PREROLL TIME PRESET

The command for presetting figures given by DATA-1 ~ 4 as the PREROLL TIME of the CONTROLLED DEVICE. However, the SEC. digits only will be set to any one of 0 ~ 59 by DATA-2 and others will be nullified.
Refer to the "2X · 31 : CUE UP WITH DATA" command for the data format.

41 · 36 : TIMER MODE SELECT

This command selects the TIMER used in the AUTO mode such as IN/OUT ENTRY, IN/OUT PRESET, PREROLL and CUE UP WITH DATA which are displayed in compliance to the DATA-1 state on the front panel.

DATA-1
00 :   TIMER MODE
01 :   TIMER-1

5-4. Status Sense

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
▓ 6 1		0 C	CURRENT TIME SENSE	7 4		0 4	LTC TIME DATA
				7 4		0 0	TIMER-1 DATA
				7 4		0 5	LTC UB DATA
				7 4		1 4	INTERPOLATED LTC TIMER DATA
				7 0		0 D	REQUEST TIME DATA MISSING
▓ 6 0		1 0	IN DATA SENSE (MEMORY 0)	7 6		1 0	IN DATA (MEMORY 0)
▓ 6 0		1 1	OUT DATA SENSE (MEMORY 1)	7 6		1 1	OUT DATA (MEMORY 1)
▓ 6 1		2 0	STATUS SENSE	7 x		2 0	STATUS DATA
▓ 6 0		3 1	PREROLL TIME SENSE	7 4		3 1	PREROLL TIME
▓ 6 0		3 6	TIMER MODE SENSE	7 1		3 6	TIMER MODE
▓ 6 0		5 0	DA INPUT SENSE	7 1		5 0	DA INPUT STATUS
▓ 6 0		5 1	DA SYS EMPH SENSE	7 1		5 1	DA SYS EMPH
▓ 6 0		5 8	DA SYS FS SENSE	7 x		5 8	DA SYS FS
				1 1		1 2	NAK

61 · 0C : CURRENT TIME SENSE

The command for requesting the USER BIT DATA or TIME DATA and the CONTROLLED DEVICE will make a reply in compliance to the DATA-1 content.

DATA-1

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
················	···············	VITC UB	LTC UB		TIMER 1	VITC TIME	LTC TIME

_____ MSD _____/ _____ LSD _____/

Reply command against requesting command are as follows:

Request command

DATA-1=01 : LTC TIME ┐
DATA-1=02 : VITC TIME ┤
DATA-1=03 : LTC + VITC ┘

DATA-1=04 : TIMER-1 ──────
DATA-1=10 : LTC UB ──────
DATA-1=20 : VITC UB ──────
DATA-1=30 : LTC UB + VITC UB ──

Reply command

"74 · 04 : LTC TIME DATA" (When time code is being correctly read in PLAY, CUE and SEARCH modes.)
"74 · 14 : INTERPOLATED LTC TIME DATA" (When time code cannot be correctly read in F FW, RWD and time code is interpolated.)
"70 · 0D : REQUEST TIME DATA MISSING" (At EJECTING and if time code is not recorded on tape.)

"74 · 00 : TIMER-1 DATA"
"74 · 05 : LTC UB DATA"
"74 · 05 : LTC UB DATA"
"74 · 05 : LTC UB DATA"

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60 · 10 : IN DATA SENSE (MEMORY 0)
60 · 11 : OUT DATA SENSE (MEMORY 1)

The commands for requesting DATA of MEMORY 0 and MEMORY 1, The CONTROLLED DEVICE will send a reply command complying to its content. For data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

Request command	Reply command
"60 · 10 : IN DATA SENSE"	"76 · 10 : IN DATA"
"60 · 11 : OUT DATA SENSE"	"76 · 11 : OUT DATA"

61 · 20 : STATUS SENSE

The command inquiring the CONTROLLED DEVICE status and DATA-1 attached to this command will specify the content of the "7X · 20 : STATUS DATA" command which should be returned.

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0

_____ MSD _____/ _____ LSD _____/
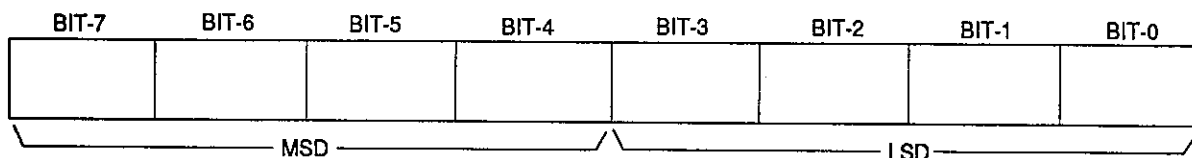
MSD (BIT-7 ~ 4):

Indicates from which data number of "7X · 20 : STATUS DATA" should be returned.
LSD (BIT-3 ~ 0):

Indicates number of bytes of data which should be returned from "7X · 20 : STATUS DATA".

Example: In the case of 2A for DATA-1 of the "61 · 20 : STATUS SENSE" command. This means, ten bytes of data from DATA No.2 of the "7X · 20 : STATUS DATA" command or, in other words, data from DATA No.2 to DATA No.B was requested.

60 · 31 : PREROLL TIME SENSE

This is the command inquiring about the PREROLL TIME setup condition of the CONTROLLED DEVICE. When the CONTROLLED DEVICE receives this command, it will return the "74 · 31 : PREROLL TIME" command and the setup condition is found by its DATA-1 ~ 4. For details, refer to "74 · 31 : PREROLL TIME" command.

60 · 36 : TIMER MODE SENSE

When the CONTROLLED DEVICE receives this command, it will return the "71 · 36 : TIMER MODE STATUS" command and its setup condition found by its DATA-1.

RETURN DATA;"71 · 36 : TIMER MODE STATUS"
                    DATA-1:   00 --- TIME CODE
                                   01 --- TIMER-1

60 · 50 : DA INPUT SENSE

The command for inquiring on the audio input signal selected state of the CONTROLLED DEVICE. When the CONTROLLED DEVICE receives this command, it sends back the "71 · 50 : DA INPUT STATUS" command and the selected state is found by this DATA-1.

RETURN DATA; "71 · 50 : DA INPUT STATUS"

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
						DA2	DA1

"1" : ANALOG AUDIO INPUT

"0" : DIGITAL AUDIO INPUT

60 · 51 : DA SYS EMPHASIS SENSE

The command for inquiring on the system setup, EMPHASIS setup state of the input digital audio signal and playback digital audio signal of the CONTROLLED DEVICE. Upon receiving these commands, the CONTROLLED DEVICE sends back a reply complying to its contents and its setup state is found by DATA-1.

The reply command answering the requested command is as follows:

Request command
"60 · 51 : DA SYS EMPHASIS SENSE"

Reply command
"71 · 51 : DA SYS EMPHASIS"

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
						DA2	DA1

"1" : EMPHASIS ON

"0" : EMPHASIS OFF

60 · 58 : DA SYS FS SENSE

The command for inquiring on the digital audio channel sampling frequency of the CONTROLLED DEVICE. Upon receiving this command, the CONTROLLED DEVICE sends back the "7X · 58 : DA SYS FS" command and the sampling frequency is found by its DATA-1.

RETURN COMMAND; "7X · 58 : DA SYS FS"
DATA-1
01 : 48kHz
02 : 44.1kHz

74 · 04 : LTC TIME DATA

When the CONTROLLED DEVICE receives the "61 · 0C : CURRENT TIME SENSE" command and if its DATA-1 is "01", then, TIME data read from the CONTROLLED DEVICE is attached to DATA-1 ~ DATA-4 of the "74 · 04 : LTC TIME DATA" command and sent back. For the data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

74 · 00 : TIMER-1 DATA

When the CONTROLLED DEVICE receives the "61 · 0C : CURRENT TIME SENSE" command and its DATA-1 is "04", then, the LINEAR TAPE COUNTER data is attached to DATA-1 ~ DATA-4 of the "74 · 00 : TIMER-1 DATA" command and sends it back. Frame figure of the reply data will always be "00". For the data format, refer to "2X · 31 : CUE UP WITH DATA" command.

74 · 05 : LTC UB DATA

When the CONTROLLED DEVICE receives the "61 · 0C : CURRENT TIME SENSE" command and its DATA-1 is "01", then, UB data read from the CONTROLLED DEVICE is attached to DATA1 ~ DATA-4 of the "74 · 05 : LTC UB DATA" command and sends it back. For the data format, refer to the following.

DATA-1		DATA-2		DATA-3		DATA-4	
2nd BINARY GROUP	1st BINARY GROUP	4th BINARY GROUP	3rd BINARY GROUP	6th BINARY GROUP	5th BINARY GROUP	8th BINARY GROUP	7th BINARY GROUP
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD
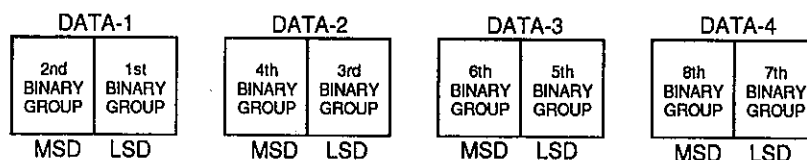
74 · 14 : INTERPOLATED LTC TIMER DATA

If DATA-1 of the "61 · 0C : CURRENT TIME SENSE" command from the CONTROLLING DEVICE is "01" and the CONTROLLED DEVICE is in other than PLAY or REC modes, TIME data read from the CONTROLLED DEVICE is attached to DATA-1 ~ DATA-4 of this command and sent back. For data format, refer to "2X · 31 : CUE UP WITH DATA" command.

70 · OD : REQUEST TIME DATA MISSING

This command is sent back if the requesting data is other than TIMER-1 data and if tape is in the following state when the CONTROLLED DEVICE receives the "61 · 0C : CURRENT TIME SENSE" command. For details, refer to the "61 · 0C : CURRENT TIME SENSE" command.

* Immediately after POWER ON until tape begins to run
* CASSETTE OUT
* Unrecorded tape

76 · 10 : IN DATA (MEMORY 0)

If the CONTROLLED DEVICE receives the "61 · 10 : IN DATA SENSE" command, MEMORY 0 in DATA-1 ~ DATA-6 of the "76 · 10 : IN DATA" command is attached and sent back. For details on the data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

76 · 11 : OUT DATA (MEMORY 1)

If the CONTROLLED DEVICE receives the "61 · 11 : OUT DATA SENSE" command, MEMORY 1 in DATA-1 ~ DATA-6 of the "76 · 11 : OUT DATA" command is attached and sent back. For details on the data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

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7X · 20 : STATUS DATA

This is the reply command against the "61 · 20 : STATUS SENSE" command and in compliance to the request, the following data is sent back.

DATA No.	BIT-7 (MSB)	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0 (LSB)
0			TAPE UNTHREAD		TAPE TROUBLE	HARD ERROR		LOCAL
1	STANDBY		STOP	EJECT	REW	FF	REC	PLAY
2	SERVO LOCK		SHUTTLE	JOG	VAR	TAPE DIR	STILL	CUE UP
3							OUT	IN
4	SELECT EE ON	FULL EE ON			EDIT	AUTO EDIT	PREVIEW	PREROLL
5			ASSEMBLE			TC	A2	A1
6								
7								IN-OUT STATUS
8				EOT		SERVO ALARM	SYSTEM ALARM	REC INHIBIT
9								
A								
B								
C							DA2	DA1
D	TAPE TOP	TAPE END	LOADING NOT COMPL					

DATA No.0/7X · 20 : STATUS DATA

DATA No.0/BIT-5 : TAPE UNTHREAD (CASSETTE OUT)

When cassette is completely outside, it will be set to "1".

DATA No.0/BIT-3 : TAPE TROUBLE (DEW)

Will be set to "1" when trouble occurs such as tape binding.

DATA No.0/BIT-2 : HARD ERROR (AUTO OFF)

Will be set to "1" when trouble occurs in the CONTROLLED DEVICE hardware.

DATA No.0/BIT-0 : LOCAL

Will be set to "1" when remote control mode is LOCAL.

DATA No.1/7X · 20 : STATUS DATA

DATA No.1/BIT-7 : STANDBY

Will be set to "1" when the CONTROLLED DEVICE is in the STANDBY ON mode.

DATA No.1/BIT-5 : STOP

Will be set to "1" when the CONTROLLED DEVICE is in the STOP mode.

DATA No.1/BIT 4 : EJECT

Will be set to "1" when the CONTROLLED DEVICE is in the EJECT mode.

DATA No.1/BIT-3 : REW

Will be set to "1" when the CONTROLLED DEVICE is in the REWIND mode.

DATA No.1/BIT-2 : FF

Will be set to "1" when the CONTROLLED DEVICE is in the FAST FORWARD mode.

DATA No.1/BIT-1 : REC

Will be set to "1" when the CONTROLLED DEVICE is in the REC mode. If "DATA No.4/ BIT-3 : EDIT" is set to "1", this bit will also be set to "1".

DATA No.1/BIT-0 : PLAY

Will be set to "1" when the CONTROLLED DEVICE is in PLAY, REC or EDIT REC modes.

DATA No.2/7X · 20 : STATUS DATA

DATA No.2/BIT-7 : SERVO LOCK

Will be set to "1" when the CONTROLLED DEVICE is in the following state:

* When the drum and capstan are servo locked in the PLAY or REC modes.

DATA NO.2/BIT-5 : SHUTTLE

Will be set to "1" when the CONTROLLED DEVICE is in the SHUTTLE mode.

DATA No.2/BIT-4 : JOG

Will be set to "1" when the CONTROLLED DEVICE is in the JOG mode.

DATA No.2/BIT-3 : VAR

Will be set to "1" when the CONTROLLED DEVICE is in the VAR mode.

DATA No.2/BIT-2 : TAPE DIRECTION

Will indicate direction of tape travel in the CONTROLLED DEVICE. In the STILL and STOP modes, tape travel direction immediately before these modes will be indicated.

> "0" = FORWARD
> "1" = REVERSE

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DATA No.2/BIT-1: STILL

Will be set to "1" when the CONTROLLED DEVICE is in the STILL state. It will, however, be reset when in the STANDBY OFF mode.

DATA No.2/BIT-0 : CUE UP

When the CONTROLLED DEVICE receives the "20 · 30 : PREROLL", "2X · 31 : CUE UP WITH DATA", "0X · F4 · 20 (21) : START ID SEARCH FWD (REV)", "0X · F4 · 22 (23) : SKIP ID SEARCH FWD (REV)", "0X · F4 · 24 (25) : END ID SEARCH FWD (REV)", and "03 · F4 · 28 : PROGRAM NUMBER SEARCH" commands and upon completing locating to head of tape, it is set to "1", and will be reset when tape transporting commands such as PLAY and SHUTTLE are received.

DATA No.3/7X · 20 : STATUS DATA

DATA No.3/BIT-1 : OUT

DATA No.3/BIT-0 : IN

When the CONTROLLED DEVICE receives either one of the commands below, the corresponding bit will be set to "1" and TIME data will be stored.

"40 · 10 : IN ENTRY",   "40 · 11 : OUT ENTRY"

"40 · 25 : OUT RECALL", "40 · 24 : IN RECALL"

DATA No.4/7X · 20 : STATUS DATA

DATA No.4/BIT-7 : SELECT EE ON

This will be set to "1" when the CONTROLLED DEVICE receives the "20 · 40 : PREVIEW" command, rehearsal REC started and the monitor output changes to INPUT.

DATA No.4/BIT-6 : FULL EE ON (INPUT)

This will be set to "1" when the CONTROLLED DEVICE monitor output is at INPUT.

DATA No.4/BIT-3 : EDIT

When the CONTROLLED DEVICE receives the "20 · 42 : AUTO EDIT" command, this will be set to "1" when EDIT REC is under way after start of AUTO EDIT, and at the same time, "DATA No.1/BIT-1 : REC" will also be set to "1".

DATA No.4/BIT-2 : AUTO EDIT (AUTO REC)

When the CONTROLLED DEVICE is in the AUTO REC operation, this will be set to "1".

DATA No.4/BIT-1 : PREVIEW

When the CONTROLLED DEVICE is in rehearsal REC operation, this will be set to "1".

DATA No.4/BIT-0 : PREROLL

When the CONTROLLED DEVICE is operating in PREROLL, CUE UP WITH DATA or ID SEARCH, this will be set to "1". When PRE-ROLLing in the AUTO REC or rehearsal REC mode, it will also be set to "1".

DATA No.5/7X · 20 : STATUS DATA

DATA No.5/BIT-5 : ASSEMBLE

DATA No.5/BIT-2 : TC

DATA No.5/BIT-1 : A2

DATA No.5/BIT-0 : A1

These will always be set to "1".

DATA No.7/7X · 20 : STATUS DATA

DATA No.7/BIT-0 : IN-OUT STATUS

If tape is traveling between the IN and OUT points when the CONTROLLED DEVICE is operating in the rehearsal REC or AUTO REC modes, this will be set to "1".

DATA No.8/7X · 20 : STATUS DATA

DATA No.8/BIT-4 : EOT

When tape remainder in the supply or takeup reels reaches zero, this will be set to "1".

DATA No.8/BIT-2 : SERVO ALARM

This will be set to "1" when there is trouble in the servos or sensors of the CONTROLLED DEVICE.

DATA No.8/BIT-1 : SYSTEM ALARM

This will be set to "1" when an error occurs in the SYSTEM of the CONTROLLED DEVICE.

DATA No.8/BIT-0 : REC INHIBIT

This will be set to "1" when cassette is set at REC INHIBIT.

DATA No.C/7X · 20 : STATUS DATA

DATA No.C/BIT-1 : DA2

DATA No.C/BIT-0 : DA1

These will always be set to "1".

DATA No.D/7X · 20 : STATUS DATA

DATA No.D/BIT-7 : TAPE TOP

This is set to "1" when the effective tape is completely wound on the SUPPLY REEL.

DATA No.D/BIT-6 : TAPE END

This is set to "1" when the effective tape is completely wound on the TAKEUP reel.

DATA No.D/BIT-5 : LOADING NOT COMPLETE

This is set to "1" during LOADING or UNLOADING of cassette in the CONTROLLED DEVICE.

71 · 36 : TIMER MODE STATUS

This is the reply command against the "60 · 36 : TIMER MODE SENSE" command from the CONTROLLING DEVICE and the CONTROLLED DEVICE attaches the TIMER mode selecting switch setup data to this command and sends it back. For details, refer to the "60 · 36 : TIMER MODE SENSE" command.

71 · 50 : DA INPUT STATUS

This is the reply command against the "60 · 50 : DA INPUT SENSE" command from the CONTROLLING DEVICE and the CONTROLLED DEVICE attaches data indicating the selected condition of the audio input signal to this command and sends it back. For details, refer to the "60 · 50 : DA INPUT SENSE" command.

71 · 51 : DA SYS EMPHASIS STATUS

This is the reply command against the "60 · 51 : DA SYS EMPHASIS SENSE" command from the CONTROLLING DEVICE and the CONTROLLED DEVICE attaches the system setup EMPHASIS data to this command and sends it back. For details, refer to the "60 · 51 : DA SYS EMPHASIS SENSE" command.

7X · 58 : DA SYS FS

This is the reply command against the "6X · 58 : DA SYS FS SENSE" command from the CONTROLLING DEVICE and the CONTROLLED DEVICE attaches the digital audio sampling frequency data and sends it back. For details, refer to the "6X · 58 : DA SYS FS SENSE" command.

11 · 12 : NAK

This is the NOT ACKNOWLEDGE command returned to the CONTROLLING DEVICE when the CONTROLLED DEVICE receives errors shown below, and any one of the DATA-1 bit will be set depending on the error content.

DATA-1

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
TIME OUT	FRAMING ERROR	OVERRUN ERROR	PARITY ERROR		CHECKSUM ERROR		UNDEFINED ERROR

6. Roster of Exclusive Commands

6-1. System Test 1 Command for DAT Only

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
0 1	F 0	6 0	PCM ERROR CONDITION SENSE	1 5	F 0	6 0	PCM ERROR CONDITION STATUS

15 · F0 · 60 : PCM ERROR CONDITION STATUS

DATA No.	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
1	8 FRAME TOTAL NUMBER OF C1 PARITY (L)							
2	8 FRAME TOTAL NUMBER OF C1 PARITY (H)							
3	PEAK C1 PARITY OF 16 FIELDES							
4							MUTE	

6-2. System Control 1 Command for DAT Only

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
0 1	F 2	A 2	TIME CODE MODE SENSE	1 2	F 2	A 2	TC MODE SELECT STATUS
0 X	F 2	C 1	CUE WITH A-TIME	1 0		0 1	ACK
0 2	F 2	D 1	CURRENT TIME SENSE	1 X	F 2	D 1	LTC TC/A-TIME

0X · F2 : SYSTEM CONTROL 1 REQUEST
1X · F2 : SYSTEM CONTROL 1 DATA

"0X · F2 : SYSTEM CONTROL 1 REQUEST" is a command peculiar to the CONTROLLED DEVICE and there is nothing common with other models. This is a command for instructing system setting and requesting the setup data of the CONTROLLED DEVICE in accordance to content of DATA-1 attached to this command.

Upon receiving this command, the CONTROLLED DEVICE attaches the data requested by the "1X · F2 : SYSTEM CONTROL 1 DATA" command and sends it back to the CONTROLLING DEVICE.

01 · F2 · A2 : TIME CODE MODE SENSE

The command inquiring for the TIME CODE MODE of the CONTROLLED DEVICE.
This is the reply command against the 12 · F2 · A2 : "01 · F2 · A2 : TIME CODE SENSE" command.

0X · F2 · C1 : CUE WITH A-TIME (DATA 1 ~)

LOCATE will be executed to the A-TIME time given by DATA-2 and after. There are the following 3 types in specifying the A-TIME DATA.

Specifying 4 bytes of data

DATA-1	10 FRAME	1 FRAME
DATA-2	10 SECOND	1 SECOND
DATA-3	10 MINUTE	1 MINUTE
DATA-4	10 HOUR	1 HOUR

Specifying 5 bytes of data

DATA-1	10 FRAME	1 FRAME
DATA-2	10 SECOND	1 SECOND
DATA-3	10 MINUTE	1 MINUTE
DATA-4	10 HOUR	1 HOUR
DATA-5	1/80 FRAME FRACTION BIT (Hex)	0 ~ h'4F

Specifying 6 bytes of data

DATA-1	10 FRAME	1 FRAME
DATA-2	10 SECOND	1 SECOND
DATA-3	10 MINUTE	1 MINUTE
DATA-4	10 HOUR	1 HOUR
DATA-5	16 BIT FRACTION (L)	
DATA-6	16 BIT FRACTION (H)	

16 BIT FRACTION DATA will be expressed as 1/h'10000 of one frame.

02 · F2 · D1 : CURRENT TIME SENSE (DATA-1)

This command makes it possible to request the CONTROLLED DEVICE for A-TIME and also call in TIME CODE DATA which is less than a FRAME during RAM SCRUB.

DATA-1

04	LTC TIME SENSE
80	A-TIME SENSE

1X · F2 · D1 · 04 : LTC DATA (DATA-1 ~)

The command for returning CURRENT TIME of LTC. TC DATA can be selected from 3 types - 4 BYTE, 5 BYTE and 6 BYTE. For data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

1X · F2 · D1 · 80 : A-TIME DATA (DATA-1 ~)

The command for returning CURRENT TIME of A-TIME. A-TIME can be selected from 3 types - 4 BYTE, 5 BYTE and 6 BYTE. For data format, refer to the "2X · 31 : CUE UP WITH DATA" command.

1X · F2 · D1 · AA : TIME MISSING

If there is no data to be replied, such as at cassette unloading, TIME MISSING is returned.

6-3. System Control 2 Command for DAT Only

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
0 1 F 3	2 2		INSTANT START PREVIEW (FX)	1 0		0 1	ACK
0 1 F 3	2 4		RAM REPEAT (FX)	1 0		0 1	ACK
0 1 F 3	4 0		INSTANT START MODE OFF	1 0		0 1	ACK
0 1 F 3	4 1		INSTANT START MODE ON (FX)	1 0		0 1	ACK
0 1 F 3	4 2		AUTO REC MODE OFF (FX D-10)	1 0		0 1	ACK
0 1 F 3	4 3		AUTO REC MODE ON (FX D-10)	1 0		0 1	ACK
0 1 F 3	4 5		RAM SCRUB ON (FX)	1 0		0 1	ACK
0 1 F 3	4 6		RAM SCRUB RELOAD (FX)	1 0		0 1	ACK
0 1 F 3	4 7		LOCATE AND PLAY (FX)	1 0		0 1	ACK
0 2 F 3	8 0		OPERATION MODE STATUS SENSE	1 X F 3		8 0	OPERATION MODE SENSE

(FX)   : Fostex exclusive command.
(FX D-10)   : Command for Fostex D-10 only.

0X · F3 : SYSTEM CONTROL 2 REQUEST
1X · F3 : SYSTEM CONTROL 2 DATA

The "0X · F3 : SYSTEM CONTROL 2 REQUEST" command is peculiar to the CONTROLLED DEVICE and there is nothing common with other models. This is a command for instructing peculiar functions and requesting the status data of the CONTROLLED DEVICE in accordance to the DATA-1 content attached to this command.

Upon receiving this command, the CONTROLLED DEVICE attaches the data requested by the "0X · F3 : SYSTEM CONTROL 2 DATA" command and sends it back to the CONTROLLING DEVICE.

01 · F3 · 22 : INSTANT START PREVIEW

When in INSTANT START MODE ON, INSTANT PREVIEW STATUS will be set to "1" if INSTANT READY is "1" and RAM playback PREVIEW will be executed. If this command is received again during execution of PREVIEW, it will return to the start point and PREVIEW will be executed again.

01 · F3 · 24 : RAM REPEAT

With the point at which the command was received as the head when in the INSTANT START MODE, RAM REPEAT STATUS will be set to "1" and RAM REPEAT is executed. Actual RAM REPEAT operation will be started when the RAM SCRUB READY STATUS BIT is set to "1". During the RAM REPEAT operation, movement within the RAM playback region is possible by the JOG/SHUTTLE command. REPEAT can be ended by the transport keys other than the JOG/SHUTTLE command.

01 · F3 · 40 : INSTANT START MODE OFF

INSTANT START MODE of the CONTROLLED DEVICE is set to OFF and, at the same time, STATUS BIT of the INSTANT START MODE is set to "0".

01 · F3 · 41 : INSTANT START MODE ON

INSTANT START STATUS BIT of the CONTROLLED DEVICE is set to "1" and enters the INSTANT START MODE.

01 · F3 · 42 : AUTO REC MODE OFF (D-10 ONLY)

AUTO REC STATUS BIT of the CONTROLLED DEVICE is cleared to "0" and ends the AUTO REC MODE.

01 · F3 · 43 : AUTO REC MODE ON (D-10 ONLY)

AUTO REC STATUS BIT of the CONTROLLED DEVICE is set to "1" and then enters the AUTO REC MODE. At the same time, the INSTANT START MODE will be cancelled.

01 · F3 · 45 : RAM SCRUB ON

Taking the TC point where this command was received as the READ POINT, the RAM SCRUB STATUS BIT is set to "1" and when the RAM SCRUB READY STATUS is "1", RAM SCRUB can be executed by the normal JOG/SHUTTLE command.
RAM SCRUB can be ended by the transport keys other than JOG/SHUTTLE command.

01 · F3 · 46 : RAM SCRUB RELOAD

When this command is received during the RAM SCRUB/RAM REPEAT operation, RAM SCRUB READY will be cleared to "0" and AUDIO DATA will be reloaded centered around the present READ TIME. After reloading is finished, RAM SCRUB READY will be set to "1" and RAM SCRUB/RAM REPEAT will be restarted.

01 · F3 · 47 : LOCATE AND PLAY

When this command is received during execution of any locate operation, the LOCATE AND PLAY STATUS will be set and LOCATE AND PLAY operation is executed.

01 · F3 · 80 : OPERATION MODE STATUS SENSE

This is the command inquiring the OPERATION MODE STATUS of the CONTROLLED DEVICE. Command content of "1X · F3 · 80 : OPERATION MODE STATUS" to be sent back by DATA-1 which is attached to this command will be specified.

DATA-1

BLOCK No.7	BLOCK No.6	BLOCK No.5	BLOCK No.4	BLOCK No.3	BLOCK No.2	BLOCK No.1	BLOCK No.0

Here, data of the block corresponding to the BIT in which "1" is set by DATA-1 will be requested.
One block consists of 4 bytes of data and a maximum of 3 blocks (12 bytes) can be requested in one operation.

1X · F3 · 80 : OPERATION MODE STATUS

	DATA No	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
B L O C K 0	1	INSTANT START MODE					INSTANT START PREVIE		INSTANT START READY
	2	AUTO RAM LOAD MODE			RAM SCRUB ON	RAM REPEAT ON			RAM SCRUB READY
	3	AUTO REC MODE							
	4	LOCATE AND PLAY							

BLOCK 0 DATA No.1/1X · F3 · 80 : OPERATION MODE STATUS

DATA No.1/BIT-7 : INSTANT START MODE

When the INSTANT START MODE ON command or INSTANT START MODE is set, this will be set to "1".

DATA No.1/BIT-2 : INSTANT START PREVIEW

This is set to "1" when RAM PREVIEW of INSTANT START is executed.

DATA No.1/BIT-0 : INSTANT START READY

"1" is set when INSTANT START preparation is completed and it becomes possible to enter the PLAY mode.

BLOCK 0 DATA No.2/1X · F3 · 80 : OPERATION MODE STATUS

DATA No.2/BIT-7 : AUTO-RAM LOAD MODE

During the INSTANT START MODE or normal operating mode, "1" will be set if it enters the mode for consistent data loading into the RAM during the PLAY mode.

DATA No.2/BIT-4 : RAM SCRUB ON

"1" will be set by the RAM SCRUB ON command or when operating in the RAM SCRUB MODE.

DATA No.2/BIT-3 : RAM REPEAT ON

"1" will be set by the RAM REPEAT ON command or when operating in the RAM REPEAT MODE.

DATA No.2/BIT-0 : RAM SCRUB READY

"1" will be set when AUDIO DATA required by the RAM is secured and when RAM SCRUB, RAM REPEAT becomes possible.

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BLOCK 0 DATA No.3/1X · F3 · 80 : OPERATION MODE STATUS

DATA No.3/BIT-7 : AUTO REC MODE

"1" will be set when in AUTO REC command or AUTO REC MODE.

BLOCK 0 DATA No.4/1X · F3 · 80 : OPERATION MODE STATUS

DATA No.4/BIT-7 : LOCATE AND PLAY

During LOCATE operation, "1" will be set when the LOCATE AND PLAY command is received. When LOCATE is finished and entered in PLAY, it will be cleared to "0".

6-4. System Control 3 Command for DAT Only

COMMAND FROM CONTROLLING DEVICE				RETURN FROM CONTROLLED DEVICE			
CMD-1	DATA COUNT	CMD-2	NAME	CMD-1	DATA COUNT	CMD-2	NAME
0 X	F 4	2 0	START ID SEARCH FWD	1 0		0 1	ACK
0 X	F 4	2 1	START ID SEARCH REV	1 0		0 1	ACK
0 X	F 4	2 4	END ID SEARCH FWD	1 0		0 1	ACK
0 X	F 4	2 6	BLANK SEARCH	1 0		0 1	ACK
0 X	F 4	2 8	PROGRAM NUMBER SEARCH	1 0		0 1	ACK
0 X	F 4	3 0	ID ERASE	1 0		0 1	ACK
0 X	F 4	3 2	ID WRITE	1 0		0 1	ACK
0 X	F 4	3 3	PNO RENUMBER	1 0		0 1	ACK
0 1	F 4	3 6	ID AUTO REC	1 0		0 1	ACK
0 1	F 4	4 0	ID REC MODE OFF	1 0		0 1	ACK
0 1	F 4	4 1	ID REC MODE ON	1 0		0 1	ACK
0 1	F 4	4 2	ID WRITE OFFSET MODE OFF	1 0		0 1	ACK
0 1	F 4	4 3	ID WRITE OFFSET MODE ON	1 0		0 1	ACK
0 X	F 4	5 0	ID REC MODE PRESET	1 0		0 1	ACK
0 X	F 4	5 1	ID WRITE OFFSET PRESET	1 0		0 1	ACK
0 3	F 4	8 0	ID STATUS SENSE	1 X	F 4	8 0	ID STATUS
0 1	F 4	A 0	ID REHEARSAL WRITE (FX)	1 0		0 1	ACK

0X · F4 : SYSTEM CONTROL 3 REQUEST
1X · F4 : SYSTEM CONTROL 3 DATA

The "0X · F4 : SYSTEM CONTROL 3 REQUEST" command is peculiar to the CONTROLLED DEVICE and there is nothing common with other models. This command is for ID control of the CONTROLLED DEVICE in compliance to the DATA-1 content attached to this command. When the CONTROLLED DEVICE receives this command, data requested by the "1X · F4 : SYSTEM CONTROL 3 DATA" command is attached and returned to the CONTROLLING DEVICE.

0X · F4 · 20 : START ID SEARCH FWD
0X · F4 · 21 : START ID SEARCH REW

This executes START ID search. Operation is identical to when the main unit keys with the same names are pressed.

DATA-2 is an option and directly specifies number of ID's to be searched. For example, if DATA-2 is 3, ID located 3 units ahead (aft) will be searched.

If the CONTROLLED DEVICE is in "01 · F3 · 41 : INSTANT START MODE ON", playback sound is automatically written in the RAM and entered in the INSTANT START READY mode with head of the START ID to be searched as the INSTANT START point.

0X · F4 · 24 : END ID SEARCH FWD
0X · F4 · 26 : BLANK SEARCH

This executes BLANK search.

01 · F4 · 28 : PROGRAM NUMBER SEARCH

START ID with the program number indicated by DATA-2 ~ DATA-3 will be searched.

DATA-2	10 PNO	1 PNO
DATA-3	....	100 PNO

If the CONTROLLED DEVICE is in "01 · F3 · 41 : INSTANT START MODE ON", playback sound is automatically written in the RAM and entered in the INSTANT START READY mode with head of the START ID with a program number indicated by DATA-2 and DATA-3 at the INSTANT START point.

0X · F4 · 30 : ID ERASE

Should the CONTROLLED DEVICE receive this command when there is a STOP BIT in STATUS 1, START ID (BIT-6) or SKIP ID (BIT-5) specified by DATA-2 will be erased if it is located in the BOT side within 300 frames from the stop position. Also, if START ID is specified and if P NO is recorded on the tape this P NO will be erased simultaneously.

DATA-2

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
PNO ID	START ID	SKIP ID	....	....	PNO 2	PNO 1	PNO 0

BIT-7 : PNO ID

Set to "1" when erasing PRIORITY ID with program number indicated by BIT-2 ~ BIT-0.

BIT-6 : START ID

BIT-5 : SKIP ID

Set to "1" respectively, to erase START ID and SKIP ID.

BIT-2, BIT-1, BIT-0 : PNO 2, PNO 1, PNO 0

Effective only when BIT-7 is "1" and depending on the bit combination, it will be as follows:

(0, 1, 1) : END ID (OEE) will be erased.

0X · F4 · 32 : ID WRITE

Should the CONTROLLED DEVICE receive this command when STATUS 1 is in the REC-PLAY mode, ID or P NO specified by DATA-2 for that time will be recorded for a certain length of time, DATA-3 and DATA-4 are optional and they are indicating the PROGRAM NUMBER recording figures.

DATA-2

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
PNO ID	START ID	SKIP ID	....	....	PNO 2	PNO 1	PNO 0

BIT-7 :   PNO ID

> This is set to "1" when recording the PROGRAM NUMBER. However,
> PROGRAM NUMBER will be recorded if BIT-6="1" although it may be "0" in the
> D-10.

BIT-6 :   START ID

BIT-5 :   SKIP ID

> Set to "1", respectively, when recording START ID and SKIP ID.

BIT-2, BIT-1, BIT-0 :   PNO 2, PNO 1, PNO 0

Effective only when BIT-7 is "1" and depending on the bit combination, they will be as follows:

(0, 0, 1) : PROGRAM NUMBER AUTO GENERATE

> Records a figure following the preceding PROGRAM NUMBER. However, in the
> sub code insert mode, OAA will be recorded.

(0, 1, 0) : Records the PROGRAM NUMBER indicated by DATA-3 and DATA-4. However,
> in the sub code insert mode, OAA will be recorded.

	MSD	LSD
DATA-3	10 PNO	1 PNO
DATA-4	....	100 PNO

0X · F4 · 33 : PNO RENUMBER

When the CONTROLLED DEVICE receives this command, the PROGRAM NUMBER will be renumbered according to DATA-2. At the same time, PNO will also be recorded on START ID's without them.

DATA-2

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
....	....	....	ALL	....	....	INITIAL	INCREMENT

BIT-4 :   ALL RENUMBER

> Set to "1" when PNO is to be put on all START ID's. In this process,
> RENUMBERING will be started by rewinding tape to the head. This equipment
> will accept "1" only.

BIT-1 :   INTIAL NUMBER PRESET

> Set to "1" when renumbering by the DATA-3, DATA-4 figures as the initial figures.
> Set to "0" when the initial figure is "1" for renumbering. In this case, DATA-3 and
> DATA-4 will have no meaning.

BIT-0 :   AUTO INCREMENT

> Set to "1" when increasing one by one from the initial figure. This equipment will
> accept "1" only.

	MSD	LSD
DATA-3	10 PNO	1 PNO
DATA-4	....	100 PNO

01 · F4 · 36 : ID AUTO EDIT

When the CONTROLLED DEVICE receives this command and if IN POINT or INSTANT START MODE is ON, ID specified by the "0X · F4 · 50 : ID REC MODE PRESET" command will be recorded for the specified length of time from the INSTANT START POINT and stop. However, if DATA-2 of ID REC MODE PRESET is "81" or "82" and in the sub code insert mode, OAA will be recorded regardless to the setting.

01 · F4 · 40 : ID REC MODE OFF
01 · F4 · 41 : ID REC MODE ON

The command for ON/OFF of the ID REC MODE of the CONTROLLED DEVICE.

01 · F4 · 42 : ID WRITE OFFSET MODE OFF
01 · F4 · 43 : ID WRITE OFFSET MODE ON

The command for ON/OFF of ID WRITE OFFSET MODE in the CONTROLLED DEVICE.

0X · F4 · 50 : ID REC MODE PRESET

The command for specifying ID or P NO to be recorded at execution of ID AUTO EDIT.

DATA-3 and DATA-4 are optional and indicates the PROGRAM NUMBER recording figures.

DATA-2

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
PNO ID	START ID	SKIP ID	....	....	PNO 2	PNO 1	PNO 0

BIT-7 : PNO ID

This is set to "1" when recording the PROGRAM NUMBER. However, PROGRAM NUMBER will be recorded if BIT-6 = "1" although it may be "0" in the D-10.

BIT-6 : START ID

BIT-5 : SKIP ID

Set to "1", respectively, when recording START ID and SKIP ID.

BIT-2, BIT-1, BIT-0 : PNO 2, PNO 1, PNO 0

Effective only when BIT-7 is "1" and will be as follows depending on the bit combinations.

(0, 0, 1) : Records a figure following the preceding PROGRAM NUMBER.

(0, 1, 0) : Records the PROGRAM NUMBER indicated by DATA-3 and DATA-4.

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	MSD	LSD
DATA-3	10 PNO	1 PNO
DATA-4	....	100 PNO

0X · F4 · 51 : ID WRITE OFFSET PRESET

At execution of ID AUTO EDIT, the command for setting the recording position OFFSET amount in seconds and DAT FRAMES.

The OFFSET direction will be indicated by DATA-2 and, OFFSET amount by DATA-3 and DATA-4.

<NOTE>

In this equipment, OFFSET amount which can be specified is up to a maximum +/- 127 frames and should a larger figure be specified, it will be acknowledged as +127 frames or -127 frames.

DATA-2

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
							BEFORE

DATA-3	10 FRAME	1 FRAME
DATA-4	....	1 SEC

03 · F4 · 80 : DAT ID STATUS SENSE

The command inquiring ID STATUS of the CONTROLLED DEVICE. Requests the BLOCK DATA corresponding to the BIT set to "1" by DATA-2, DATA-3.

	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
DATA-2	BLOCK 7	BLOCK 6	BLOCK 5	BLOCK 4	BLOCK 3	BLOCK 2	BLOCK 1	BLOCK 0
DATA-3							BLOCK 9	BLOCK 8

One BLOCK is 4 BYTES. Therefore, MAX 3 BLOCK=12 BYTE is selectively requested at the same time.

01 · F4 · A0 : ID REHEARSAL WRITE

With the point at which this command was received as the reference, CURRENT TIME is held in the IN POINT MEMORY and REHEARSAL WRITE of the ID indicated by ID REC MODE PRESET is repeated. Throughout this process, movement up to a maximum +/- 127 frames will be possible. This can be ended by either executing ID AUTO REC ON or sending a command other than ID WRITE OFFSET PRESET.

1X · F4 · 80 : DAT ID STATUS

This is the reply command against the "03 · F4 · 80 : DAT ID STATUS SENSE" command. For content on STATUS, refer to next page and after.

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7. DAT ID STATUS
7-1. DAT ID STATUS (1)
BLOCK 0 MAIN ID DATA
BLOCK 1 SUB ID DATA

BLOCK	DATA	1/0	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
0	0		FORMAT ID		ID 1		X	FRAME ADDRESS X	X	X
		1								
		0								
	1		ID 2		ID 3		X	FRAME ADDRESS X	X	X
		1								
		0								
	2		ID 4		ID 5		X	FRAME ADDRESS X	X	X
		1								
		0								
	3		ID-6		ID 7		X	FRAME ADDRESS X	X	X
		1								
		0								
1	4		CONTROL ID PRIORTY START ID SKIP ID TOC ID				X	DATA ID X	X	X
		1								
		0								
	5		1		PACK ID		X	X	X	0
		1								
		0								
	6		ID 2 (PNO2)					ID 3 (PNO3)		
		1								
		0								
	7		1		ID 1 (PNO1)		X	X	X	1
		1								
		0								

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7-2. DAT ID STATUS (2)

BLOCK 2 PROGRAM NUMBER STATUS
BLOCK 3 START ID STATUS

BLOCK	DATA	1/0	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
2	8		PNO WRITE READY	PNO WRITE					PNO SEARCH MODE	
		1	READY	WRITING					ON	
		0							OFF	
	9		PNO RENUMBER	RENUMBER MODE		START ID SEARCHING	PNO WRITE			
		1	ON	ALL RE-NO	AUTO INC	SEARCHING	WTIRING			
		0	OFF							
	A			10 PNO				1 PNO		
		1								
		0								
	B								100 PNO	
		1								
		0								
3	C		ID WRITE READY	ID WRITE						
		1	READY	WRITING						
		0								
	D		ID ERASE READY	ID ERASE						
		1	READY	ERASING						
		0								
	E			ID REHEARSAL						
		1		REHEARSAL						
		0								
	F								ID SEARCH MODE	
		1							ON	
		0							OFF	

7-3. DAT ID STATUS (3)
BLOCK 4 SKIP ID STATUS
BLOCK 5 END ID STATUS

BLOCK	DATA	1/0	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
4	10		ID WRITE READY	ID WRITE						
		1	READY	WRITING						
		0								
	11		ID ERASE READY	ID ERASE						
		1	READY	ERASING						
		0								
	12			ID REHEARSAL						
		1		REHEARSAL						
		0								
	13								ID SEARCH MODE	
		1							ON	
		0							OFF	
5	14		ID WRITE READY	ID WRITE						
		1	READY	WRITING						
		0								
	15		ID ERASE READY	ID ERASE						
		1	READY	ERASING						
		0								
	16			ID REHEARSAL						
		1		REHEARSAL						
		0								
	17								ID SEARCH MODE	
		1							ON	
		0							OFF	

7-4. DAT ID STATUS (4)
BLOCK 6 ID SEARCH STATUS
BLOCK 7 NO USE

BLOCK	DATA	1/0	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
6	18								SEARCH MODE	
		1							ON	
		0							OFF	
	19			START ID	SKIP ID			END ID		PNO
		1								
		0								
	1A		10 DIGIT OF DIFFER NUMBER / 10 DIGIT OF TARGET PNO				1 DIGIT OF DIFFER NUMBER / 1 DIGIT OF TARGET PNO			
		1								
		0								
	1B		DIRECTION					100 DIGIT OF DIFFER NO.		
		1	REV					100 DIGIT OF TARGET PNO		
		0	FWD							
7	1C	1								
		0								
	1D	1								
		0								
	1E	1								
		0								
	1F	1								
		0								

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7-5. DAT ID STATUS (5)
BLOCK 8 ID REC STATUS
BLOCK 9 ID WRITE OFFSET

BLOCK	DATA	1/0	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
8	20		ID REC MODE					ID AUTO EDIT		
		1	ON							
		0	OFF							
	21		ID REC PRESET					PNO 2	PNO 1	PNO 0
		1	PNO ID	START ID	SKIP ID			ON		
		0						OFF		
	22		10 PNO				1 PNO			
		1								
		0								
	23									
		1								
		0								
9	24		ID WRITE OFFSET							
		1	ON							
		0	OFF							
	25									OFFSET DIR
		1								-
		0								+
	26		FRAME OF OFFSET TIME							
		1								
		0								
	27		SECOND OF OFFSET TIME							
		1								
		0								

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BLOCK No.0 : MAIN ID DATA/1X · F4 · 80 : DAT ID STATUS
   BLOCK No.0/DATA No.0 : FORMAT ID. IDI.FRAME ADDRESS
   BLOCK No.0/DATA No.1 : ID2.ID3.FRAME ADDRESS
   BLOCK No.0/DATA No.2 : ID4.ID5.FRAME ADDRESS
   BLOCK No.0/DATA No.3 : ID6.ID7.FRAME ADDRESS
   Indicates playback or recorded MAIN ID.

BLOCK No.1 : SUB ID DATA/1X · F4 · 80 : DAT ID STATUS
   BLOCK No.1/DATA No.4 : CONTROL ID PRIORITY START ID SKIP ID TOC ID.
   DATA ID
   BLOCK No.1/DATA No.5 : PACK ID
   BLOCK No.1/DATA No.6 : PROGRAM NUMBER ID2. PROGRAM NUMBER ID3
   BLOCK No.1/DATA No.7 : PROGRAM NUMBER ID1
   Indicates playback or recorded SUB ID.

BLOCK No.2 : PROGRAM NUMBER STATUS/1X · F4 · 80 : DAT ID STATUS
   BLOCK No.2/DATA No.8/BIT-7 : PNO WRITE READY
   Will be set to "1" for the period from receiving the PNO WRITE command until start of
   recording.

   BLOCK No.2/DATA No.8/BIT-6 : PNO WRITE
   Will be set to "1" for the period PROGRAM NUMBER is being recorded.

   BLOCK No.2/DATA No.8/BIT-1 : PNO SEARCH MODE
   Will be set to "1" during execution of PROGRAM NUMBER SEARCH.

   BLOCK No.2/DATA No.9/BIT-7 : PNO RENUMBER
   Will be set to "1" during execution of PROGRAM NUMBER RENUMBER.

   BLOCK No.2/DATA No.9/BIT-6, 5 : PNO RENUMBER MODE
   Each BIT will be set in compliance to effective mode of PROGRAM NUMBER
   RENUMBER.

BIT-6	MODE	BIT-5	MODE
0	PART RENUMBER	0	STATIC NUMBER
1	ALL RENUMBER	1	NUMBER AUTO INCREMENT

   BLOCK No.2/DATA No.9/BIT-4 : START ID SEARCHING
   Will be set to "1" at START ID SEARCH during execution of PROGRAM NUMBER
   RENUMBER.

   BLOCK No.2/DATA No.9/BIT-3 : PNO WRITE
   Will be set to "1" while recording the PROGRAM NUMBER.

BLOCK No.2/DATA No.A : 10 PNO.1 PNO
BLOCK No.2/DATA No.B : 100 PNO
Indicates the tape PROGRAM NUMBER.

BLOCK No.3 : START ID STATUS/1X · F4 · 80 : DAT ID STATUS

BLOCK No.3/DATA No.C/BIT-7 : ID WRITE READY

Will be set to "1" for the period from receiving the ID WRITE command up to start of recording.

BLOCK No.3/DATA No.C/BIT-6 : ID WRITE

Will be set to "1" throughout recording of START ID.

BLOCK No.3/DATA No.D/BIT-7 : ID ERASE READY

"1" will be set for the period from receiving the ID ERASE command up to start of erasing.

BLOCK No.3/DATA No.D/BIT-6 : ID ERASE

Will be set to "1" while erasing of START ID.

BLOCK No.3/DATA No.E/BIT-6 : ID REHEARSAL

"1" is set when the ID REHEARSAL command is received or when in the ID REHEARSAL MODE.

BLOCK No.3/DATA No.F/BSIT-1 : ID SEARCH

This is set to "1" throughout search of START ID.

BLOCK No.4 : SKIP ID STATUS/1X · F4 · 80 : DAT ID STATUS

BLOCK No.4/DATA No.10/BIT-7 : ID WRITE READY

Will be set to "1" for the period from receiving the ID WRITE command up to start of recording.

BLOCK No.4/DATA No.10/BIT-6 : ID WRITE

Will be set to "1" throughout recording of SKIP ID.

BLOCK No.4/DATA No.11/BIT-7 : ID ERASE READY

Will be set to "1" for the period from receiving the ID ERASE command up to start of erasing.

BLOCK No.4/DATA No.11/BIT-6 : ID ERASE

Will be set to "1" throughout erasing of SKIP ID.

BLOCK No.4/DATA No.12/BIT-6 : ID REHEARSAL

"1" is set when the ID REHEARSAL command is received or when in the ID REHEARSAL MODE.

BLOCK No.4/DATA No.13/BIT-1 : ID SEARCH

Will be set to "1" while searching SKIP ID.

BLOCK No.5 : END ID STATUS/1X · F4 · 80 : DAT ID STATUS

BLOCK No.5/DATA No.14/BIT-7 : ID WRITE READY

Will be set to "1" for the period from receiving the ID WRITE command up to start of recording.

BLOCK No.5/DATA No.14/BIT-6 : ID WRITE

Will be set to "1" while recording of END ID.

BLOCK No.5/DATA No.15/BIT-7 : ID ERASE READY

Will be set to "1" for the period from receiving the ID ERASE command up to start of recording.

BLOCK No.5/DATA No.15/BIT-6 : ID ERASE

Will be set to "1" while erasing of END ID.

BLOCK No.5/DATA No.16/BIT-6 : ID REHEARSAL

"1" is set when the ID REHEARSAL command is received or when in the ID REHEARSAL MODE.

BLOCK No.5/DATA No.17/BIT-1 : ID SEARCH

Will be set to "1" while searching for END ID.

BLOCK No.6 : ID SEARCH STATUS/1X · F4 · 80 : DAT ID STATUS

BLOCK No.6/DATA No.18/BIT-1 : SEARCH MODE

Will be set to "1" while searching for ID or PNO. Search objective is indicated in DATA No.19.

BLOCK No.6/DATA No.19/BIT-6 : START ID SEARCH

This is set to "1" while searching for the START ID. The difference up to the search objective will be indicated in DATA No.1A and No.1B.

BLOCK No.6/DATA No.19/BIT-5 : SKIP ID SEARCH

This is set to "1" while searching for the SKIP ID. The difference up to the search objective will be indicated in DATA No.1A and No.1B.

BLOCK No.6/DATA No.19/BIT-2 : END ID SEARCH

This is set to "1" while searching for the END ID. The difference up to the search objective will be indicated in DATA No.1A and No.1B.

BLOCK No.6/DATA No.19/BIT-0 : PNO SEARCH

This will be set to "1" while searching for the PROGRAM NUMBER. The PROGRAM NUMBER to be searched will be indicated in DATA No.1A and No.1B.

BLOCK No.6/DATA No.1A/BIT-7 ~ BIT-4 : 10 DIGIT OF DIFFER NUMBER/10 DIGIT OF TARGET PNO

BLOCK No.6/DATA No.1A/BIT-3 ~ BIT-0 : 1 DIGIT OF DIFFER NUMBER/1 DIGIT OF TARGET PNO

BLOCK No.6/DATA No.1B/BIT-7 : DIRECTION

BLOCK No.6/DATA No.1B/BIT-2 ~ BIT-0 : 100 DIGIT OF DIFFER NUMBER/100 DIGIT OF TARGET PNO

In the case of START/SKIP/END ID SEARCH, the difference up to the objective ID will be indicated.

In the case of PROGRAM NUMBER SEARCH, PROGRAM NUMBER of the search objective will be indicated.

BLOCK No.6/DATA No.1B/BIT-7 : SEARCH DIRECTION

Indicates direction of search at START/SKIP/END ID SEARCH.

In the REVERSE direction it will be "1" and in the FORWARD direction it will be "0".

BLOCK No.8 : ID REC STATUS/1X · F4 · 80 : DAT ID STATUS

BLOCK No.8/DATA No.20/BIT-7 : ID REC MODE

This will be set to "1" when the ID REC MODE turns ON.

BLOCK No.8/DATA No.20/BIT-2 : ID AUTO EDIT

This will be set to "1" when the ID AUTO EDIT turns ON.

BLOCK No.8/DATA No.21/BIT-7 ~ BIT-3 : ID REC PRESET

Indicates the DATA-2 content of the "4X · F4 · 50 : ID REC MODE PRESET" command.

BLOCK No.8/DATA No.21/BIT-2 ~ BIT-0 : PNO 2.PNO 1.PNO 0

Indicates the DATA-2 content of the "4X · F4 · 50 : ID REC MODE PRESET" command.

BLOCK No.8/DATA No.22 : PROGRAM NUMBER
BLOCK No.8/DATA No.23 : PROGRAM NUMBER

Indicates the DATA-3 and DATA-4 content of the "4X · F4 · 50 : ID REC MODE PRESET" command.

BLOCK No.9 : ID WRITE OFFSET/1X · F4 · 80 : DAT ID STATUS

BLOCK No.9/DATA No.24/BIT-7 : ID WRITE OFFSET MODE

If the ID WRITE OFFSET MODE is ON, it will be set to "1" and if OFF, it will be set to "0".

BLOCK No.9/DATA No.25/BIT-0 : OFFSET DIRECTION

Indicates direction in which OFFSET is attached. "1" will be set for the minus direction and "0" for the plus direction.

BLOCK No.9/DATA No.26 : FRAME OFFSET VALUE
BLOCK No.9/DATA No.27 : SECOND OFFSET VALUE

Indicates OFFSET value to be attached.

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