SONY®

MULTICASSETTE SYSTEM

FLEXICART

FLEXICART

PROTOCOL AND COMMAND SPECIFICATIONS

English

2nd Edition

COPYRIGHT NOTICE

【Caution】

Flexicart Systems with ROMs of the following version or earlier do not support the commands shown below.

- ROM version
  CPU-107 : V1.1x
  CPU-118 : V1.1x
  IF-373 : V1.1x

- Commands

BT,	CMD	Command
21,	1AH	Read UB Block
21,	1BH	Write UB Block
21,	1CH	Clear UB Block
21,	61H	Sense Expanded VTR Status
21,	71H	Sense Expanded VTR Status Return
21,	6AH	Sense UBB Data
21,	7AH	Sense UBB Data Return

TABLE OF CONTENTS

1. OUTLINE

This manual describes the communication protocol to communicate commands and data through a data link between the Flexicart and PC controller.

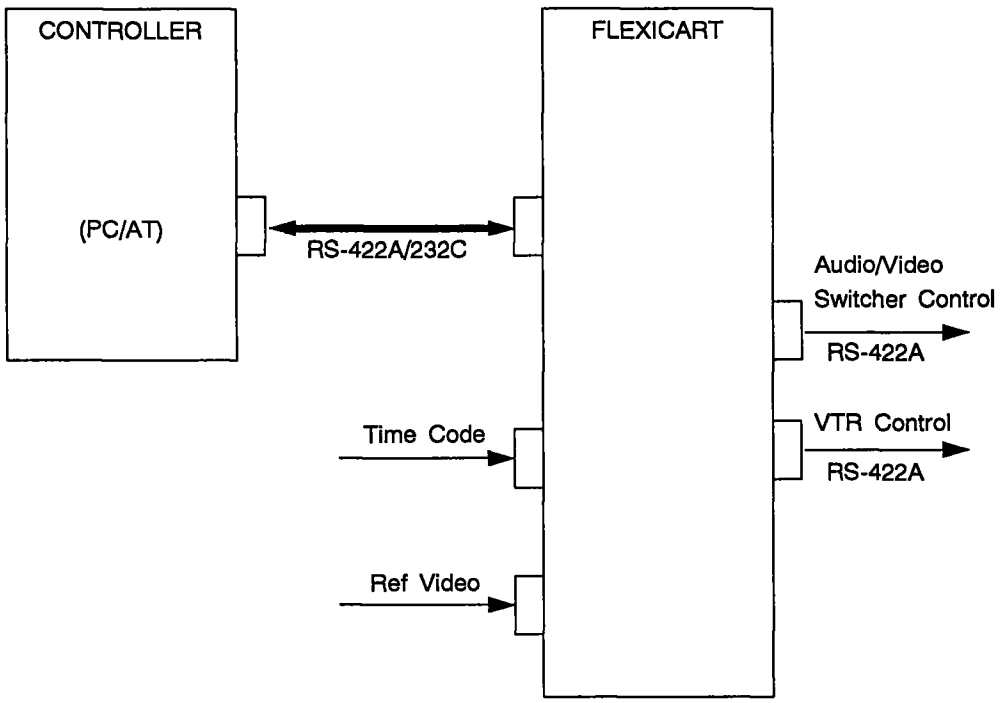


Fig.-1 FLEXICART Connection Diagram

2. COMMUNICATION SPECIFICATIONS

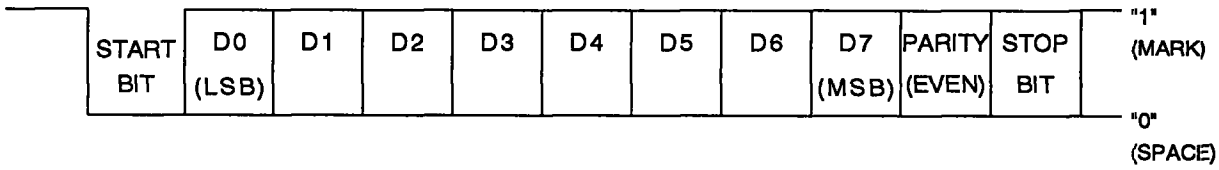
2-1. COMMUNICATION FORMAT

Asynchronous bit serial signal

- Conforms to EIA RS-232C or RS-422A (Selectable)
- Full duplex communication channel
- Transfer rate : RS-422A : 38400 bit/sec
  RS-232C : 4800, 9600 : 19200 : 38400 bit/sec (Selectable)

The bit configuration is defined below.

1) RS-422A



EVEN parity : Indicates that sum of data D0 through D7 and parity bit must be even number in all cases.

2) RS-232C

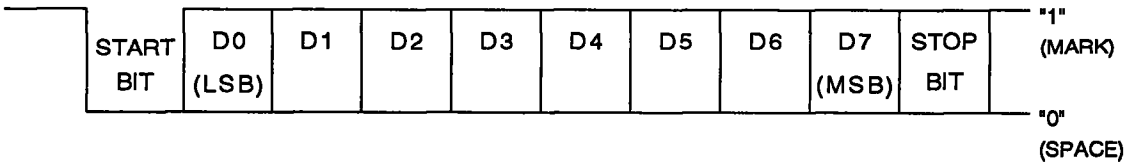


Fig.-2

2-2. CONNECTION

The pin assignments of the Flexicart Communication Port are defined as follows.

2-2-1. Remote-1 (RS-422A : CPU-107 board "CN1")

(D-SUB 9 Pin Female)

1	GND	(GND)
2	TXA Out	(TX-)
3	RXB IN	(RX+)
4	GND	(GND)
5	Non-Connection	(NC)
6	GND	(GND)
7	TXB Out	(TX+)
8	RXA IN	(RX-)
9	GND	(GND)

Fig.-3

2-2-2. Remote-2 (RS-232C : CPU-107 board "CN2")

(D-SUB 25 Pin Female)

1	Frame Ground	(FG)
2	Receive Data	(RD)
3	Transmit Data	(TD)
4	Clear to Send	(CTS)
5	Request to Send	(RTS)
6	Data Terminal Ready	(DTR)
7 ~ 19	Signal Ground	(SG)
20	Data Set Ready	(DSR)

Fig.-4

Example of connection between RS-232C and IBM-PC (or compatible)

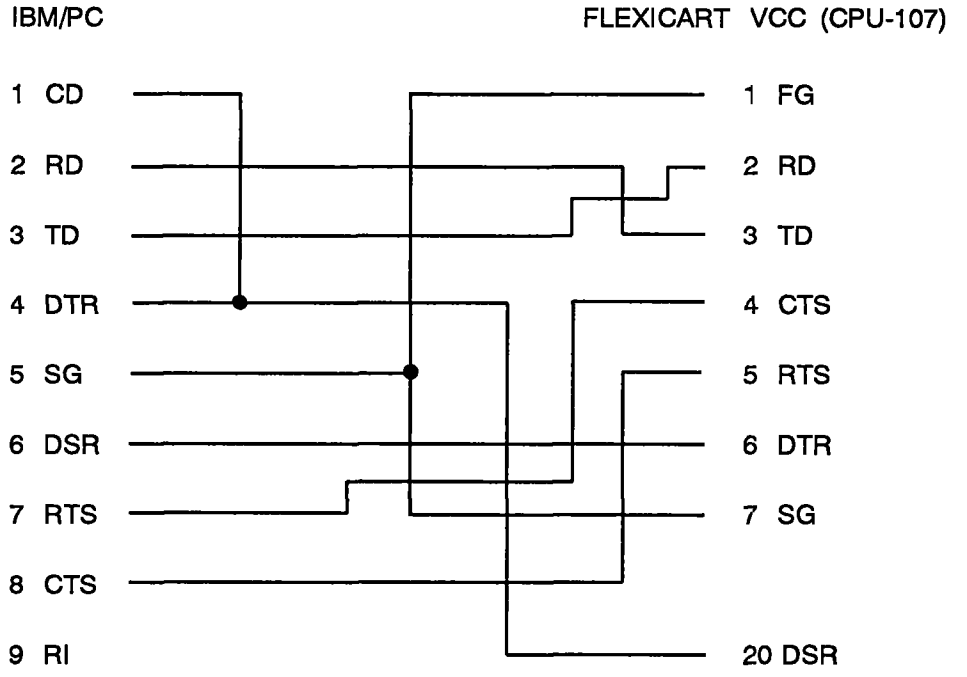


Fig.-5

3. COMMUNICATION PROCEDURE

When power is turned on, the controller is ready to communicate with DEVICE MESSAGE.

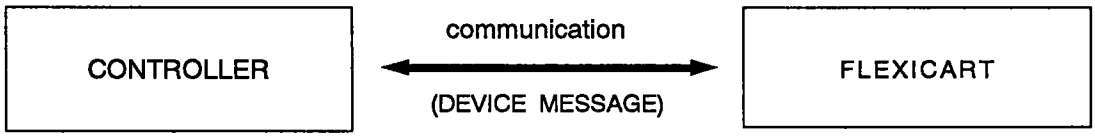


Fig.-6

4. DEVICE MESSAGE

4-1. DATA FORMAT

Data format of device message

STX + BC + UA1 + UA2 + BT + CMD block + CS

Definition of terminology

STX : Start of Text (02H)

BC : Byte Count (1 byte)
Indicates the number of bytes from UA1 to command block's last byte.

UA1 : Unit Address 1 (1 byte)
01H : FLEXICART

UA2 : Unit Address 2 (1 byte)
Indicates the units address assignment in the group which belongs to Unit Address 1.
Up to 8 Flexicarts can be controlled by using UA2.

UA1	UA2							
Code	b7	b6	b5	b4	b3	b2	b1	b0
01H	cart8	cart7	cart6	cart5	cart4	cart3	cart2	cart1

Table 4-1

BT : Block Type (1 byte)
00H : Flexicart (Control system)
01H : Flexicart (Transport system)
11H : Reserved
21H : VTR (Controlled by Flexicart)
31H : Switcher (Controlled by Flexicart)

CMD block : Command block

Varies depending on the block type of a command.

BT :	CMD block
00H :	CMD + DATA
01H :	CMD + C.C SELECT + DATA (C.C : Cassette Console)
11H :	Reserved
21H :	CMD + VTR SELECT + DATA
31H :	CMD + Switcher SELECT+ DATA

When the command is macro instruction, the macro number is added after CMD.

01H :	CMD + Macro No. + C.C SELECT + DATA
21H :	CMD + Macro No. + VTR SELECT + DATA

CS : Checksum (1 byte)

The value that the low-order 1 byte of the sum from BC to CS becomes zero.

ACK : Acknowledge Code (04H)

When a command is received correctly, ACK is returned by the Flexicart.

NAK : Negative Acknowledge Code (05H)

When the following communication errors occur, NAK code is returned by the Flexicart.

1) Frame Error
2) Parity Error
3) Overrun Error
4) Checksum Error
5) Time Out Error (40 msec.)

BUSY : Not ready to receive message (06H)

When a status data cannot be returned within 40msec during Status Sense execution, a Flexicart returns the BUSY.

4-2. COMMAND PROCESSING EXECUTION

1. When Move and Elevator Move commands are issued, the command received earlier has priority.

2. The controller must issue the next command to the Flexicart after it receives reply data from Flexicart.

3. The controller must transfer each byte in the message at an interval not exceeding 40 msec.

4. When a reply is not returned from the Flexicart for more than 40 msec after a command is sent, the controller recognize a "Time Out".

5. When the controller receives an "NAK" command from the Flexicart, it must not send a next message within 40 msec.

6. When two or more bits are set to the Selects below, the status sense is possible.

    1) C.C Select
    2) VTR Select
    3) SW Select

7. When communication errors such as checksum errors are detected in data, all devices interpret it as the commands addressed to themselves so that they return NAK command

8. When the Flexicart receives the command and two or more bits are set to its UA2,
   When the bit correspanding to the Flexcart is set to "1",
   The command is executed and ACK is not returned.
   When the bit correspanding to the Flexicart is set to "0",
   The command is ignored. (do nothing)

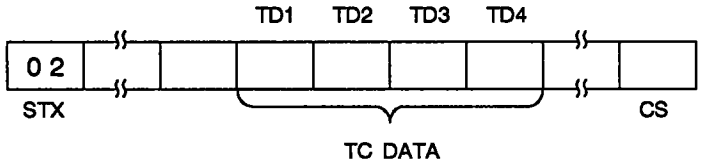
9. When the door is open, operation temporarily stops. If a macro command with a elevator movement is received, the macro is not executed and macro end information (58H : Door Open 1) is returned.

5. COMMAND BLOCK

The command block format varies depending on BT. Common items are described below.

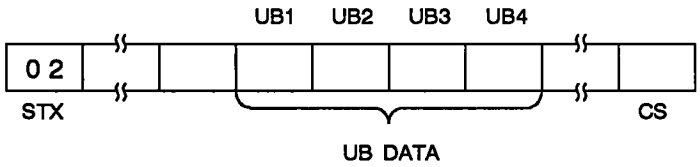
5-1. TC/UB DATA FORMAT

1) TC (Time Code) data format



	MSB	LSB	
TD1	Frame (×10)	Frame (×1)	BCD Code
TD2	Second (×10)	Second (×1)	BCD Code
TD3	Minute (×10)	Minute (×1)	BCD Code
TD4	Hour (×10)	Hour (×1)	BCD Code

2) UB (User's bit) data format



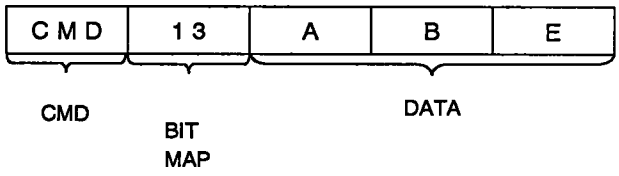
	MSB	LSB	
UB1	Lower Binary Group		Binary Code
UB2			Binary Code
UB3			Binary Code
UB4	Upper Binary Group		Binary Code

5-2. BIT MAP SYSTEM

Function can be extended by adding the two or more Mode Bit Map to a part of command blocks. In the bit map, necessary data corresponding to the designated bit is accessed. In the example below, data corresponding to bits 0, 1, and 4 is designated. For example, the data corresponding to the bit position in the BIT MAP data, can be designated.

(Example)

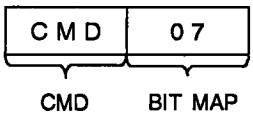
Command example



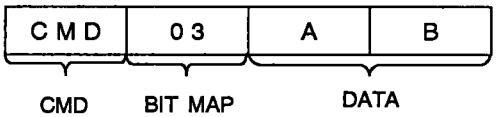
As the BIT MAP 13H is 0001 0011, the bits 0, 1, 4 are on. i.e.,
bit 0 designates DATA-A.
bit 1 designates DATA-B.
bit 4 designates DATA-E.

When an undefined bit is set and sensed at the bit map, it is cleared and returned.
Example) bit 0 specifies "DATA-A", bit-1 specifies "DATA-B", bit 2 is undefined

Request

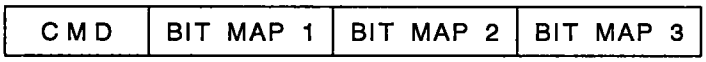


Return

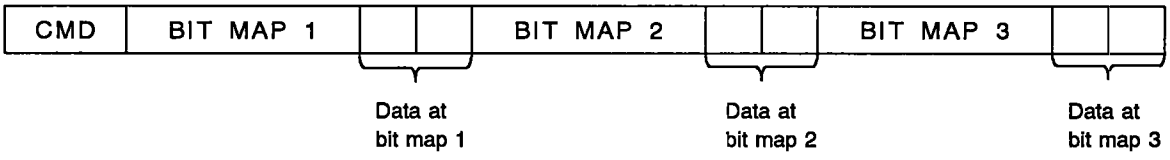


The command block can be extended by adding two or more bit maps. When three bit maps are added, the following command block is obtained :

Request



Return



6. MACRO INSTRUCTION

6-1. DEFINITION

A command called macro instruction is defined in this protocol. This command (1XH) differs from other commands.

1) When execution is not completed directly when an instruction is issued, the instruction is defined as a macro instruction.
The command is assigned to 1XH.

2) When a macro instruction is issued, a macro instruction number is assigned to the corresponding instruction data by the controller.
The macro instruction is managed by this macro instruction number.

3) When a corresponding macro command has been executed, the Flexicart sets the corresponding macro number and end information to the cart status's macro end information block.

4) Using the macro end information, the controller checks whether a macro command has been executed.

5) Macro instruction cannot be canceled during move macro command execution.

6) The Flexicart can store a maximum of 32 macro instructions.
When the macro instruction buffer is full, BUSY (FCH) is returned as the end information.
In this case, a new macro instruction is not accepted unless any of the macro instruction in the buffer completes its execution.

7) The macro number is defined with respect to each macro command. The macro number is indicated in BCD(*)code (valid from 00 through 99).

(*) BCD : Binary Coded Decimal

8) Macro instruction is canceled by sending macro number as follows.

Example :

Cancel the Cue up with DATA (Macro Number = 55, BT = 21H, CMD = 10H)

02	05	01		21	10	55	
STX	BC	UA1	UA2	BT	CMD	MACRO No	CS

6-2. TURN ON INSTRUCTION

Turn On commands are prepared for the Flexicart.
Turn On Time (BT=00H, CMD=02H), Extend Turn On (BT=00H, CMD=07H)

1) A designated command is executed at the designated time according to the Turn On instruction. When a command to be executed is issued at the designated time after a Turn On Time Preset instruction (BT=00H and CMD=02H) is sent, the time and command can be designated.

2) When a Turn On instruction is issued, a Turn On instruction number is assigned to the corresponding instruction data by the controller.
The controller and Flexicart are then managed by this turn on instruction number.

3) When a corresponding Turn On command is executed, the Flexicart sets the corresponding turn on number and end information to the cart status's Turn On end information block.

4) Using the end information, the controller checks whether a Turn On command has been executed.

5) The Turn On number is indicated in a BCD code (valid from 00 through 99).

6) The Flexicart can store a maximum of 64 Turn On instructions.

7) Turn On command is available except for the sense command.

8) The Turn On command can be canceled when a Turn On number is sent before execution start time.

Example)

① Cancel the "VTR PLAY (Turn On Number=77, BT=21H, CMD=21H)"

02	05	01		00	02 or 07	77	
STX	BC	UA1	UA2	BT	CMD	Turn On No	CS

(Cancel by Turn On Number)

② Cancel the "Turn On" for "Cue up with DATA (Turn On Number=77, Macro Number=55, BT=21H, CMD=10H)"

02	05	01		00	02 or 07	77	
STX	BC	UA1	UA2	BT	CMD	Turn On No	CS

(Cancel by Turn On Number)

or

02	05	01		21	10	55	
STX	BC	UA1	UA2	BT	CMD	MACRO No	CS

(Cancel by Macro Number)

7. COMMAND LIST

The abbreviation used in the Command List are shown below.

T. No.	:	Turn On No.
BM	:	Bit Map
CCSEL	:	Cassette Console Select
M. No.	:	Macro No.
VTRSEL	:	VTR Select
TCSEL	:	Time Code Select
UBBC	:	User Bit Block Count (Frame Count)
UBDB	:	User Bit Data Block
SWSEL	:	Switcher Select
CTL	:	Control

7-1. COMMAND LIST FOR FLEXICART SYSTEM

BT, CMD		Command Name	Format
00H, 00H	:	System Reset	BT+CMD
00H, 01H	:	Standard Time Preset	BT+CMD+TC
00H, 02H	:	Turn On Time	BT+CMD+T. No.+TC
00H, 03H	:	Standard Time Preset 2	BT+CMD+DATA(+TC)
00H, 05H	:	System Mode Preset	BT+CMD+CTL+BM [+ sym0] .. [+ sym7]
00H, 07H	:	Extended Turn On	BT+CMD+T.No.+MODE+DATA
00H, 08H	:	External Out Port Set	BT+CMD+PORT [+DATA String]
00H, 09H	:	Set VTR Control Mode	BT+CMD+DATA
00H, 0AH	:	On Air Tally	BT+CMD+DATA
00H, 50H	:	Dummy	BT+CMD
00H, 60H	:	Re-Request	BT+CMD
00H, 70H	:	Re-Request Return	BT+CMD
00H, 61H	:	Sense Cart Status	BT+CMD+BM1 [+ BM2]
00H, 71H	:	Sense Cart Status Return	BT+CMD+BM1 [+CSTS0] .. [+CSTS7] [+ BM2 [+CSTS8] .. [CSTS15]]
00H, 65H	:	Sense System Mode	BT+CMD+BM
00H, 75H	:	Sense System Mode Return	BT+CMD+BM [+ sym0] .. [sym7]
00H, 68H	:	Sense Ext. In-port	BT+CMD+PORT
00H, 78H	:	Sense Ext. In-port Return	BT+CMD+PORT+DATA_String
00H, 69H	:	Sense VTR Control Mode	BT+CMD
00H, 79H	:	VTR Control Mode Return	BT+CMD+DATA
00H, 6CH	:	Sense Cart Type	BT+CMD
00H, 7CH	:	Cart Type Return	BT+CMD+DATA
00H, 6DH	:	Sense Version Number	BT+CMD
00H, 7DH	:	Version Number Return	BT+CMD+DATA
00H, 6FH	:	Sense Error Report	BT+CMD
00H, 7FH	:	Error Report Return	BT+CMD+DATA

7-2. TRANSPORT CONTROL COMMAND

BT, CMD	Command Name	Format
01H, 00H	: System Reset	BT+CMD+CCSEL+DATA
01H, 09H	: Set Bin Lamp	BT+CMD+CCSEL+1stBIN No.+DATA_String
01H, 0BH	: Set Buzzer	BT+CMD+CCSEL+CTL
01H, 10H	: Cass. Move	BT+CMD+M. No.+SBIN+DBIN
01H, 14H	: Elevator Move	BT+CMD+M. No.+DBIN
01H, 1DH	: Elevator Initalize	BT+CMD+M. No.+CCSEL+CTL
01H, 61H	: Sense C.C. Status	BT+CMD+CCSEL+BM
01H, 71H	: C.C. Status Return	BT+CMD+CCSEL+BM [+CCSO] .. [+CCS7]
01H, 62H	: Sense Bin Status	BT+CMD+CCSEL+BIN No.+BM
01H, 72H	: Bin Status Return	BT+CMD+CCSEL+BIN No. +BM [+BSTSO] .. [+BSTS7]
01H, 63H	: Sense C.C. Error Code	BT+CMD+CCSEL+BM
01H, 73H	: C.C. Error Code Return	BT+CMD+CCSEL+BM_DATA_String
01H, 6FH	: Sense Consol Config.	BT+CMD+CCSEL
01H, 7FH	: C.C. Config Return	BT+CMD +CCSEL [+con. cnfg0] .. [+con. cnfg7]

7-3. VTR CONTROL COMMAND

BT, CMD	Command Name	Format
21H, 02H :	Timer Mode Select	BT+CMD+VTRSEL+DATA
21H, 03H :	TCG Preset	BT+CMD+VTRSEL+TC
21H, 04H :	CTL Preset	BT+CMD+VTRSEL+TC
21H, 05H :	UB Preset	BT+CMD+VTRSEL+UB
21H, 06H :	Field Lock Select	BT+CMD+VTRSEL+DATA
21H, 0DH :	Lost Lock Reset	BT+CMD+VTRSEL
21H, 10H :	Cue Up with Data	BT+CMD+M. No.+VTRSEL+ TC
21H, 11H :	Sync Play	BT+CMD+M. No.+VTRSEL+SPEED+TC1+TC2
21H, 12H :	REW & Eject	BT+CMD+M. No.+VTRSEL+ TC
21H, 13H :	Cue up without TC	BT+CMD+M. No.+VTRSEL+ TC
21H, 15H :	Normal REC with TC	BT+CMD+M. No.+VTRSEL+TC1+TC2
21H, 16H :	Auto Edit	BT+CMD+M. No.+VTRSEL+E. mode +TC1+TC2+TC3
21H, 1AH :	Read UB Block	BT+CMD+M. No.+VTRSEL+TCSEL+TC1+TC2
21H, 1BH :	Write UB Block	BT+CMD+M. No.+VTRSEL+TCSEL+TC+UBBC [+ UBDB1] .. [UBDBN]
21H, 1CH :	Clear UB Block	BT+CMD+M. No.+VTRSEL
21H, 20H :	Stop	BT+CMD+VTRSEL
21H, 21H :	Play	BT+CMD+VTRSEL
21H, 22H :	Record	BT+CMD+VTRSEL
21H, 23H :	Eject	BT+CMD+VTRSEL
21H, 24H :	FF	BT+CMD+VTRSEL
21H, 25H :	REW	BT+CMD+VTRSEL
21H, 26H :	JOG(F)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 27H :	JOG(R)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 28H :	VAR(F)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 29H :	VAR(R)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 2AH :	SHTL(F)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 2BH :	SHTL(R)	BT+CMD+VTRSEL+DATA1 [+ DATA2]
21H, 40H :	STD'BY On/Off	BT+CMD+VTRSEL+DATA
21H, 41H :	Tension On/Off	BT+CMD+VTRSEL+DATA
21H, 42H :	Anti Clog Timer On/Off	BT+CMD+VTRSEL+DATA
21H, 44H :	Edit On/Off	BT+CMD+VTRSEL+DATA
21H, 45H :	Edit Preset	BT+CMD+VTRSEL+DATA
21H, 48H :	Local Enable/Disable	BT+CMD+VTRSEL+DATA
21H, 4AH :	TCG Run/Hold	BT+CMD+VTRSEL+DATA
21H, 4BH :	Freeze On/Off	BT+CMD+VTRSEL+DATA
21H, 4FH :	VITC On/Off	BT+CMD+VTRSEL+DATA

21H, 5FH	:	VTR Through Command	BT+CMD+VTRSEL+DATA
21H, 60H	:	Sense VTR Status	BT+CMD+VTRSEL+BM
21H, 70H	:	VTR Status Return	BT+CMD+VTRSEL+BM [+VSTS0]..[VSTS07]
21H, 61H	:	Sense Expanded VTR Status	BT+CMD+VTRSEL+BM
21H, 71H	:	Expanded VTR Status Return	BT+CMD+VTRSEL+BM [+EVSTS0]..[EVSTS7]
21H, 6AH	:	Sense UBB Data	BT+CMD+VTRSEL+UBBC
21H, 7AH	:	UBDB Data Return	BT+CMD+VTRSEL+UBBC+UBDB

7-4. SWITCHER CONTROL COMMAND

BT, CMD		Command Name	Format
31H, 05H	:	Set System Control Mode	BT+CMD+SWSEL+BM+DATA
31H, 20H	:	Cross Point Select	BT+CMD+SWSEL+DATA1+DATA2 ...
31H, 21H	:	Monitor Select	BT+CMD+SWSEL+DATA
31H, 61H	:	Sense Cross Point Status	BT+CMD+SWSEL+BM
31H, 71H	:	Cross Point Status Return	BT+CMD+SWSEL+BM [+ SSLO]..[+ SSL7]
31H, 64H	:	Sense Switcher Status	BT+CMD+SWSEL+BM
31H, 74H	:	Switcher Status Return	BT+CMD+SWSEL+BM [+ SSTO]..[+ SST7]

8. DETAILED DESCRIPTION OF COMMANDS

The detailed information for each BT are described in this section.

The number used in the data configuration frame for command explanation is written in hexadecimal digit.

8-1. LIST OF COMMANDS TO THE FLEXICART SYSTEM (BT=00H)

8-1-1. Command Table

This block defines the command to be issued to the cart system.

This command block format is shown below.

Command Block = CMD+DATA

Command list when BT=00H.

	Set & Reset						Sense	Return
High / Low	0	1	2	3	4	5	6	7
0	System Reset					Dummy	Re-request	←
1	Standard Time						Cart Status	←
2	Turn On Time							
3	Standard Time 2							
4								
5	System Mode						System Mode	←
6								
7	Extended Turn On							
8	External Out Port Set						External Input port	←
9	Set Control Mode						Sense Control Mode	←
A	On Air Tally							
B								
C								
D							Version Number	←
E								
F							Sense Error Report	Error Report Return

8-1-2. Command Description

Name : System Reset

BT : 00H

Command : 00H

Function : Executes the following :

1. Internal macro commands and Turn On commands are all cleared. However, a macro command that is under execution is not canceled and kept executed.
2. The end information of an internal macro command and Turn On command are cleared. Even if the macro command execution is completed after clearing, end information is not returned to the controller.
3. The information on the all bins is reported to the controller using the cart status (CSTS3).

Data configuration :

02	04	01		00	00	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. ACK (04H)
2. NAK (05H)

Note : "BT=01H, CMD=00H" is used only for executing "3" described above.

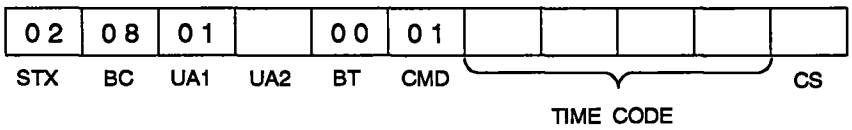
Name : Standard Time Preset

BT : 00H

Command : 01H

Function : Sets the standard time used for the reference timer of the Turn On Time command. This command works as same as the "standard Time Preset 2 (Mode : 02H)".

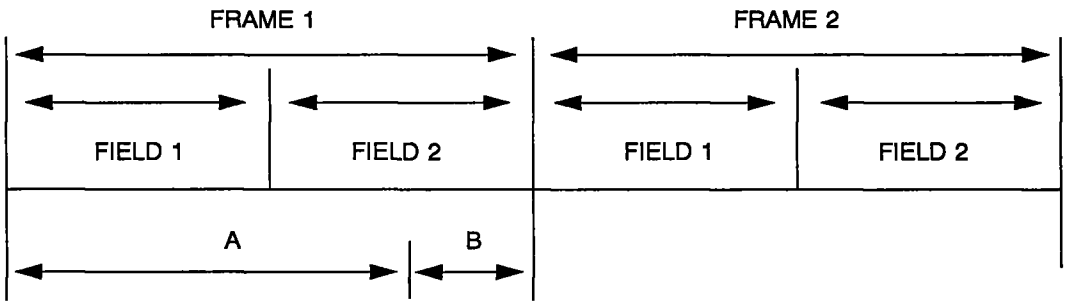
Data configuration :



Return :

1. ACK (04H)
2. NAK (05H)

Timing :



When the Standard Time Preset command is received in area A, the standard time is specified by this command starts at the top of the first field in frame 2.
Area B indicates a time used for command analysis that is minimum of 5 msec.

Remarks : When the system preset mode is set to NTSC/DF, and if 00 : 01 : 00 : 00 is sent, it is set to 00 : 01 : 00 : 02 in Flexicart.

Name : Turn On Time

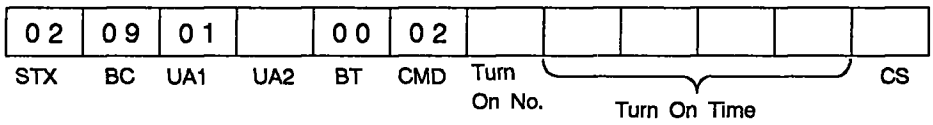
BT : 00H

Command : 02H

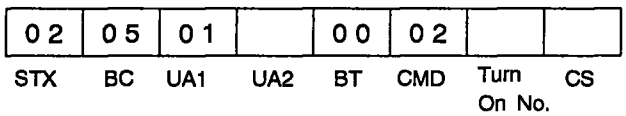
Function : Sets the command execution time (Turn On Time). The command which is received continuously in response to the Turn On Time command is executed in the same way that command is received at the command execution time. Therefore, the delayed communication between the cart and controlled device need not be considered at the controller. However, each command should be issued more than five frames before the execution time.

Data configuration :

1. Preset



2. Cancel



Remarks :

1. If DF (Drop Frame)-MODE is selected (System Preset Command), specified time may be changed. The following is its example.
   00 : 01 : 00 : 00 is changed to 00 : 01 : 00 : 02.
2. The Turn On Time's reference timer is the Standard Time.
3. This command becomes valid for the commands that follow.
4. The Flexicart can manage maximum of 64 Turn On Time buffers.
5. When the command next to Turn On time is the macro command, it can be canceled using the Macro No. or Turn On No. instruction.
6. Turn On command is not valid for the sense command.
7. If the time that is specified by Turn On Time has passed and one hour has not elapsed yet, the specified command is executed immediately and its end information is "F1H".
8. Turn On No. is shared with that of "Extended Turn On (07H)".
9. End information is stored in the CSTS2 of the Status Return (71H).

Return :

1. ACK (04H)
2. NAK (05H)

Name : Standard Time Preset 2

BT : 00H

Command : 03H

Function : Sets the internal standard timer to the designated mode.

Data configuration :

Mode 00 or 01

02	05	01		00	03	00 or 01	CS
STX	BCF	UA1	UA2	BT	CMD	Mode	

Mode 02

02	09	01		00	03	02	FF	SS	MM	HH	CS
STX	BC	UA1	UA2	BT	CMD	MODE	TIME DATA				

(*1) Mode 00 : Locked to the Time code input to the Flexicart.
01 : Locked at first to the Time code input to the Flexicart then self-advanced.
02 : Locked to the designated Time data, then self-advanced.

Note) This command works same as "Standard Time Preset (01H)".

Return :

1. ACK (04H)
2. NAK (05H)

Name : System Mode Preset

BT : 00H

Command : 05H

Function : Sets the Flexicart's system operation mode.

Data configuration :

1. Preset

02		01		00	05	00			02
STX	BC	UA1	UA2	BT	CMD	Control	BIT MAP (*1)	System Mode MAP DATA (*2)	CS

(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
0	0	SYM 5	SYM 4	SYM 3	SYM 2	SYM 1	SYM 0

(*2) System Mode

BIT CMD	7	6	5	4	3	2	1	0	
SYM 0	Reserved								
SYM 1	Reserved								
SYM 2	TV Standard (*3)		Reserved			Field Lock Select (*6)		DF-ON (*4)	
SYM 3	Reserved								
SYM 4	Barcode Type (*5) (Read only area)								
SYM 5			VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1	(*7)
SYM 7	Reserved (Read only area)								

(*3)

bit 7	bit 6	TV Standard
0	0	NTSC
0	1	PAL
1	0	SECAM
1	1	Reserved

The default value is based on DIP Swicth of CPU-107 board

(*4) Specify the drop frame on/off of the time code.
The drop frame default value is as follows ;
NTSC : DF-ON = 1 (Drop frame mode)
Others : DF-ON = 0 (Non-drop frame mode)

(*5) 01H (Fixed) : Flexicart

(*6) Field Lock Select

bit 7	bit 6	NTSC/SECAM	PAL	
0	0	2 Field	2 Field	(default)
0	1	2 Field	4 Field	
1	0	4 Field	8 Field	
1	1	Reserved	Reserved	

(*7) Internal VTR Configuration
Set bit to "1" corresponding to VTR

Return :

1. ACK (04H)
2. NAK (05H)

Name : Extended Turn On

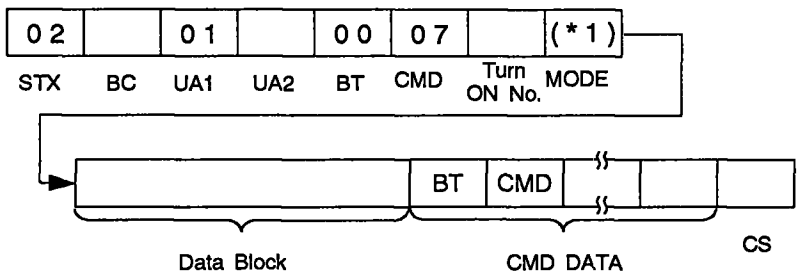
BT : 00H

Command : 07H

Function : Sets the execution condition (Turn on condition).
The command which is Specified in "CMD DATA" is executed when the conditions specified in the mode and data block are satisfied.
Execution time is reported in the end information to the controller.
However, the command should be issued more than five frames before the execution time.

Data configuration :

1. Preset



a. (*1) Mode = 00H (External Trigger Pulse Mode)

Data Block is as follows :

(*2) PIN No. 10 ~ 17 (0AH ~ 11H)
26 ~ 33 (1AH ~ 21H)
42 ~ 49 (2AH ~ 31H)

(*3) 00H : LOW level
01H : HIGH level

(*4) OPTION
Executes the command immediately if "FFH" is set in the frame area.

b. (*1) Mode = 01H (Time execution Mode)

Data Block is as follows :

FF	SS	MM	HH

execution time (FF : SS : MM : HH)
(*5)

BCD Data

(*5) OPTION

Executes the command immediately if "FFH" is set in the frame area.

2. Cancel

02		01		00	07		
STX	BC	UA1	UA2	BT	CMD	Turn On No.	CS

Remarks : When the system preset mode is set to NTSC/DF, and if 00 : 01 : 00 : 00 is sent, it is set to 00 : 01 : 00 : 02 in Flexicart.

Return :

1. ACK (04H)
2. NAK (05H)

End Information : End information is set in CSTS13 of "Cart Status Return (71H)" as follows :

CSTS 13	Turn On No.
	End Information
	FF
	SS
	MM
	HH

Execution time

Remarks :

1. The Extended Turn On reference timer is the Standard Time.
2. The Flexicart can manage maximum of 64 Turn On Time.
3. When the command specified in the Extended Turn On is the macro command, it can be canceled using the Macro No. or Turn On No. instruction.
4. Turn On command is not applied to the sense command.

5. If the time that is specified by Turn On Time has passed and one hour has not elapsed yet, the specified command is executed immediately and its end information is "F1H".
6. The execution time set to the end information is FF : FF : FF : FF when it is cancelled.
7. Turn On No. is shared with that of "Turn On Time (02H)".

Name : External Output Port Set

BT : 00H

Command : 08H

Function : Sets the output parallel port attached to the Flexicart.

Data configuration :

1. Set

02	07	01		00	08	00	(*1)		
STX	BC	UA1	UA2	BT	CMD	Control	PORT No.	DATA	CS

2. Reset

02	07	01		00	08	01	(*1)		
STX	BC	UA1	UA2	BT	CMD	Control	PORT No.	DATA	CS

To activate the output port, set the desired bit to "1" and set the "Control" flag to 00H.
To deactivate the output port, set the desired bit to "1" and set the "Control" flag to 01H.

(*1) : Port number and data are described below. (ACTIVE-Low)

Port No.	DATA
01 H	MSB 7 6 5 4 3 2 1 0 PIN 5 (outport 8) PIN 21 (outport 7) PIN 37 (outport 6) PIN 4 (outport 5) PIN 20 (outport 4) PIN 36 (outport 3) PIN 3 (outport 2) PIN 19 (outport 1)
02 H	MSB 7 6 5 4 3 2 1 0 PIN 24 (outport 16) PIN 40 (outport 15) PIN 7 (outport 14) PIN 23 (outport 13) PIN 39 (outport 12) PIN 6 (outport 11) PIN 22 (outport 10) PIN 38 (outport 9)
03 H	MSB 7 6 5 4 3 2 1 0 PIN 9 (outport 20) PIN 25 (outport 19) PIN 41 (outport 18) PIN 8 (outport 17)

Return :

1. ACK (04H)
2. NAK (05H)

Name : Set VTR Control Mode

BT : 00H

Command : 09H

Function : Select that VTR is controlled either from IF-373 or from external controller.

Data Configuration :

02	05	01		01	09		
STX	BC	UA1	UA2	BT	CMD	Data	CS

Data

b7	b6	b5	b4	b3	b2	b1	b0
0	0	VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1

0 : Internal Control (Default)

1 : External Control

Name : On Air Tally

BT : 00H

Command : 0AH

Function : Sets or resets Tally Lamp indicating ON AIR of Flexicart.

Data Configuration :

1. Set the Tally Lamp : control = 00H

							(*1)	
02	06	01		00	0A	00	80	
STX	BC	UA1	UA2	BT	CMD	Control	DATA	CS

2. Reset the Tally Lamp : control = 01H

							(*1)	
02	06	01		00	0A	01	80	
STX	BC	UA1	UA2	BT	CMD	Control	DATA	CS

(*1) DATA : 80H (Fixed)

Return :

1. ACK (04H)
2. NAK (05H)

Name : Dummy

BT : 00H

Command : 50H

Function : do nothing

Data configuration :

02	04	01		00	50	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. ACK (04H)
2. NAK (05H)

Remarks :

This command is used for communication check between the cart and the controller.

Name : Re-Request

BT : 00H

Command : 60H

Function : The Flexicart returns the Sense Return that was sent previously to a communication line. This command will be used to regenerate the status information that was once lost due to communication line error.

Data configuration :

02	04	01		00	60	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. Sense Return
2. Re-Request Return (70H)
3. NAK (05H)

Name : Re-Request Return

BT : 00H

Command : 70H

Function : When there is not return data upon receiving the Re-Request command, this Re-Request command is sent to the controller.

Data configuration :

02	04	01		00	70	
STX	BC	UA1	UA2	BT	CMD	CS

Request :

1. Re-Request (60H)

Name : Sense Cart Status

BT : 00H

Command : 61H

Function : Requests the Flexicart's status.
The requested data can be designated using a bit map. The controller can get the macro end information, changed Bin No. or the other informations.

Data configuration :

02	06	01		00	61	(*1)	(*2)	
STX	BC	UA1	UA2	BT	CMD	BIT MAP1	BIT MAP2	CS

(*1) BIT MAP 1

b7	b6	b5	b4	b3	b2	b1	b0
CSTS7	CSTS6	CSTS5	CSTS4	CSTS3	CSTS2	CSTS1	CSTS0

(*2) BIT MAP 2

b7	b6	b5	b4	b3	b2	b1	b0
CSTS15	CSTS14	CSTS13	CSTS12	CSTS11	CSTS10	CSTS9	CSTS8

※ BIT MAP 2 can be omitted.

Return :

1. Cart Status Return (71H)
2. NAK (05H)

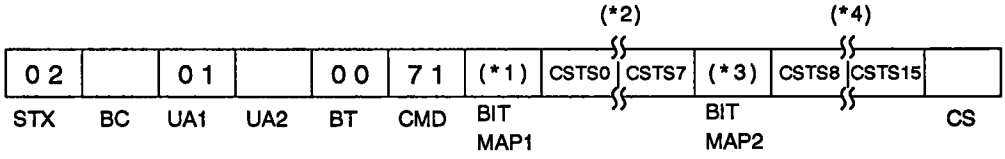
Name : Cart Status Return

BT : 00H

Command : 71H

Function : Returns the Flexicart's status.

Data configuration :



(*1) Same as bit map 1 in 61H.

(*2) Refer to the Cart Status MAP.

(*3) Same as bit map 2 in 61H.

(*4) Refer to the Cart Status MAP.

Request :

1. Sense Cart Status (61H)

Cart Status MAP :

STATUS \ BIT		7	6	5	4	3	2	1	0
CSTS 0 (Failure Status)			TEST (*14)		REF Missing	LTC Missing			
						Power Down (*15)			
CSTS 1 Macro END Information	Macro Number	(*7)							
	End Information	(*10)							
	Remaining Data								
CSTS 2 Turn ON END Information	Turn On Number	(*7)							
	End Information	(*13)							
	Remaining Data								
CSTS 3 Changed BIN Number	C.C	01 (Fixed)							
	Bin Number (*1) (*5)	1000's digit				100's digit			
		10's digit				1's digit			
CSTS 4 Changed CC Status		0	0	0	CC1 (*11)	0	0	0	CC1 (*4) (*8)
CSTS 5 Changed VTR Status	V.C	01 (Fixed)							
	VTR Number (*2) (*4)	0	0	VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1
CSTS 6 U/B Block Count	V.C	01 (Fixed)							
	VTR Number (*6)	0	0	VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1
CSTS 7		Reserved							

STATUS \ BIT	7	6	5	4	3	2	1	0
CSTS 8 System Mode Change (*4)	SYM 7	SYM 6	SYM 5	SYM 4	SYM 3	SYM 2	SYM 1	SYM 0
CSTS 9	Reserved (1Byte)							
CSTS 10	Reserved (2Byte)							
CSTS 11 Changed Sw'er Status (*4)	A3 CH2	A3 CH1	A2 CH2	A2 CH1	A1 (CH2)	A1 (CH1)	V2	V1
CSTS 12 (*4)(*9) Changed Exp. VTR Status — V.C	01							
CSTS 12 (*4)(*9) Changed Exp. VTR Status — VTR Number	0	0	VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1
CSTS 13 Extend Turn ON End Information — Turn On Number	(*7)							
CSTS 13 Extend Turn ON End Information — End Information	(*13)							
CSTS 13 Extend Turn ON End Information — Exec Time	FF							
	SS							
	MM							
	HH							
CSTS 14 Changed Ext. INPUT (*12)	Changed							
	42	26	10	43	27	11	44	28
	12	45	29	13	46	30	14	47
					31	15	48	32
CSTS 15 (Error Report) (*3)								

(*1) In the normal situation :

Report the Changed Bin Number stored in the BSTS0 of the Bin Status.

In the following situation ;

After the power on

Receiving "BT=00H, CMD=00H" command

Receiving "BT=01H, CMD=00H" command

All bin status are reported.

(*2) If VTR status is changed, corresponding bit is set.
This status is valid only for VST 0.

(*3) When error is occurred in the data stream, 01H is set.
If Sense Error Report (BT=00H, CMD=6FH) is issued and its information is sensed, it is cleared.

(*4) If the corresponding status is sensed, this status is cleared.
Example :
When Changed VTR Status (CSTS 5, VTR 2) is set,
if VTR 2 status is sensed by Sense VTR Status (BT=21H, CMD=60H), this bit is cleared.

(*5) All go to zero when there is no change in bin status.

(*6) Changed UB Block Cout is valid only for VST 1.

(*7) Each data becomes FFH when there is no Macro number executed nor Turn On number executed.

(*8) When Cassette Console status is changed, the corresponding bit is set.

(*9) This bit is set under the conditions below ;
1. When the alarm bit in the Expanded VTR Status (EVSTS 0) is changed.
2. When the REC error level or PB error level in the expanded VTR status (EVSTS 0) is changed.

(*10) Refer to APPENDIX "Macro End Information"

(*11) Error information is stored in console, when this bit goes to 1.
Detailed information is requested to execute the "Cassette Console Error Sense" command. (BT=01H, CMD=73H)

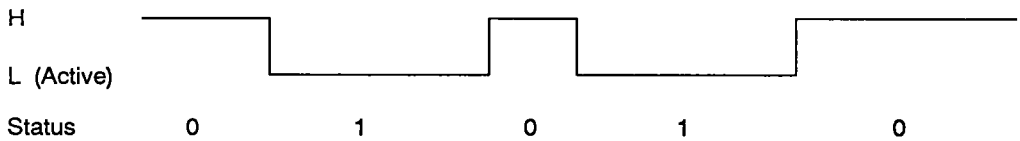
(*12) 1. This area buffers changed status of EXT INPUT port up to 512.
Each bit is corresponding to EXT INPUT port.
The number on the map is actual number.

2. The first byte is BITMAP. If status is changed, the corresponding bit is set.
BIT 7 to BIT 3 are always "0". (Fixed)

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	0	0	0	0	4th Byte	3rd Byte	2nd Byte

When BITMAP is "0", the port data indicates the current signal status.

3. If EXT INPUT level is low, the corresponding bit is "1".
If EXT INPUT level is high, the corresponding bit is "0".



4. Pulse width must be over 1 frame length. Shorter pulse is ignored.
5. Flexicart stores up to 512 signal status.
If status is overflowed, only 512th data is updated.

(*13) Refer to the Appendix "Turn On End Information"

(*14) This bit is set in the TEST mode.

(*15) This bit is set after power on or reset.
This bit is cleared once sensed.

Name : Sense System Mode

BT : 00H

Command : 65H

Function : Requests the "System mode" status

Data configuration :

02	05	01		00	65	(*1)	
STX	BC	UA1	UA2	BT	CMD	BIT MAP	CS

(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
SYM 7	SYM 6	SYM 5	SYM 4	SYM 3	SYM 2	SYM 1	SYM 0

Return :

1. System Mode Return (75H)
2. NAK (05H)

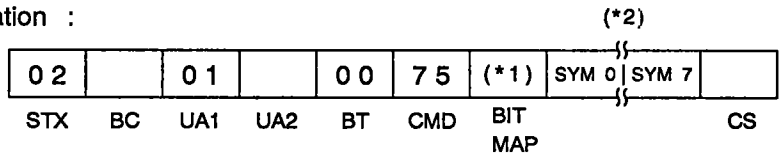
Name : System Mode Return

BT : 00H

Command : 75H

Function : Returns the "System Mode".

Data configuration :



(*1) Same as the bit map in the command 65H.

(*2) Refer to the System Mode Map.

Remarks : When SYM7 is sensed in field 2, the difference between the current standard time and sensed value should be within ± 0 frame.

Request :

1. Sense System Mode (65H)

System Mode Map :

STATUS \ BIT	7	6	5	4	3	2	1	0
SYM 0	Reserved							
SYM 1	Reserved							
SYM 2	TV Standard (*1)		Reserved			Field Lock (*4)		DF-ON
SYM 3	Reserved							
SYM 4	(*2) Barcode Type							
SYM 5	Internal VTR Configuration							
SYM 7	(*3) Standard Time (Current Time : 4 bytes)							

(*1) :

bit 7	bit 6	TV Standard
0	0	NTSC
0	1	PAL
1	0	SECAM
1	1	Reserved

(*2) : Barcode Type
01H (Fixed : Flexicart)

(*3) :

1st byte		2nd byte		3rd byte		4th byte	
F ×10	F ×1	S ×10	S ×1	M ×10	M ×1	H ×10	H ×1

(*4) : Field Lock settings are show.

bit 7	bit 6	NTSC/SECAM	PAL
0	0	2 Field	2 Field
0	1	2 Field	4 Field
1	0	4 Field	8 Field
1	1	Reserved	Reserved

Name : Sense External Input Port

BT : 00H

Command : 68H

Function : Senses the status of the Input Parallel Port of the Flexicart.

Data configuration :

02	05	01		00	68	(*1)	
STX	BC	UA1	UA2	BT	CMD	PORT No.	CS

(*1) : Refer to the "External Input Port Return (78H)" about port number definition.

Return :

1. External Input Port Return (78H)
2. NAK (05H)

Name : External Input Port Return

BT : 00H

Command : 78H

Function : Returns the status of the External Input Port of the Flexicart.

Data configuration :

						(*1)		
02	06	01		00	78			
STX	BC	UA1	UA2	BT	CMD	PORT No.	DATA	CS

(*1) The relation between the port number and data is shown in the table below.

Port No.	DATA
01 H	MSB 7 6 5 4 3 2 1 0 PIN 28 (outport 8) PIN 44 (outport 7) PIN 11 (outport 6) PIN 27 (outport 5) PIN 43 (outport 4) PIN 10 (outport 3) PIN 26 (outport 2) PIN 42 (outport 1)
02 H	MSB 7 6 5 4 3 2 1 0 PIN 47 (outport 16) PIN 14 (outport 15) PIN 30 (outport 14) PIN 46 (outport 13) PIN 13 (outport 12) PIN 29 (outport 11) PIN 45 (outport 10) PIN 12 (outport 9)
03 H	MSB 7 6 5 4 3 2 1 0 PIN 32 (outport 20) PIN 48 (outport 19) PIN 15 (outport 18) PIN 31 (outport 17)

Return :

1. Sense External Input Port (68H)

Name : Sense VTR Control Mode

BT : 00H

Command : 69H

Function : Sense that the VTR is controlled either from IF-373 or from external controller.

Data configuration :

02	04	01		01	69	
STX	BC	UA1	UA2	BT	CMD	CS

Name : VTR Control Mode Return

BT : 00H

Command : 79H

Function : Notifies that the VTR is controlled either from IF-373 or from external source.

Data configuration :

02	05	01		01	79		
STX	BC	UA1	UA2	BT	CMD	DATA	CS

DATA

b7	b6	b5	b4	b3	b2	b1	b0
0	0	VTR 6	VTR 5	VTR 4	VTR 3	VTR 2	VTR 1

0 : Internal Control (Default)
1 : External Control

Return :

1. Sense VTR Control Mode (69H)

Name : Sense Cart Type

BT : 00H

Command : 6CH

Function : Sense the cart type

Data Configuration :

02	04	01		00	6C	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. Cart Type Return (7CH)
2. NAK (05H)

Name : Cart Type Return

BT : 00H

Command : 7CH

Fucntion : Returns the cart type

Data Configuration :

02	06	01		00	7C	00	08	
STX	BC	UA1	UA2	BT	CMD	CART TYPE (00H, 08H Fixed)		CS

Request :

1. Sense Cart Type (6CH)

Name : Sense Version Number

BT : 00H

Command : 6DH

Function : Checks the version number of each mounted circuit board in Flexicart.

Data Configuration :

02	04	01		00	6D	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. Version Number Return (7DH)
2. NAK (05H)

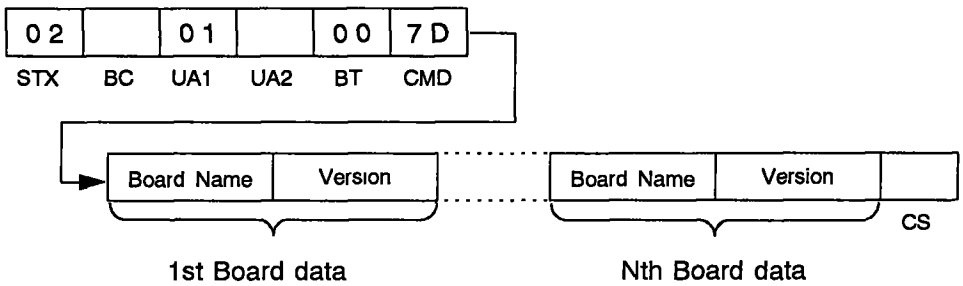
Name : Version Number Return

BT : 00H

Command : 7DH

Fucntion : Returns the version information of each mounted circuit board of Flexicart.

Data Configuration :



Remark : Board name and Version data are returned in ASCII code.
Board name and Version data have both 8 byte fixed length.

Request :

1. Sense Version Number (6DH)

Name : Sense Error Report

BT : 00H

Command : 6FH

Function : Senses the command message that caused the error when data error has occurred.

Data Configuration :

02	04	01		00	6F	
STX	BC	UA1	UA2	BT	CMD	CS

Return :

1. Error Report Return (7FH)
2. NAK (05H)

Name : Error Report Return

BT : 00H

Command : 7FH

Function : Returns the command block that has caused error.

Data Configuration :

02		01			7F					
STX	BC	UA1	UA2	BT	CMD	BT				CS
						CMD block				

The command block that has caused error (*1)

(*1) Returns the "BT+ command block" of the data that causes error.
IF there is not a error data, BT is set to FFH and CMD block is omitted.
Total data length are limited to 256 bytes. So latter data of the command block beyond 256 bytes are omitted.

Request :

1. Sense Error Report (6FH)

8-2. DETAILS OF CART TRANSPORT COMMAND

8-2-1. Command Table

This command block defines the commands (BT=01H) which are issued for cart transport.
The command block format is as follows.

Command Block = CMD+DATA

The Flexicart bin number is specified as follows.

	S_Cassette (Left)	(L/M- Cassette)	S_Cassette (Right)
Upper BIN Unit	1001	(6001)	1101
	1002	(6002)	1102
	1003	(6003)	1103
	⋮	⋮	⋮
Lower BIN Unit	10 nn	(60 nn)	11 nn
VTR 1	0101		
VTR 2	0102		
VTR 3	0103		
VTR 4	0104		
VTR 5	0105		
VTR 6	0106		
Elevator	0001		

Note) A BIN unit of Flexicart can handle two S-size cassettes per one unit side by side.

Example) If the operator inserts a S-size cassette into the left side of top most bin unit, Flexicart sets 1001 as the Changed Bin number (CSTS3) of the Flexicart status.
If the operator inserts a S-size cassette into the right side of top most bin unit, Flexicart sets 1101 as the Changed Bin number (CSTS3) of Flexicart status.
If the operator inserts L/M-size cassette into the top most bin unit, Flexicart sets 6001 as the Changed Bin number (CSTS3) of Flexicart status.

Command List When BT=01H

	Preset	Macro					Sense	Return
High / Low	0	1	2	3	4	5	6	7
0	System Reset	Cassette Move						
1							Cassette Console Status	←
2							Bin Status	←
3							Error Code Status	←
4		Elevator Move						
5								
6								
7								
8								
9	Set Bin Lamp							
A								
B	Set Buzzer							
C								
D		Elevator Initialize						
E								
F							Console Cofiguration	←

8-2-2. Command Description

Name : System Reset

BT : 01H

Command : 00H

Function : Reports bin data of cassette console

Data Configuration :

							(*1)	
02	06	01		01	00	01	01	
STX	BC	UA1	UA2	BT	CMD	C.C Select	DATA	CS

DATA (*1) : 01 The command to report the bin data of the cassette console.
Reports the all Bin status by "Changed Bin Number" (CSTS3)

Return :

1. ACK (04H)
2. NAK (05H)

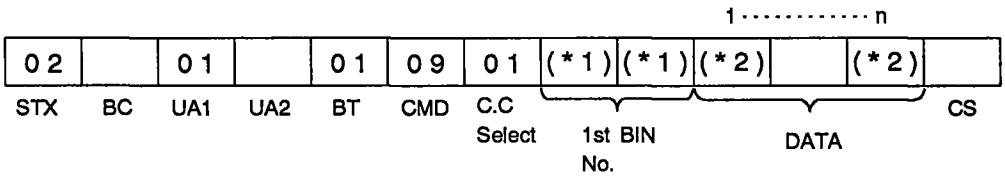
Name : Set BIN Lamp

BT : 01H

Command : 09H

Function : Controls the bin lamp.
Controls the bin lamps stating from the bin number specified by the first bin number, and incrementing the amount of bins which are equal to the number of bytes in the data, until the DATAn.
The data's first byte is used to control the bin lamp specified by the first bin number. The lamp is controlled in sequence.

Data configuration :



(*1) BCD Code

(*2) DATA 00 : Goes off
01 : Lights
02 : Reserved
03 : Blinks
FF : Unchanged

Return :

1. ACK (04H)
2. NAK (05H)

Name : Set Buzzer

BT : 01H

Command : 0BH

Function : Sets the internal buzzer of Flexicart.

Data configuration :

02	06	01		01	0B	01	(*1)	
STX	BC	UA1	UA2	BT	CMD	C.C Select	Control	CS

(*1) The control code and function are shown below.

01 : OFF

02 : One Shot (-)

n3 : Intermittent sound 1 (----) * n indicates the number of sounds. (Infinite for 0.)

ON : Approx. 45 msec.

OFF : Approx. 45 msec.

n4 : Intermittent sound 2 (----) * n indicates the number of sounds. (Infinite for 0.)

ON : Approx. 45 msec.

OFF : Approx. 230 msec.

nF : Continuous sound n/10 Sec (Continuous when n is 0.)

Return :

1. ACK (04H)
2. NAK (05H)

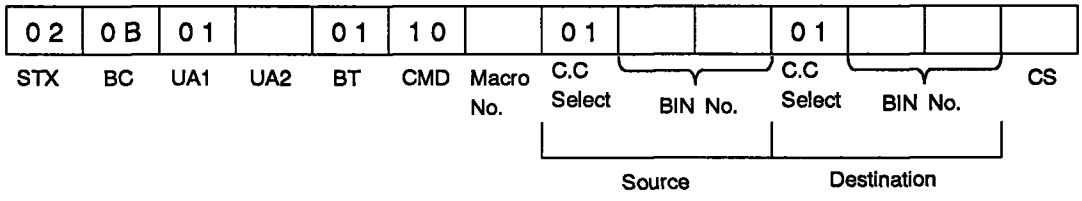
Name : Cassette Move

BT : 01H

Command : 10H

Function : Moves a cassette from the designated source number to the destination number.

Data configuration :



Return :

1. ACK (04H)
2. NAK (05H)

End information : 00H ; Normal End ····· When the move instruction is executed normally. When VTR is the destination, this status is issued at the cassette-in timing. For end information other than the above, refer to the Macro End Information in Appendix.

Name : Elevator Move

BT : 01H

Command : 14H

Function : Moves the elevator to the position designated by the destination bin number.

Data configuration :

02	08	01		01	14		01			
STX	BC	UA1	UA2	BT	CMD	Macro No.	C.C Select	Destination BIN No.		CS

Return :

1. ACK (04H)
2. NAK (05H)

End information : The end information is reported in the CSTS1 of "BT=00H, CMD=71H".
00H : Normal End ····· More instruction is executed correctly.
Refer to the "Macro End Information "in Appendix other than the above.

Remarks :

1. This command is only used to move an elevator.
2. The elevator is controlled automatically in each command.
   So, this command is used mainly for elevator testing.

Name : Elevator Initialize

BT : 01H

Command : 1DH

Function : Initializes the elevator (X-axis, Z-axis, hand) and initializes the Y-axis.
Read BIN and VTR positions.
(This command works as same as the INITIAL key on the display panel.)

Data configuration :

02	07	01		01	1D		01	(*2)	
STX	BC	UA1	UA2	BT	CMD	Macro No.	C.C Select	Control Word	CS

(*1) 00 : The reference positions of all bins and VTRs are read.

Return :

1. ACK (04H)
2. NAK (05H)

Remarks :

The end information is reported in the CSTS1 of "BT=00H, CMD=71H".
Refer to the "Macro End Information" in Appendix.

Name : Sense Cassette Console Status

BT : 01H

Command : 61H

Function : Requests the block status controlled by the Flexicart.
The Requested data can be designated using a bit map.

Data configuration :

02	06	01		01	61	01	(*1)	
STX	BC	UA1	UA2	BT	CMD	C.C Select	BIT MAP	CS

(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
CCS 7	CCS 6	CCS 5	CCS 4	CCS 3	CCS 2	CCS 1	CCS 0

Return :

1. Cassette Console Status Return (71H)
2. NAK (05H)

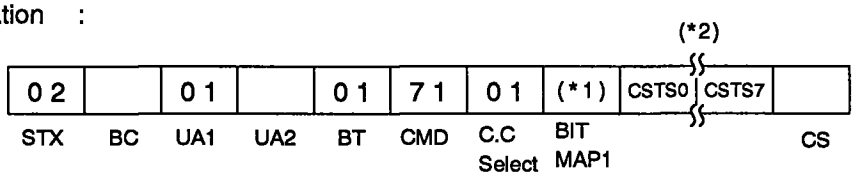
Name : Cassette Console Status Return

BT : 01H

Command : 71H

Function : Returns the Cassette Console Status.

Data configuration :



(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
CCS 7	CCS 6	CCS 5	CCS 4	CCS 3	CCS 2	CCS 1	CCS 0

(*2) Cassette Console Status MAP

BIT Status	7	6	5	4	3	2	1	0
CCS 0	Initial Request		No Commnication	Recover Request		Recovering	Initializing	
							Door Opening (*1)	Door Open

* CCS1 to CCS7 are undefined

(*1) Set to "1" during the action for door opening.

Request :

1. Cassette Console Status (61H)

Name : Sense BIN Status

BT : 01H

Command : 62H

Function : Requests the bin status.
The requested data can be designated using a bit map.

Data configuration :

02	08	01		01	62	01			(*1)	
STX	BC	UA1	UA2	BT	CMD	C.C Select	BIN No.		BIT MAP	CS

(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
BSTS 7	BSTS 6	BSTS 5	BSTS 4	BSTS 3	BSTS 2	BSTS 1	BSTS 0

Return :

1. BIN Status Return (72H)
2. Busy (06H)
3. NAK (05H)

Name : BIN Status Return

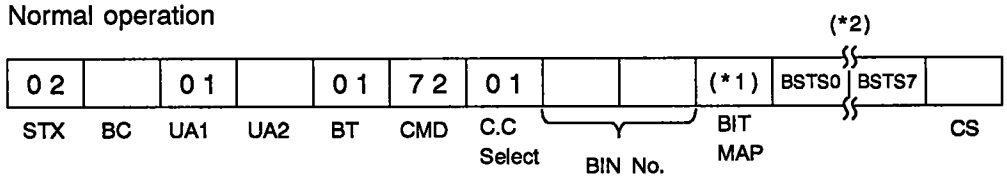
BT : 01H

Command : 72H

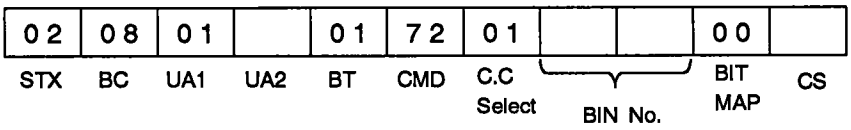
Function : Returns the bin status.

Data configuration :

1. Normal operation



2. For undefined bin number



(*1) BIT MAP

b7	b6	b5	b4	b3	b2	b1	b0
BSTS 7	BSTS 6	BSTS 5	BSTS 4	BSTS 3	BSTS 2	BSTS 1	BSTS 0

(*2) BIN STATUS MAP

BIT Status	7	6	5	4	3	2	1	0
BSTS 0 (*4)	Barcode Read	Barcode Read Error	0	0	0	0	Cassette in BIN	0
BSTS 1 (CASSETTE MARKER)	Don't care (Internal Use)							
BSTS 2 (CASSETTE SIZE)	0	0	0	0	0	(*5) Cassette Size		
BSTS 3 (Barcode DATA)	(*3) Barcode Type							
	Barcode Read DATA 1st							
BARCODE DATA KEYWORD	~							
	Barcode Read DATA 34th							

(*3) Barcode Type : 01H (Fixed : Flexicart)
The data is stored from the next data of the start code of the barcode.

【SONY Format (2 of 5) barcode data】

1st 34th

ID	TITLE	SOM	DUR	MODE	CODE
8 byte (ASCII)	16 byte (Depends on the CODE data)	4 byte (BCD)	4 byte (BCD)	1 byte	1 byte

MODE :
00 = Single segment
01 = Multi segment
09 = Others

CODE : Code of the TITLE area.
00 = ASCII (1byte) code
01 = ISO2022 (2byte) code

【Code 39 Format (3 of 9) barcode data】

1st 34th

DATA	(Reserved)	MODE	CODE
24 byte (ASCII)	8 byte	1 byte	1 byte

DATA :
The decoded data are stored.
If the data is less than 24 bytes, space code (20H) is padded.

MODE :
09H (Fixed : Other)

CODE :
00H = ASCII (1byte) code (Fixed)

(*4) BSTS 0 :
Barcode Read ····· "1" is set when the barcode is read correctly.
Barcode Read Error ··· "1" is set when barcode read is failed.
Cassette in BIN ····· "1" is set when cassette is inserted into the BIN completely.

(*5) Cassette Size
001 : S
010 : M
100 : L

Name : Sense Cassette Console Error Code

BT : 01H

Command : 63H

Function : Senses the error code which is the detail information of the error detected in Cassette console.

Data configuration :

02	06	01		01	63	01	80	
STX	BC	UA1	UA2	BT	CMD	C.C Select	DATA (Fixed)	CS

Return :

1. Cassette Console Error Code (73H)
2. NAK (05H)

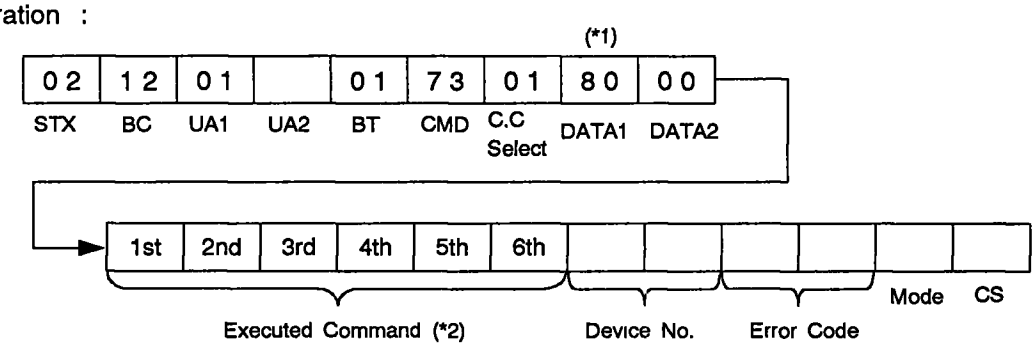
Name : Cassette Console Error Code Return

BT : 01H

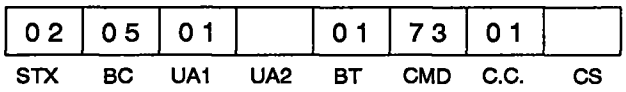
Command : 73H

Function : Returns the error code which includes the detail information detected in Cassette console.

Data configuration :



When there is not a error code



Data : (*1) DATA1 : 80H (Fixed), DATA2 : 00H (Fixed)

(*2) Executed Command : This is the command that was under execution when error has occurred. The error is occurred during Test Mode, 6 bytes are reported all in "0".

1st : Executed Command
2nd : Executed Macro Number
3rd :
4th :
5th :
6th : } data area of the error command

- If the length of Command Data is more than 4 bytes, upper 4 bytes are reported. If the length of Command Data is less than 4 bytes, 0 is put to lower bytes.

  Note : The C.C. Select data of the Source Bin and Destination Bin were omitted.

(*2) Device Number :

i) Belongs to BIN No.

Elevator : 0001H
VTR : 01xxH
BIN : 1001H to 9999H

ii) Others

Servo	:	A020H
Display Panel	:	A030H
CK-39	:	A040H
BIN Controller	:	A200H
Barcode	:	A300H
Protrusion	:	B000H
Self diagnosis	:	C000H
Common RAM	:	C010H
Imitialize	:	F000H

(*3) Error Code : It was defined for every device.
See the "Cassette Console Error Code" in Appendix.

(*4) Mode : Indicates a kind of Error Codes.
01H : A dynamic error occurs.
11H : A static error occurs.
12H : Cancels the static error.

Return :

1. Cassette Console Error Code Sense (63H)

Name : Sense Cassette Console Config.

BT : 01H

Command : 6FH

Function : Senses the bin configuration of a cassette console.

Data configuration :

02	05	01		01	6F	01	
STX	BC	UA1	UA2	BT	CMD	C.C Select	CS

Return :

1. Config. Data Return (7FH)
2. Busy (06H)
3. NAK (05H)

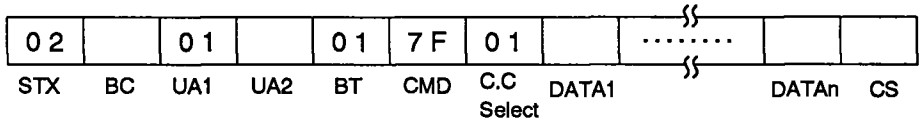
Name : Console Config. Data Return

BT : 01H

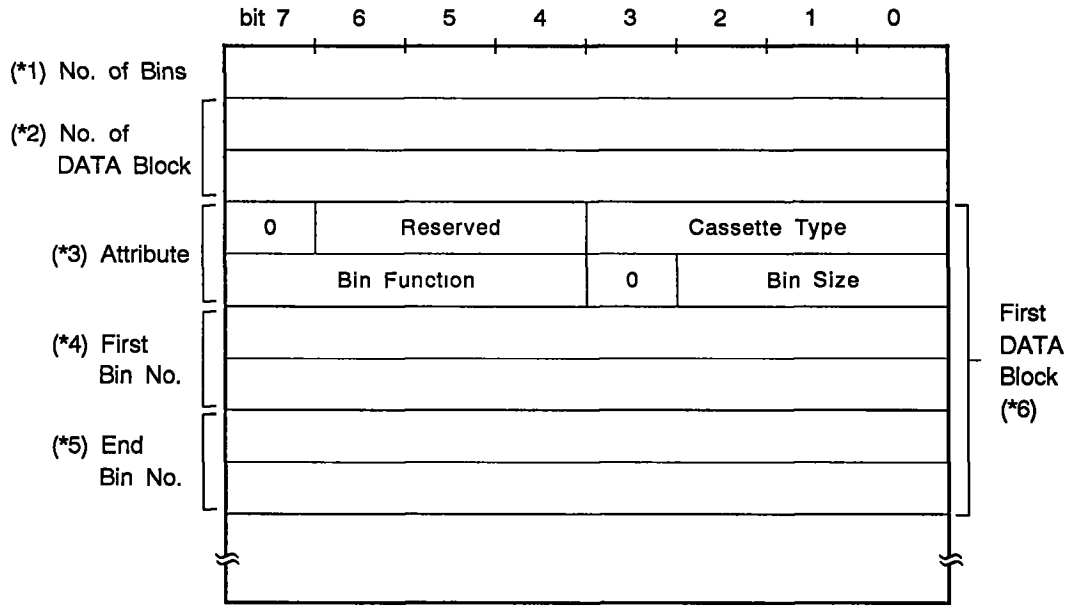
Command : 7FH

Function : Returns the bin configuration of a cassette console.

Data configuration :



DATA :

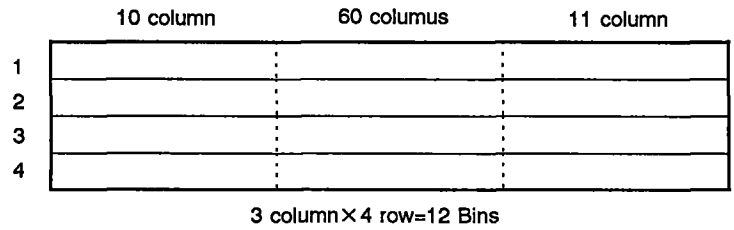


(*1) No. of BINs

Indicates the total number of address-defined BINs. These addresses are duplicated physically, so this does not mean total number of cassettes that can set in this console.

Example :

In the case that 1 block out of 4 raws is set, total number becomes 12 = address 10 columns x 4 raws + 11 columns x 4 raws + 60 columns x 4 raws.



(*2) No. of DATA Block

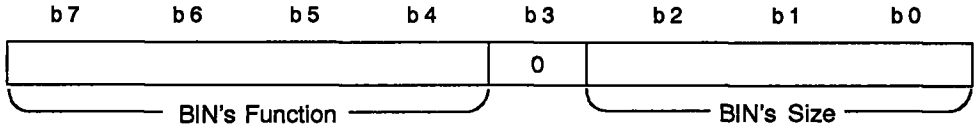
Indicates the number of data blocks obtained through combination of attribute, first bin Number and end bin Number.

(*3)

1st byte : Cassette Type

00H : 19 mm D-1/D-2 Cassette
01H : β (1/2") Cassette
02H : VHS Standard Cassette
0FH : Elevator

2nd byte : BIN Type



Bin Function :

bit	7	6	5	4	
	0	0	0	1	= Intelligent BIN
	0	1	0	1	= Elevator
	0	1	1	0	= VTR

BIN Size :

		bit	2(L)	1(M)	0(S)
bit 0 : S	BKFC-8D		1	1	1
1 : M	BKFC-10B		1	0	1
2 : L	BKFC-10S		0	0	1
	Elevator		1	1	1

※ All cassette sizes corresponding to all the specified BINs are reported.

(*4) Indicates the first bin number of the corresponding block.

(*5) Indicates the last bin number of the corresponding block.

(*6)

Example :

In the case of the system which has BKFC-8D three unit.

No. of data block = 3

1) Ist Block data

(1) Attribute 1st Byte = 00H : D2/D1 Cassette
2nd Byte = 17H : Intelligent Bin S/M/L size can be handled

(2) First Bin Number = 1001

(3) End Bin Number = 6004

2) 2nd Block data

(1) Attribute : Same as Ist Block

(2) First Bin Number = 1005

(3) End Bin Number = 6008

3) 3rd Block data

(1) Attribute : Same as Ist Block

(2) First Bin Number = 1009

(3) End Bin Number = 6012

4) 4th Block data

(1) Attribute : 1st Byte = 00H : D1/D2 Cassette
2nd Byte = 67H : VTR (S/M/L size)

(2) First Bin Number=0101

(3) End Bin Number=0101

5) 5th Block data

(1) Attribute : Same as 4th block

(2) First Bin Number=0102

(3) End Bin Number=0102

6) 6th block data

(1) Attribute : 1st Byte = 00H : D1/D2 Cassette
2nd Byte = 57H : Elevator (S/M/L size)

(2) First Bin Number=0001

(3) End Bin Number=0001

Return :

1. Console Config. Sense (6FH)