SANYO

INSTRUCTION MANUAL

VZU-485/232C

RS-485/232C Interface Board	**English**
RS-485/232C Schnittstellenkarte	**Deutsch**
Carte d'interface RS-485/232C	**Français**
Tarjeta de interfaz RS-485/232C	**Español**
Scheda di interfaccia RS-485/232C	**Italiano**
RS-485/232C接口板	**中国简体**
RS-485/232Cインターフェースボード	日本語

PRECAUTIONS

CAUTION: This installation should be made by a qualified service person and should conform to all local codes.

CAUTION: Changes or modifications not expressly approved by the manufacturer may void the user's authority to operate this equipment.

- Make sure to also read carefully the instruction manual for the VCR.
- The contents of this manual may be modified without prior notice or obligation.
- Please note that we disclaim any liability for damages that may have been caused by the use of this product.
- Do not use the VCR if smoke or a strange odor comes from the unit, or if it seems not to function correctly. Unplug the power cord immediately, then consult a factory-authorized service center.
- This manual shows all the commands for Sanyo time lapse VCRs and real time VCRs equipped with an RS-232C (or RS-485) connector.

  The commands apply to the functions available on each particular VCR. Therefore, if a function is not available on your VCR the corresponding command does not apply to your VCR.

  Also, there may be some functions available on your VCR that cannot be controlled by the command indicated in this manual. For detailed information, please read the VCR instruction manual.

  Keep this manual handy for later reference.
- If using the RS-485 interface to operate the VCR, it is recommended that you use a SANYO brand system controller.
- If using the RS-232C interface to operate the VCR using a computer, separate software is required. (This software is not sold by SANYO.)

For customers in Canada

This class B digital apparatus complies with Canadian ICES-003.

CONTENTS

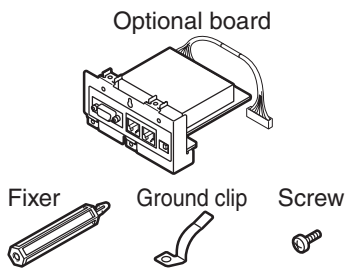
Declaration of Conformity

Model Number	:	VZU-485/232C
Trade Name	:	SANYO
Responsible party	:	SANYO FISHER COMPANY
Address	:	21605 Plummer Street, Chatsworth, California 91311
Telephone No.	:	(818) 998-7322

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  (1) this device may not cause harmful interference, and
  (2) this device must accept any interference received, including interference that may cause undesired operation.

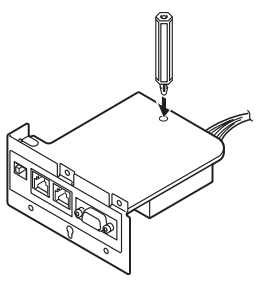
INSTALLATION OF THE BOARD

ACCESSORIES



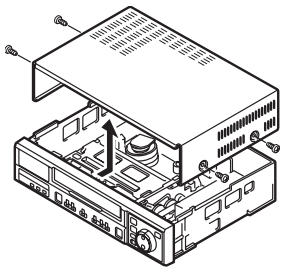
Preparation

Attach the fixer to the option board.

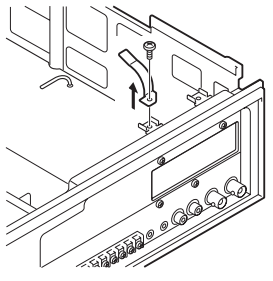


Installation

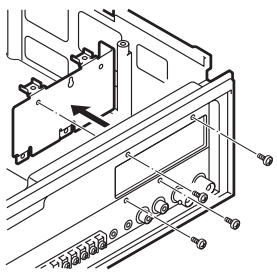
❶ Remove the four screws at the side that are securing the cabinet.



❷ Remove the screw holding the ground clip.

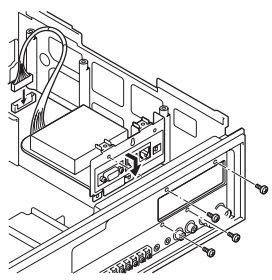


❸ Remove the screws (2 to 4) holding the cover. (Different models have different numbers of screws. The figure below shows screw positions for a model with four screws.)

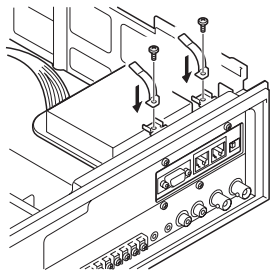


❹ Insert the connector and install the option board.

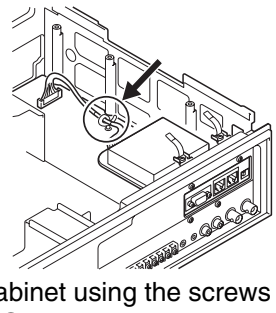
- Fix the option board to the rear terminal panel. (Use the screws removed in ❸. Be careful not to mistake the types of screws.)



❺ Install the ground clip removed in ❷ and the accessory ground clip. (Use the screw removed in ❷ and the accessory screw.)



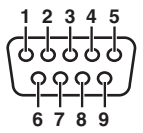
❻ Fix the harness with lugs.



❼ Install the cabinet using the screws that were removed in ❶.

INTERFACE (RS-232C)

Pin locations



Pin number	Signal	Operation	Signal direction
1	—	—	—
2	RXD	Receive data	VCR ← Computer
3	TXD	Send data	VCR → Computer
4	—	—	—
5	GND	Signal ground	—
6	—	—	—
7	RTS	Request to send	VCR → Computer
8	—	—	—
9	—	—	—

The signal transmission is compatible with RS-232C specifications.

Data format

Mode	Asynchronous
Character length	8 Bits
Data transmission speed	2400, 4800, 9600 or 19200 bps
Parity check	None
Stop bit	1 bit

The data transmission speed can only be set.

To set the data transmission speed, refer to “SETTING FOR RS-485 or RS-232C USE” on page 5.

Communication protocol

The communication is based on 1 byte units. After the computer has transmitted 1 byte, it will wait for an answer from the VCR then send the following byte of data.

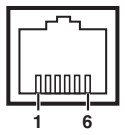
The VCR answer can be 1 byte or more, for example, the counter position consists of 6 bytes.

Connection

Connect a 9-pin D-SUB cable (sold separately) from the RS-232C connector on the rear panel to the computer serial connector.

INTERFACE (RS-485)

Pin locations



NOTE: Do not connect to phone line.

Pin number	Connector A signal	Connector B signal
1	Not used	Not used
2	Not used	Not used
3	A	B
4	B	A
5	Not used	Not used
6	Not used	Not used

A: Non-inverting driver output/receiver input

B: Inverting driver output/receiver input

Transmission line: 2 conductors

Transmission system: Half duplex

Data format

Mode	Asynchronous
Character length	8 bit
Data transmission speed	2400, 4800, 9600 or 19200 bps
Parity bit	None
Start bit	1 bit
Stop bit	1 bit

To set the data transmission speed, VCR address and **TERMINATE** switch, refer to “SETTING FOR RS-485 or RS-232C USE” on page 5.

Transmission protocol

A proprietary protocol (SSP: Security Serial Protocol) is used. Operates using a Sanyo brand system controller.

Connection

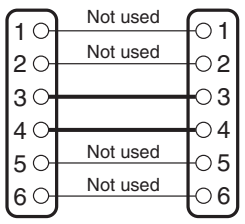
This VCR can use the straight type or crossed type connecting cable.

If using a straight type cable, connect it from the “A” to the “A” or from the “B” to the “B” RS-485 connector.

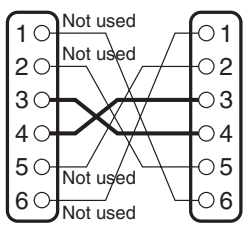
If using a crossed type cable, connect it from the “A” to the “B” or from the “B” to the “A” RS-485 connector.

Type of cable

Straight type:



Crossed type:



SETTING FOR RS-485 or RS-232C USE

The RS-485 interface can be used to operate the VCR using a SANYO brand system controller. Furthermore, the RS-232C interface can be used to operate the VCR using a computer.

NOTES:

- This can only be used when the RS-485/232C interface board (VZU-485/232C) is installed.
- Refer to the instruction manuals for the system controller and/or the computer.

Setting the Address and Data Transfer Speed

- Make this setting without a cassette tape inserted.

❶ Press the **COUNTER RESET** button for 3 seconds or more.
  ○ *"485" or "232" appears on the digital display.*

❷ Turn the **JOG** dial to select the interface being used, RS-232C or RS-485.
  ○ *"232" or "485" appears on the digital display.*
  - When setting "232", carry out step ❸ and then step ❻.

❸ Turn the **SHUTTLE** ring clockwise.

❹ Turn the **JOG** dial to set the VCR address (from 000 to 127).
  ○ *The address set appears on the digital display.*

❺ Turn the **SHUTTLE** ring clockwise.

❻ Turn the **JOG** dial to set the data transfer speed (19200, 2400, 4800, 9600).
  ○ *The data transfer speed set appears on the digital display.*

❼ When finished, Press the **COUNTER RESET** button.

NOTE:

- When the **MENU RESET** button is pressed, the setting appearing on the digital display is reset to the default setting.

Settings when using RS-485

❶ Press the **MENU** button to display the MAIN MENU.

❷ Turn the **JOG** dial to select the "9.OTHERS" line, then turn the **SHUTTLE** ring clockwise.
  ○ *The (OTHERS) menu appears.*

```
<OTHERS>
*ALARM LOG
*POWER FAILURE/DEW
*TERMINAL SET     SET1
*RS-485 SET
  STATUS INFO.    Y
  ALARM INFO.     Y
```

❸ Turn the **JOG** dial until the "STATUS INFO." setting is highlighted, then turn the **SHUTTLE** ring clockwise.

❹ Turn the **JOG** dial to set the "STATUS INFO." setting, then turn the **SHUTTLE** ring clockwise.

Y.	The VCR status information is output at the RS-485 connector.
N.	The status information is not output at the RS-485 connector.

❺ Turn the **JOG** dial until the "ALARM INFO." setting is highlighted, then turn the **SHUTTLE** ring clockwise.

❻ Turn the **JOG** dial to set the "ALARM INFO." setting, then turn the **SHUTTLE** ring clockwise.

Y.	The VCR alarm information (alarm recording start and stop) and video loss information are output at the RS-485 connector.
N.	The VCR alarm information (alarm recording start and stop) and video loss information are not output at the RS-485 connector.

❼ Press the **MENU EXIT** button.

❽ Set the **TERMINATE** switch on the back panel to the "ON" or "OFF" position

OFF side . . .	Not terminated
ON side	Terminated

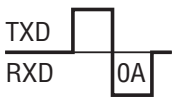
NOTE:

- When a warning state (non-recording, mechanical problem or clog detection) occurs, the warning state is output from the RS-485 connector. However, non-recording warning states are not output if "NON REC" is set to "N" in the (WARNING OUT/CONTROL SET) menu. In addition, the clog detection warning state is not output if "CLOG DETECT." is set to "N" in the (GENERAL SET) menu.

COMMANDS (RS-232C/RS-485)

The received/transmitted (RXD/TXD) signal diagram is indicated as seen from the VCR side.

Note: Some commands consist of only a single byte. The input/output signals for commands that are complete with a single byte are as follows.



The input/output signal diagrams for commands that are complete with a single byte have been omitted from the following descriptions, except for return codes.

Cautions Concerning the RS-232C Use

Before using the commands, follow the procedure below.

Send the T/L TABLE ON command (F6H) to the VCR.

The VCR will respond with ACK (0AH).

The VCR will be in the command receive mode until the T/L TABLE OFF command (F7H) is sent.

Cautions Concerning the RS-485 Use

- When a group number is set, if it does not match the group number, it will not operate.

Commands to Operate the VCR

The following commands are completed in 1 byte.

The VCR will respond with ACK (0AH). Confirm that ACK (0AH) is returned before sending the next command.

■ POWER ON/OFF (7BH)

- To turn the power ON/OFF.

■ PLAY (3AH)

- To start playback.
- If sent during recording, will start recording check mode.

■ STILL/PAUSE (4FH)

- If sent during playback, will start still mode.
- If sent during recording, will start recording pause mode.

■ STOP (3FH)

- To go to stop mode.

■ FF (ABH)

- To start fast-forward mode.
- If sent during playback, will start forward picture search mode.
- If sent during still mode, will advance of 1 image (field).
- If sent after the command to set alarm search mode, alarm scan or day/time search, will start the search or scan in the forward direction.

■ REW (ACH)

- To start rewind mode.
- If sent during playback, will start reverse picture search mode.
- If sent during still mode, will go back 1 image (field).
- If sent after the command to set alarm search mode, alarm scan or day/time search, will start the search or scan in the reverse direction.

COMMANDS (RS-232C/RS-485)

■ REV PLAY (4AH)

- If sent during playback, will start reverse playback.

■ TIMER ON/OFF (60H)

- To set the timer recording ON (timer recording standby)/OFF (timer recording canceled).

■ QUICK METHOD SECURITY LOCK ON (69H)

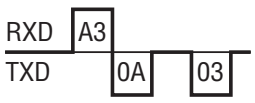
- To engage the quick method security lock.

■ QUICK METHOD SECURITY LOCK OFF (6AH)

- To cancel the quick method security lock.

■ EJECT (A3H)

- To eject the cassette.
- When the VCR receives this command, it will respond with ACK (0AH), then when the tape has been ejected, it will respond with CASSETTE OUT (03H).



■ SHARPNESS SOFT (4CH)

- If sent during playback, the image quality becomes softer.

■ SHARPNESS SHARP (4DH)

- If sent during playback, the image quality becomes sharper.

■ ON SCREEN ON/OFF (4EH)

- To set the on-screen display (superimpose display) “ON”/“OFF”.

■ MENU EXIT/AUDIO ON/SEARCH (22H)

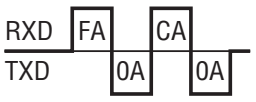
- If sent when a menu is displayed, the menu screen is canceled.
- If sent to a time lapse VCR during playback in 12- or 24-hour mode, will turn on/off the playback audio.
- If sent during stop mode, it will switch the search mode to alarm search, alarm scan, then day/time search receiving mode.

■ REC/DUB REQUEST (FAH)

Send this command before sending the REC (CAH) command.

■ REC (CAH)

- To start recording.
- If sent during single image recording mode, will record at a set field.
- Send this command only after sending the REC/DUB REQUEST (FAH) command and the VCR responds with ACK (0AH).



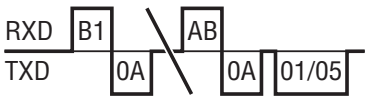
If the cassette has no erasure-prevention tab, recording will not be possible even if the VCR responds with ACK (0AH). Send the STATUS SENSE (D7H) command to confirm the state of the tape.

■ ALARM SCAN (B1H)

- To switch to alarm scan mode. Followed by a FF (ABH) or REW (ACH) command it will start the scan in the desired direction.

The VCR will go to scan mode, then when the alarm recording start point is found, it will return COMPLETION (01H).

If the beginning or end of the tape is reached, it will return NOT TARGET (05H).



COMMANDS (RS-232C/RS-485)

To use the following commands, send the command, wait for the response ACK (0AH), then send the numeric data value (30H to 39H) 1 byte at a time. Finally, send the ENTER (40H) command.

The numeric data 30H to 39H corresponds to numbers 0 to 9.

The VCR will go to search mode, then when the desired target point is found, it will return COMPLETION (01H).

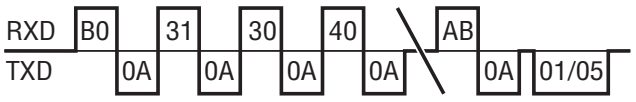
If the beginning or end of the tape is reached before the desired target point is found, it will return NOT TARGET (05H).

■ ALARM SEARCH (B0H)

- To switch to alarm search mode. Enter the desired alarm number and send the ENTER (40H) command. Send the FF (ABH) or REW (ACH) command to start the search in the desired direction.

  30H or 31H will search for the first recorded alarm.

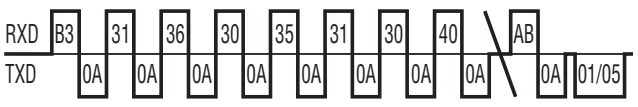
Example: To search for the 10th alarm point recorded on the tape in the FF direction from the actual (search start) point.



■ DAY/TIME SEARCH (B3H)

- To switch to day/time search mode. Enter the desired day and time and send the ENTER (40H) command. Send the FF (ABH) or REW (ACH) command to start the search in the desired direction.

Example: To search for the recording point of the 16th at 5:10.



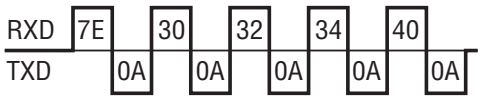
Commands to Set the VCR

■ R/P SPEED SET (7EH)

- To set the recording/playback speed mode directly.

  After sending the R/P SPEED SET (7EH) command, send 3 bytes of numeric data (30H to 39H), then the ENTER (40H) command.

Example: For 24-hour mode



■ COUNTER RESET (E2H)

- To reset the counter (0:00:00).

■ COUNTER MEMORY (E3H)

- To turn ON/OFF the counter memory.

■ CLOCK ADJUST (E0H)

- If sent during stop mode, will reset the minutes and seconds to 00 (to the closest hour). For example, if sent between 13:30:00 and 14:29:59 the clock is reset to 14:00:00.

■ TRACKING +/V. LOCK +/SHIFT ➡ (50H)

- If sent during playback, will set the tracking one step up.
- If sent during still mode, will set the vertical alignment one step up.
- If sent while the menu screen or superimpose display is being displayed, the operation is the same as for SHIFT ➡ (63H).

■ TRACKING –/V. LOCK –/SHIFT ⬇ (51H)

- If sent during playback, will set the tracking one step down.
- If sent during still mode, will set the vertical alignment one step down.
- If sent while the menu screen or superimpose display is being displayed, the operation is the same as for SHIFT ⬇ (64H).

■ TRACKING CENTER (52H)

- If sent during playback, will set the tracking to the neutral position (center).

COMMANDS (RS-232C/RS-485)

On-screen Commands

■ MENU (74H)

- If sent during stop mode, the main menu is displayed.
- If sent while a sub menu is being displayed, the menu screen is switched.

■ SHIFT ➡ (63H)

- If sent while a menu screen is being displayed, the setting item selection or setting value is accepted.
- If sent while the main menu screen is being displayed, the selected sub menu appears.
- When a superimpose display is displayed, this command will move the superimpose display toward the right. Will not operate during recording.

■ SHIFT ⬇ (64H)

- If sent while the clock or timer is being set, the previous setting item is selected.
- If sent while a sub menu screen is being displayed, the main menu appears.
- If sent while the superimpose display is being displayed, the display moves down. Will not operate during recording.

■ SET +, R/P ▲ (UP) (65H)

- If sent while a menu screen is being displayed, the setting item selection or setting will be changed or the default value will be changed (increased).
- To select the tape speed mode.

■ SET –, R/P ▼ (DOWN) (66H)

- If sent while a menu screen is being displayed, the setting item selection or setting will be changed or the default value will be changed (decreased).
- To select the tape speed mode.

■ MENU RESET (E1H)

- For each displayed menu, it will reset the menu settings to the default values.

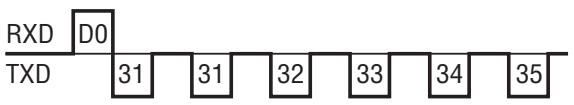
Commands to Get Information

After the commands to get information are input, the VCR will respond with the information (data) about each command.

■ COUNTER CODE (D0H)

- 6 bytes indicating the counter position will be returned.

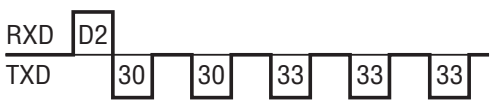
Example: For –1:23:45, 31H, 31H, 32H, 33H, 34H, 35H will be returned.
Note that the first byte will always indicate 30H for + or 31H for –.



■ HEAD TIME (D2H)

- 5 bytes indicating the usage duration of the video head will be returned.

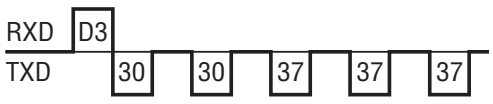
Example: For 00333 hours, 30H, 30H, 33H, 33H, 33H will be returned.



■ POWER TIME (D3H)

- 5 bytes indicating the power connected state duration will be returned.

Example: For 00777 hours, 30H, 30H, 37H, 37H, 37H will be returned.



■ T/L STATUS SENSE (D6H)

- 5 bytes indicating the VCR status will be returned. (See page 12 for details.)

■ STATUS SENSE (D7H)

- 5 bytes indicating the VCR operating mode will be returned. (See page 11 for details.)

COMMANDS (RS-232C/RS-485)

Other Commands

■ ENTER (40H)

- Sent after send all numerical values commands, this command is used to indicate the end of the input.

■ CLEAR (56H)

- To clear all commands.
- To cancel an error state.

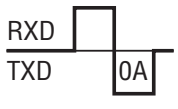
■ CLEAR ERROR (41H)

- To clear the last input (sent) numerical value command.
- To cancel an error state.

Return Code

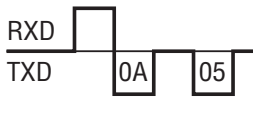
■ ACK (0AH)

- Returned by the VCR to indicate it has received the command.



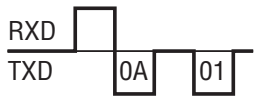
■ NOT TARGET (05H)

- Returned if during a search or scan mode the tape has been completely rewound or advanced without finding the desired target point. Also returned when the mode is canceled.



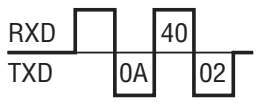
■ COMPLETION (01H)

- Returned when the target point is found after a search or scan operation.
- Returned every time a recorded alarm is found during a scan operation.



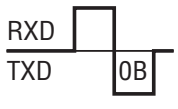
■ ERROR (02H)

- When a command of more than 2 bytes cannot be received past the second byte by the VCR, it will return an ERROR (02H) to indicate that the command is not received. Any other command send after an ERROR (02H) will not be received. However, the VCR status will be returned. To cancel this state, sent the CLEAR ERROR (41H) or CLEAR (56H) command.



■ NAK (0BH)

- Response when an undefined (or non existent) command is sent.



COMMANDS (RS-232C/RS-485)

STATUS SENSE (D7H)
Bit assignation for each byte of data

Byte 1

BIT		Content when the bit is 0.
0	ERROR	When an incorrect command is received. The CLEAR ERROR (41H) or CLEAR (56H) command must be sent before any other command can be accepted.
1	Undefined	Always 0.
2	Undefined	Always 0.
3	CASSETTE OUT	No cassette loaded in the VCR.
4	REC INHIBIT	Loaded cassette has no erasure-prevention tab.
5	Undefined	Always 0.
6	Undefined	Always 0.
7	Undefined	Always 1.

Byte 2

BIT		Content when the bit is 0.
0	Undefined	Always 0.
1	Undefined	Always 0.
2	Undefined	Always 0.
3	WARNING	Something wrong with the VCR.
4	Undefined	Always 0.
5	Undefined	Always 0.
6	Undefined	Always 0.
7	Undefined	Always 0.

Byte 3

BIT		Content when the bit is 0.
0	Undefined	Always 0.
1	Undefined	Always 0.
2	REPEAT MODE	Autorepeat recording mode.
3	Undefined	Always 0.
4	ON-SCREEN ON	The superimpose display appears on the screen.
5	COUNTER MEMORY	The counter memory of the unit is ON.
6	TIMER REC ON	Timer recording mode ON.
7	Undefined	Always 0.

Byte 4

BIT		Content when the bit is 0.
0	Undefined	Always 0.
1	REC MODE	Recording.
2	EJECT	Ejecting the cassette.
3	RVS PLAY	In reverse playback mode.
4	STOP MODE	In stop mode.
5	REW MODE	Rewinding.
6	FF MODE	Fast-forwarding.
7	PLAY MODE	Playing back.

Byte 5

BIT		Content when the bit is 0.
0	STILL MODE	In playback still or field advance mode.
1	PAUSE MODE	In record pause mode.
2	Undefined	Always 0.
3	Undefined	Always 0.
4	REVIEW MODE	Reverse picture search mode.
5	CUE MODE	Forward picture search mode.
6	Undefined	Always 0.
7	Undefined	Always 0.

COMMANDS (RS-232C/RS-485)

T/L STATUS SENSE (D6H)
Bit assignation for each byte of data

Byte 1-2-3

Recording/playback speed mode

Example:

Byte 1-2-3: Data indicating the tape speed mode in the VCR.

24-hour mode → BYTE 1 = 30
BYTE 2 = 32
BYTE 3 = 34

NOTE: The following conditions indicated by each bit are true when 1 is returned, false when 0 is returned.

Byte 4

BIT		Content when the bit is 0.
0	AUDIO ON	Time lapse VCR audio playback mode on.
1	POWER ON	The power is ON.
2	Undefined	Always 0.
3	Undefined	Always 0.
4	TIMER REC MODE ON	Timer recording mode ON or timer recording standby mode.
5	SERIES REC MODE ON	Series recording mode ON.
6	1SHOT REC MODE ON	Single image recording mode ON.
7	ALARM REC MODE ON	Alarm recording mode ON.

Byte 5

BIT		Content when the bit is 0.
0	Undefined	Always 0.
1	ALARM SEARCH SET	Alarm search being set.
2	ALARM SEARCH MODE	Alarm search mode ON.
3	Undefined	Always 0.
4	ALARM SCAN MODE	Alarm scan mode ON.
5	T/D SEARCH SET	Day/time search being set.
6	T/D SEARCH MODE	Day/time search mode ON.
7	MENU MODE	Menu is displayed.

COMMANDS (RS-232C only)

■ T/L TABLE ON (F6H)

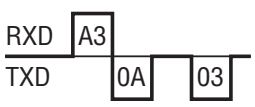
- To start the VCR control.

■ T/L TABLE OFF (F7H)

- To end the VCR control.

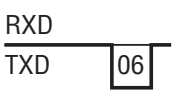
■ CASSETTE OUT (03H)

- Response when the cassette is ejected.



■ ALARM IN (06H)

- Response after an alarm has been input.



■ VCR INQ (FBH)

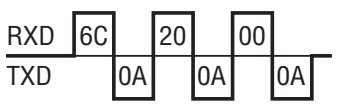
- To confirm that the connect unit is a VCR. If so, the VCR will respond with ACK (0AH).

COMMANDS (RS-485 only)

■ GROUP SET (6CH)

- Sent when grouping (making group numbers). After the VCR responds with ACK (0AH), send the 2 byte group number.

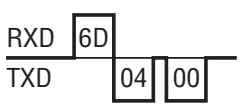
Example: Setting group number 5.



■ GROUP CHECK (6DH)

- Returns the group number.

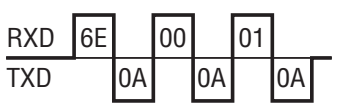
Example: For group number 2.



■ GROUP CLEAR (6EH)

- Clears the group number. After the VCR responds with ACK (0AH), send the 2 byte group number.

Example: For group number 8.



■ SET ON (7CH)

- Whatever the present state, power on or off, will set the VCR to power on state.

■ SET OFF (7DH)

- Whatever the present state, power on or off, will set the VCR to power off state.

■ STATUS LOG 1 (BFH)

- This is the header for the mode change data such as when the VCR is operated that the VCR returns to the system controller when using RS-485. (See page 14 for details.)

■ STATUS LOG 2 (BEH)

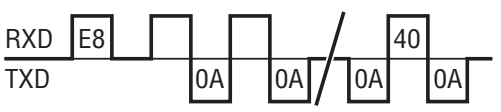
- This is the header for the mode change data such as when the VCR is operated that the VCR returns to the system controller when using RS-485. (See page 14 for details.)

■ MENU UPLOAD (D8H)

- This sends the menu settings for the VCR to the system controller. (The setting details are stored by the system controller.)

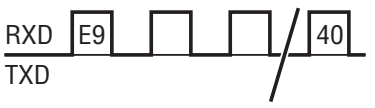
■ MENU DOWNLOAD (E8H)

- This sends the menu settings for the VCR that are being stored by the system controller to the VCR, and this changes the VCR menu settings.



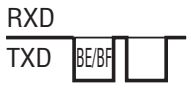
■ CLOCK (E9H)

- This sets the VCR clock based on the clock data sent from the system controller.



COMMANDS (RS-485 only)

When using the RS-485 interface and operations are carried out at the VCR, the VCR automatically returns a 2-byte data code based on the current setting.



First byte: Header (BEH or BFH)
Second byte: State change information

The second byte indications are as follows:

When the first byte is “BEH”

Bit 0 ~ 7

Mode indication.

BIT		Content when the bit is 0.
0	VIDEO LOSS	The video input signal is no longer present (VIDEO LOSS).
1	THREAD CHECK	Thread check start.
2	TAPE MANAGEMENT	Tape management start.
3	Undefined	Always 0.
4	Undefined	Always 0.
5	Undefined	Always 0.
6	Undefined	Always 0.
7	Undefined	Always 0.

When the first byte is “BFH”

Bits 0, 1, 2, 3, 4

State information.

0	0	0	0	0	No change.
1	0	0	0	0	No tape, power is on.
0	1	0	0	0	No tape, power is off.
1	1	0	0	0	Tape present, power is on.
0	0	1	0	0	Tape present, power is off.
1	0	1	0	0	Timer recording standby mode.
0	1	1	0	0	Still image playback start.
1	1	1	0	0	Recording pause.
0	0	0	1	0	Playback start.
1	0	0	1	0	Recording start.
0	1	0	1	0	Reverse playback start.
1	1	0	1	0	Forward picture search start.
0	0	1	1	0	Reverse picture search start.
1	0	1	1	0	Fast forward start.
0	1	1	1	0	Rewind start.
1	1	1	1	0	Field advance start.
0	0	0	0	1	Reverse field advance start.

Bits 5, 6

Alarm recording start and stop.

0	0	Normal
0	1	Alarm recording start
1	0	Alarm recording stop

Bit 7

Warning state.

1	A flat (non-recording, mechanical trouble or clog detection) has occurred.
0	Normal

COMMANDS TABLE (RS-232C/RS-485)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	ENTER	TRACKING +, V. LOCK +, SHIFT ➡	TIMER ON/OFF					ALARM SEARCH		COUNTER CODE	CLOCK ADJUST	
1	COMPLETION			1	CLEAR ERROR	TRACKING –, V. LOCK –, SHIFT ⬇						ALARM SCAN			MENU RESET	
2	ERROR		MENU EXIT/ AUDIO ON/ SEARCH	2		TRACKING CENTER								HEAD TIME	COUNTER RESET	
3	CASSETTE OUT			3			SHIFT ➡				EJECT	DAY/TIME SEARCH		POWER TIME	COUNTER MEMORY	
4				4			SHIFT ⬇	MENU								
5	NOT TARGET			5			SET +, R/P ▲									
6	ALARM IN			6		CLEAR	SET –, R/P ▼							T/L STATUS SENSE		T/L TABLE ON
7				7										STATUS SENSE		T/L TABLE OFF
8				8										MENU UPLOAD	MENU DOWNLOAD	
9				9			QUICK METHOD SECURITY LOCK ON								CLOCK	
A	ACK			PLAY	REV PLAY		QUICK METHOD SECURITY LOCK OFF						REC			REC/DUB REQUEST
B	NAK							POWER ON/OFF			FF					VCR INQ
C					SHARPNESS SOFT		GROUP SET	SET ON			REW					
D					SHARPNESS SHARP		GROUP CHECK	SET OFF								
E					ON SCREEN ON/OFF		GROUP CLEAR	R/P SPEED SET				STATUS LOG2				
F				STOP	STILL/ PAUSE							STATUS LOG1				

: RS-232C or RS-485 only commands.