

- ORIGINAL -

MATROX CDV1082

RS232  
up all 4  
9600

# HITACHI VIDEO DISC PLAYER VIP 9550

## EXTERNAL COMPUTER INTERFACE MANUAL

Nec  
D4711C  
8840F7

October 1985

Board XF214  
V ±68490  
XF214-1  
CMK-140X

Hitachi

serial  
control

sh. A

961

HD 637B01Y0P



HITACHI

## CONTENT

|                                            |       |
|--------------------------------------------|-------|
| I. OUTLINE .....                           | p. 4  |
| II. THE RS232C INTERFACE .....             | p. 7  |
| III. COMMUNICATION FORMATS .....           |       |
| 1. DIRECT INSTRUCTIONS .....               | p. 9  |
| 2. INSTRUCTIONS WITH VARIABLES .....       | p. 11 |
| 3. STATUS REQUESTS .....                   | p. 16 |
| 4. ERROR MESSAGES .....                    | p. 18 |
| IV. INSTRUCTION/MESSAGE EXPLANATIONS ..... |       |
| 1. DIRECT INSTRUCTIONS .....               | p. 20 |
| 2. INSTRUCTIONS WITH VARIABLES .....       | p. 23 |
| 3. STATUS REQUESTS .....                   | p. 24 |
| 4. ERROR MESSAGES .....                    | p. 26 |
| V. QUICK REFERENCE .....                   |       |
| 1. INSTRUCTIONS AND MODE CHANGES .....     | p. 28 |
| 2. INSTRUCTION/MESSAGE CODES .....         | p. 29 |
| VI. APPENDIX .....                         |       |
| 1. RELATIONSHIP WITH THE VIP9500 .....     | p. 30 |

## I. OUTLINE

### 1. COMPUTER INTERFACE

The VIP 9550 is equipped with an RS232C interface with the connector on the rear of the player. This interface permits an external controller or host computer to control and monitor all player operations.

### 2. INSTRUCTIONS

#### (1) Direct Instructions

There are three types of direct instructions: (a) direct mode instructions (see Step 4. below), (b) direct main instructions (see Step 5, Step 6 - Ex. 1 or Step 8), (c) direct sub-instructions

Each direct instruction is a single byte. When the player receives a valid direct instruction, it executes it and returns a "job end" signal produced by adding 80H to the original instruction.

If the player receives an invalid instruction it returns "format error" (1DH).

#### (2) Instructions with Variables

Instructions with variables control operations such as search and section play (see Step 6- Ex 2, Ex3). Instructions with variables are multibyte instructions composed of a one-byte "verb", two or more variable bytes and the "enter" signal (41H).

When the player receives an instruction with variables, it first checks whether the format is valid. When the format is valid, it "echo back" the "enter" signal (41H) and executes the instruction. When execution is complete, it returns "job end" (where "job end" is the "verb" plus 80H), then waits for the next instruction.

When the instruction is invalid, the player returns "format error" (1DH), then waits for the next instruction.

#### (3) Status Requests

Status requests are single-byte instructions which fetch the player's internal operational status, the frame, chapter, users code, and program status code being played. When the player receives a status request, it echoes the original instruction and then returns the data requested. No "job end" is returned when a status request is executed.

### 3. ERROR MESSAGES

When the player encounters an error in, for example, search operations, it returns an error message. The error message may be transmitted immediately or following the next "echo back" or "job end" signal. The host must be prepared to respond appropriately.

### 4. OPERATION SEQUENCE

Following operational sequence is necessary to control the player. (The examples are in BASIC run on the IBM PC.)

- Step 1. Turn on the player and wait a second for initializing.  
 Step 2. Set "host ready" (HI at pin 4 of RS-232C)  
 Step 3. Open communication port.

---

```
10 OPEN "com 1:9600, N, 8, 1" AS #1
```

---

- Step 4. Send "remote" command (68H) to switch player from "local" mode to "remote" mode.  
 Read "job end" (E8H).

---

```
20 PRINT #1, CHR$ (&H68)
25 A$=INPUT$ (1, #1)
```

---

- Step 5. Send "play" command (25H) to start the player.  
 Read "job end" (A5H).  
 (Normally this operation takes about 10 secs.)

---

```
30 PRINT #1, CHR$ (&H25)
35 A$=INPUT$ (1, #1)
```

---

- Step 6. Send application commands, and read "echo back" and/or "job end".

Ex. 1. make still  
 "still" (24H)

---

```
37 PRINT #1, CHR$ (&H24)
38 A$=INPUT$ (1, #1)
```

---

Ex. 2. Search frame no. 12345

|          |       |
|----------|-------|
| "search" | (2BH) |
| "frame"  | (3AH) |
| "1"      | (31H) |
| "2"      | (32H) |
| "3"      | (33H) |
| "4"      | (34H) |
| "5"      | (35H) |
| "enter"  | (41H) |

---

```
40 PRINT #1, CHR$ (&H2B)
50 PRINT #1, CHR$ (&H3A)
60 PRINT #1, CHR$ (&H31)
70 PRINT #1, CHR$ (&H32)
80 PRINT #1, CHR$ (&H33)
90 PRINT #1, CHR$ (&H34)
100 PRINT #1, CHR$ (&H35)
110 PRINT #1, CHR$ (&H41)
115 A$=INPUT$ (2, #1)
```

---

Ex. 3 section play frames no. 12345 to 23456

|            |       |
|------------|-------|
| "search"   | (2BH) |
| "frame"    | (3AH) |
| "1"        | (31H) |
| "2"        | (32H) |
| "3"        | (33H) |
| "4"        | (34H) |
| "5"        | (35H) |
| "memory-1" | (24H) |
| "2"        | (32H) |
| "3"        | (33H) |
| "4"        | (34H) |
| "5"        | (35H) |
| "6"        | (36H) |
| "enter"    | (41H) |

---

```

120 PRINT #1, CHR$ (&H2B)
130 PRINT #1, CHR$ (&H3A)
140 PRINT #1, CHR$ (&H31)
150 PRINT #1, CHR$ (&H32)
160 PRINT #1, CHR$ (&H33)
170 PRINT #1, CHR$ (&H34)
180 PRINT #1, CHR$ (&H35)
190 PRINT #1, CHR$ (&H24)
200 PRINT #1, CHR$ (&H32)
210 PRINT #1, CHR$ (&H33)
220 PRINT #1, CHR$ (&H34)
230 PRINT #1, CHR$ (&H35)
240 PRINT #1, CHR$ (&H36)
250 PRINT #1, CHR$ (&H41)
255 A$=INPUT$ (2, #1)

```

---

Step 7. If necessary, request player operational status or mode, Read "echo back" and "data".

Ex. 4. Request frame number  
"Pres. frame" (6BH)

---

```

260 PRINT #1, CHR$ (&H6B)
265 A$=INPUT$ (3, #1)

```

---

Step 8. Send "reject" command (2FH) to put the player in "park" mode, read "job end" (AFH).

---

```

270 PRINT #1, CHR$ (&H2F)
275 A$=INPUT$ (1, #1)

```

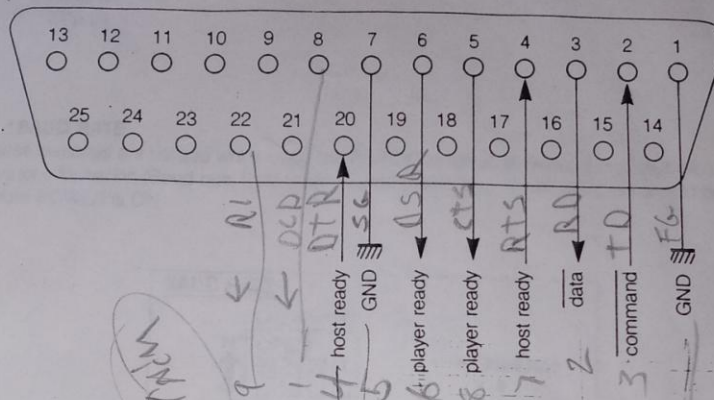
---

Step 9. Press the "eject" button on the player. Remove the disc and turn the player off.

## II. THE RS232C INTERFACE

### 1. CONNECTOR

- (1) Type RS232C  
(25 pins female at player side)
- (2) View



Note) This figure shows the view from rear of the player.

BB1608  
Bola

## 2. WIRING

Wiring to the external computer is made with parallel (not crossed) wiring cable. Since other pins may be connected internally, use of a cable with only the pins indicated above connected is highly recommended.

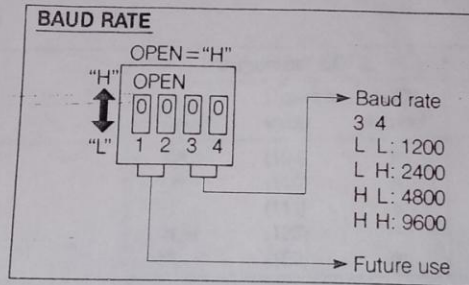
## 3. TRANSMISSION FORMAT

Signals are transmitted asynchronously in accordance with the RS232C standard using following format.

|                |                         |
|----------------|-------------------------|
| (1) Baud rate* | 9600/4800/2400/1200 bps |
| (2) Start bit  | 1                       |
| Data bits      | 8                       |
| Parity bit     | nil                     |
| Stop bit       | 1                       |

### \*BAUD RATE

These switches are utilized when using the RS-232C terminal, to select the various circuit control information (Baud rate, Data length, Parity check, etc.). These switches should be set before POWER is ON.



Matrix CPU 1082

1 up  
2 up  
3 down  
4 down

### III. COMMUNICATION FORMATS

#### 1. DIRECT INSTRUCTIONS

Direct instructions control basic player operations. They are divided into three kinds.

(a) Direct mode instructions which set the player's mode to either "remote" or "local".

Note: it is necessary to specify "remote" mode when the player is initialized, since the player defaults to "local" mode whenever it is turned on.

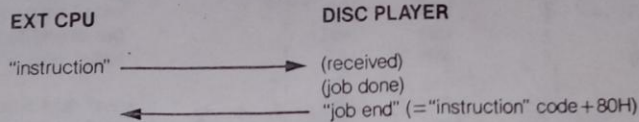
(b) Direct main instructions control primary player operations such as play, pause, v. mute, reject, still, slow, fast, etc.

(c) Direct sub-instructions control audio output and on-screen display conditions.

Each direct instruction is a single byte. Following a direct instruction's execution, the player returns "job end", and waits for the next instruction.

The "job end" signal is produced by adding 80 Hex to the original instruction. *128 decimal*

The direct instruction communication format can be summarized as follows:



#### (a) Direct mode instructions

| INSTRUCTION | "instruction" CODE |               |              | "job end" CODE |               |
|-------------|--------------------|---------------|--------------|----------------|---------------|
|             | Hex value          | Decimal value | ASCII symbol | Hex value      | Decimal value |
| remote      | 68H                | (104)         | h            | E8H            | (232)         |
| mode-1      | 6EH                | (110)         | n            | EEH            | (238)         |
| mode-2      | 6FH                | (111)         | o            | EFH            | (239)         |
| mode-3      | 7EH                | (126)         | ~            | FEH            | (254)         |
| local       | 6DH                | (109)         | m            | EDH            | (237)         |

#### (b) Direct main instructions

| INSTRUCTION   | "instruction" CODE |               |              | "job end" CODE |               |
|---------------|--------------------|---------------|--------------|----------------|---------------|
|               | Hex value          | Decimal value | ASCII symbol | Hex value      | Decimal value |
| play-fwd      | 25H                | (37)          | %            | A5H            | (165)         |
| play-rev      | 42H                | (66)          | B            | C2H            | (194)         |
| pause         | 2AH                | (42)          | *            | AAH            | (170)         |
| v. mute       | 43H                | (67)          | C            | C3H            | (195)         |
| reject        | 2FH                | (47)          | /            | AFH            | (175)         |
| slow-fwd (*)  | 23H                | (35)          | #            | A3H            | (163)         |
| slow-rev      | 28H                | (40)          | (            | A8H            | (168)         |
| still-fwd (*) | 24H                | (36)          | \$           | A4H            | (164)         |
| still-rev (*) | 29H                | (41)          | )            | A9H            | (169)         |
| fast-fwd (*)  | 21H                | (33)          | !            | A1H            | (161)         |

| INSTRUCTION         | "instruction" CODE |               |              | "job end" CODE |               |
|---------------------|--------------------|---------------|--------------|----------------|---------------|
|                     | Hex value          | Decimal value | ASCII symbol | Hex value      | Decimal value |
| fast-rev            | 26H                | (38)          | &            | A6H            | (166)         |
| scan-fwd            | 22H                | (34)          | "            | A2H            | (162)         |
| scan-rev            | 27H                | (39)          | '            | A7H            | (167)         |
| field type 0x-fwd   | 50H                | (80)          | P            | D0H            | (208)         |
| field type 1/4x-fwd | 51H                | (81)          | Q            | D1H            | (209)         |
| field type 1/2x-fwd | 52H                | (82)          | R            | D2H            | (210)         |
| field type 1x-fwd   | 53H                | (83)          | S            | D3H            | (211)         |
| field type 2x-fwd   | 54H                | (84)          | T            | D4H            | (212)         |
| field type 3x-fwd   | 55H                | (85)          | U            | D5H            | (213)         |
| field type 4x-fwd   | 56H                | (86)          | V            | D6H            | (214)         |
| field type 5x-fwd   | 57H                | (87)          | W            | D7H            | (215)         |
| field type 6x-fwd   | 58H                | (88)          | X            | D8H            | (216)         |
| field type 7x-fwd   | 59H                | (89)          | Y            | D9H            | (217)         |
| frame type 3x-rev   | 61H                | (97)          | a            | E1H            | (225)         |
| frame type 2x-rev   | 62H                | (98)          | b            | E2H            | (226)         |
| frame type 1x-rev   | 63H                | (99)          | c            | E3H            | (227)         |
| frame type 0x-fwd   | 64H                | (100)         | d            | E4H            | (228)         |
| frame type 1x-fwd   | 65H                | (101)         | e            | E5H            | (229)         |
| frame type 2x-fwd   | 66H                | (102)         | f            | E6H            | (230)         |
| frame type 3x-fwd   | 67H                | (103)         | g            | E7H            | (231)         |
| frame type 4x-fwd   | 5CH                | (92)          | ¥            | DCH            | (220)         |
| frame type 5x-fwd   | 5DH                | (93)          | ]            | DDH            | (221)         |
| frame type 6x-fwd   | 5EH                | (94)          | -            | DEH            | (222)         |
| 2 frame-still (*)   | 75H                | (117)         | u            | F5H            | (245)         |

(c) Direct sub-instruction

| INSTRUCTION | "instruction" CODE |               |              | "job end" CODE |               |
|-------------|--------------------|---------------|--------------|----------------|---------------|
|             | Hex value          | Decimal value | ASCII symbol | Hex value      | Decimal value |
| cx          | 3BH                | (59)          | ;            | BBH            | (187)         |
| L/1         | 2EH                | (46)          | .            | AEH            | (174)         |
| L/1 on      | 48H                | (72)          | H            | C8H            | (200)         |
| L/1 off     | 49H                | (73)          | I            | C9H            | (201)         |
| R/2         | 2DH                | (45)          | -            | ADH            | (173)         |
| R/2 on      | 4AH                | (74)          | J            | CAH            | (202)         |
| R/2 off     | 4BH                | (75)          | K            | CBH            | (203)         |
| frame (*)   | 3AH                | (58)          | :            | BAH            | (186)         |
| frame on    | 4CH                | (76)          | L            | CCH            | (204)         |
| frame off   | 4DH                | (77)          | M            | CDH            | (205)         |
| chapter (*) | 2CH                | (44)          | ,            | ACH            | (172)         |
| chapter on  | 4EH                | (78)          | N            | CEH            | (206)         |
| chapter off | 4FH                | (79)          | O            | CFH            | (207)         |

(\*): these instructions may also be combined with variables.  
(see p.11)

## 2. INSTRUCTIONS WITH VARIABLES

Instruction with variables control player operations such as variable slow, track jump, search (frame/chapter), section play (normal/fast-fwd/slow-fwd) repeat section play and seamless section play. Each instruction with variables begins with a single-byte "verb" which is followed by two or more bytes representing the variables and "enter" (41H) to mark the end of the instruction. The valid formats are as follows:

- (1) variable slow (fwd/rev)  
variable slow-fwd/variable slow-rev  
numeric ( $\leq 127$ : one nth of slow speed)  
enter
- (2) variable slow terminate (fwd/rev)  
variable slow-fwd/variable slow-rev  
numeric ( $\leq 127$ : one nth of slow speed)  
memory-1  
numeric (= end address)  
enter
- (3) track jump (fwd/rev)  
jump-fwd/jump-rev  
numeric (n: track to be jumped  $\dots 1 \leq n \leq 200$ )  
enter
- (4) search (frame/chapter)  
search  
frame/chapter  
(nil)/2 frame still  
numeric (=start address)  
enter
- (5) Section play

Section play is performed with the following combination instruction.

- (i) Section play  
search  
frame/chapter\*  
(nil)/2 frame-still  
numeric (=start address)  
memory-1  
(nil)/fast-fwd/slow-fwd  
numeric (=end address)  
enter

(a) forward; start address < end address

(b) reverse; start address > end address

\*When in "chapter" mode, a reverse or 2 frame-still operation should not be specified.

(ii) Terminate section play

Without black out the picture, section play (forward/reverse) starting from current address is obtainable with the following new combination instruction.

```
search
frame/chapter*
(nil)/2 frame-still
terminate (= 74H)
memory-1
(nil)/fast-fwd/slow-fwd
numeric (=end address)
enter
```

- (a) forward; current address < end address
- (b) reverse; current address > end address

(6) Repeat section play

Repeat section play is performed with the following combination instruction.

(i) Repeat Section Play

```
search
frame/chapter*
(nil)/2 frame-still
numeric (=start address)
memory-1
numeric (=end address)
memory-2
numeric (0: endless)
      (n ≤ 254: number of times to repeat)
enter
```

- (a) forward; start address < end address
- (b) reverse; start address > end address

(ii) Terminate repeat section play

Repeat section play (forward/reverse) without black out the picture for the first sequence starting from current address is obtainable with the following new combination instruction.

```
search
frame/chapter*
(nil)/2 frame-still
terminate (= 74H)
memory-1
numeric (=end address)
memory-2
numeric (0: endless)
      (n ≤ 254: number of times to repeat)
enter
```

- (a) forward; current address < end address
- (b) reverse; current address > end address

\*When in "chapter" mode, a reverse or 2 frame still Operation should not be specified.

(7) Seamless section play

Continuous section play with alternately forward and reverse direction is obtained with the following combination instruction.

(i) Seamless section play

```
search
frame
numeric (=start address)
memory-1
numeric (=end address)
memory-2
numeric=255
enter
```

where; start address ≤ end address

(ii) Terminate seamless section play

Seamless section play without black out the picture starting from current address is obtained with the following format.

```
search
terminate (= 74H)
memory-1
numeric (=end address)
memory-2
numeric=255
enter
```

where; current address ≤ end address

When the player receives an instruction with variables, it first checks to make sure the format is valid, if no error is found it "echo back" the "enter" signal (41H) and executes the instruction. It then returns a "job end" and waits for the next instruction.  
If the format check discovers an error, the player returns "format error" (1DH) and waits for another instruction.

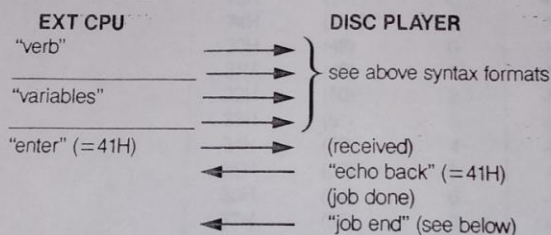
However, while in section play mode, any instructions such as still, search etc. are also acceptable, in addition to play, V. mute, reject and pause instructions.  
Please note following instructions temporally interrupt then resume to the section play mode.

- (i) pause; restore section play when re-issued.
  - (ii) Track jump; keeps section play after executing jump. \*
- \* If the start or end address is skipped by a track jump, the player performs the following operations:

- (a) Track jump exceeds the end address of section play, then the player will send 60H (section play trouble-2) and enter still mode.
- (b) Track jump exceeds the minimum or maximum recorded number while player is in section play mode, then the player will send 7FH (section play trouble-3) and enter still mode at address one or maximum frame number.

However, while in section play modes, instruction execution can be interrupted by "play", "v. mute" and "pause" instructions. "Play", "v. mute" erase search commands and initiate a soft reset. In contrast, "pause" is a toggle which halts execution of the previous command on its first occurrence but permits continued execution following its second occurrence.

The communication format of instructions with variables can be summarized as follows:



\*Verbs

| INSTRUCTION             | "Instruction" CODE |               |              | "job end CODE |               |
|-------------------------|--------------------|---------------|--------------|---------------|---------------|
|                         | Hex value          | Decimal value | ASCII symbol | Hex value     | Decimal value |
| variable slow-fwd       | 44H                | (68)          | D            | C4H           | (196)         |
| variable slow-rev       | 45H                | (69)          | E            | C5H           | (197)         |
| jump-fwd                | 46H                | (70)          | F            | C6H           | (198)         |
| jump-rev                | 47H                | (71)          | G            | C7H           | (199)         |
| search (frame/chapter)  | 2BH                | (43)          | +            | B0H           | (176)         |
| section play (normal)   | 2BH                | (43)          | +            | B1H           | (177)         |
| section play (fast-fwd) | 2BH                | (43)          | +            | B4H           | (180)         |
| section play (slow-fwd) | 2BH                | (43)          | +            | B3H           | (179)         |
| repeat section play     | 2BH                | (43)          | +            | B2H           | (178)         |
| variable slow terminate | 44H                | (68)          | D            | B5H           | (181)         |

\*Variables

|                       |     |       |    |        |
|-----------------------|-----|-------|----|--------|
| frame                 | 3AH | (58)  | :  | - N/A- |
| chapter               | 2CH | (44)  | .  | -N/A-  |
| fast-fwd              | 21H | (33)  | !  | -N/A-  |
| slow-fwd              | 23H | (35)  | #  | -N/A-  |
| memory-1 (=still-fwd) | 24H | (36)  | \$ | -N/A-  |
| memory-2 (=still-rev) | 29H | (41)  | )  | -N/A-  |
| 2 frame-still         | 75H | (117) | u  | -N/A-  |
| terminate             | 74H | (116) | t  | -N/A-  |
| 0                     | 30H | (48)  | 0  | -N/A-  |
| 1                     | 31H | (49)  | 1  | -N/A-  |
| 2                     | 32H | (50)  | 2  | -N/A-  |
| 3                     | 33H | (51)  | 3  | -N/A-  |
| 4                     | 34H | (52)  | 4  | -N/A-  |
| 5                     | 35H | (53)  | 5  | -N/A-  |
| 6                     | 36H | (54)  | 6  | -N/A-  |
| 7                     | 37H | (55)  | 7  | -N/A-  |
| 8                     | 38H | (56)  | 8  | -N/A-  |
| 9                     | 39H | (57)  | 9  | -N/A-  |

\*Enter

| enter |           |               |              | "echo back"               |
|-------|-----------|---------------|--------------|---------------------------|
|       | Hex value | Decimal value | ASCII symbol | Hex value (Decimal) ASCII |
| enter | 41H       | (65)          | A            | 41H (65) A                |

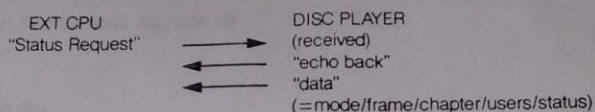
Note) If an instruction with variables references a frame number input greater than 64,000 the instruction is invalid and results in a "format error" message.

### 3. STATUS REQUEST

Status Requests query the player for current operational status, the frame or time number, uses code, and program status code, chapter

Each status request is a single byte. When it receives a Status Request, the player issues "echo back" and returns the data requested. No "job end" is send when these instructions are executed.

The Status Request communication can be summarized as follows:



\*Status Request

| INSTRUCTION           | "instruction" CODE |               |              | "echo back" CODE |               |              |
|-----------------------|--------------------|---------------|--------------|------------------|---------------|--------------|
|                       | Hex value          | Decimal value | ASCII symbol | Hex value        | Decimal value | ASCII symbol |
| Present status-1      | 69H                | (105)         | i            | 69H              | (105)         | i            |
| Present status-2      | 6AH                | (106)         | j            | 6AH              | (106)         | j            |
| Present frame (/time) | 6BH                | (107)         | k            | 6BH              | (107)         | k            |
| Present chapter       | 6CH                | (108)         | l            | 6CH              | (108)         | l            |
| Users code*1          | 76H                | (118)         | v            | 76H              | (118)         | v            |
| Program status code*2 | 77H                | (119)         | w            | 77H              | (119)         | w            |

"Present status-1" requests the status of operations controlled by direct main instructions. "Present status-2" requests the status of operations controlled by direct sub-instructions (see page 24-25 for details). The frame number is returned in two-bytes (higher-1st, lower-2nd) binary, and the picture number in one-byte binary form.

Time number is returned in two-bytes (higher-00H, lower-time number in the binary).

Users and program status code is returned in two-bytes (higher-1st, lower-2nd).

#### \*1 Users code

The users code is intended for filing and identification and can be inserted as an option in the lead-in and lead-out area. The data content is up to the disk-manufacturer.

code: 8 X1 D X3 X4 X5

X1=0 through 7; X3, X4, X5=0 through F.

Note) 4 bit data  
X3=X31, X32, X33, X34 LSB  
X4=X41, X42, X43, X44 LSB  
X5=X51, X52, X53, X54 LSB

### Program status code \*2

The program status code identifies the use of the audio and video channels and will be inserted in the active program area.

Code: 8  $\frac{DC}{BA}$  X3, X4, X5

Definition of the data in Program Status Code 8  $\frac{DC}{BA}$  X3, X4, X5

- DC=CX noise reduction on; BA=CX noise reduction off

- X31 indicates disk size:

0=12 inch; 1=8 inch

X32 indicates disk size:

0=first side; 1=second side

X33 indicates if there are anywhere on the disk teletext signals present or not:

0=teletext signals absent; 1=teletext signal present

X34 indicates if the audio signal is FM — FM multiplex modulated or not

0=FM — FM multiplex off; 1=FM — FM multiplex on

X42 indicates if the video format contains normal analogue video signal or during the active parts of the line a digital signal

0=analogue video; 1=digital signal

- X41, X43, X44 together with X34 are indicating the status of the audio channels according the following table:

| X41, X34, X43 X44 | program<br>dump | FM — FM<br>multiplex | channel<br>1 | channel<br>2 |
|-------------------|-----------------|----------------------|--------------|--------------|
| 0000              | off             | off                  | stereo       |              |
| 0001              | off             | off                  | mono         |              |
| 0010              | off             | off                  | future use   |              |
| 0011              | off             | off                  | bilingual    |              |
| 0100              | off             | on                   | stereo       | stereo       |
| 0101              | off             | on                   | stereo       | bilingual    |
| 0110              | off             | on                   | bilingual    | stereo       |
| 0111              | off             | on                   | bilingual    | bilingual    |
| 1000              | on              | off                  | mono         | dump         |
| 1001              | on              | off                  | mono         | dump         |
| 1010              | on              | off                  | future use   |              |
| 1011              | on              | off                  | mono         | dump         |
| 1100              | on              | on                   | stereo       | dump         |
| 1101              | on              | on                   | stereo       | dump         |
| 1110              | on              | on                   | bilingual    | dump         |
| 1111              | on              | on                   | bilingual    | dump         |

X5 is an error check code on X4 with even parity bit, according to Hamming Code,

X51 is the parity with X41, X42 and X44

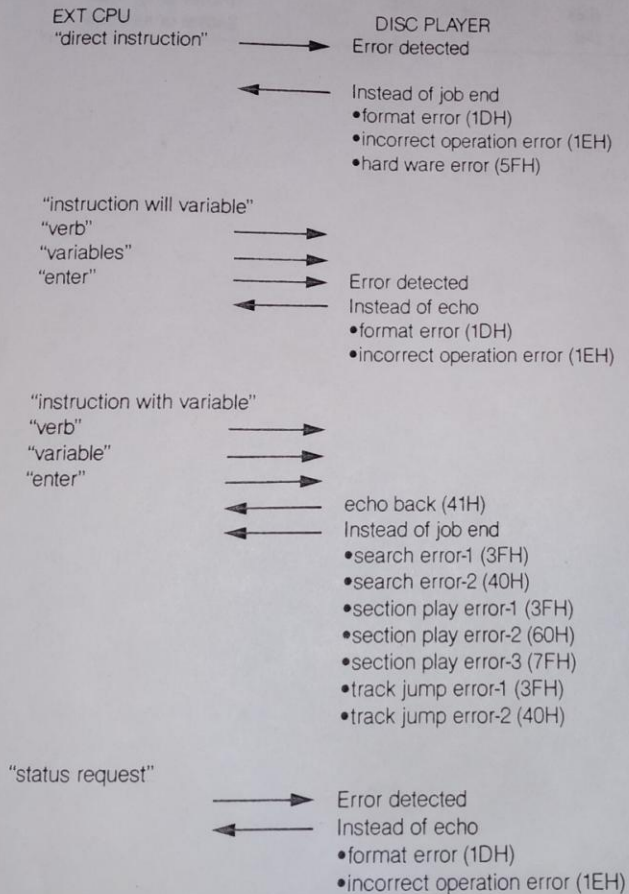
X52 is the parity with X41, X43 and X44

X53 is the parity with X42, X43 and X44

#### 4. ERROR MESSAGE

When the external controller of host computer transmits an undefined instruction, the player ignores it and continues its current operation. When an instruction is invalid (1) because it cannot be executed, e.g., a "still" instruction while the player is in "park" mode, or (2) because of a syntax error in an instruction with variables, the player returns "format error" (1DH). For example, when the spindle motor fails to lock up at the time of lead-in, a "hardware error" (5FH) will be returned. Error messages are sent immediately of following the next "echo back" or "job end". The external controller or host computer must be programmed to respond correctly to these messages.

Can be summarized as follows:



\*Error message

| ERROR STATUS              | Hex value | Decimal value | ASCII symbol |
|---------------------------|-----------|---------------|--------------|
| format error              | 1DH       | (29)          | GS           |
| incorrect operation error | 1EH       | (30)          | RS           |
| hardware error            | 5FH       | (95)          | —            |
| search error-1            | 3FH       | (63)          | ?            |
| search error-2            | 40H       | (64)          | @            |
| section play error-1      | 3FH       | (63)          | ?            |
| section play error-2      | 60H       | (96)          | .            |
| section play error-3      | 7FH       | (127)         | DEL          |
| track jump error-1        | 3FH       | (63)          | ?            |
| track jump error-2        | 40H       | (64)          | @            |

## IV. INSTRUCTION/MESSAGE EXPLANATIONS

### 1. DIRECT INSTRUCTIONS

#### (a) Direct mode instructions

| INSTRUCTION | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-----------|--------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. remote   | 68H       | (104)              | h            | <ul style="list-style-type: none"> <li>* Selects "remote" mode, permitting external computer control.</li> <li>This instruction is necessary to initialize the player, since the player defaults to "local" mode when it is turned on.</li> <li>* If this instruction is issued during operation, the player resumes normal play forward with initial status. (for initial status, see p.25)</li> </ul> |
| 2. mode-1   | 6EH       | (110)              | n            | <ul style="list-style-type: none"> <li>* Sets video on and waits for next instruction, even if an incorrect address search is attached to "search" or "section play" instruction and an error message is issued.</li> <li>* The player defaults to "mode-1" whenever it is turned on.</li> </ul>                                                                                                        |
| 3. mode-2   | 6FH       | (111)              | o            | <ul style="list-style-type: none"> <li>* Mutes Video and waits for next instruction, when an incorrect address search is attached to a "search" or "section play" instruction and an error message is issued.</li> </ul>                                                                                                                                                                                |
| 4. mode-3   | 7EH       | (126)              | ~            | <ul style="list-style-type: none"> <li>* Used to mute the video image and play only the audio channel.</li> <li>* This mode is cleared by selecting Mode 1 or Mode 2.</li> <li>* Mode 1 and Mode 2 functions remain valid after Mode 3 is selected.</li> </ul>                                                                                                                                          |
| 5. local    | 6DH       | (109)              | m            | <ul style="list-style-type: none"> <li>* Switches player to "local" from "remote" mode.</li> </ul>                                                                                                                                                                                                                                                                                                      |

#### (b) Direct main-instructions

| INSTRUCTION | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                                                |
|-------------|-----------|--------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. play-fwd | 25H       | (37)               | %            | <ul style="list-style-type: none"> <li>a. Starts play-forward from "pack" mode.</li> <li>b. Changes to "play-fwd" mode from any other playback mode acceptable at any time.</li> </ul> |
| 2. play-rev | 42H       | (66)               | B            | <ul style="list-style-type: none"> <li>* Changes to "play-rev" mode from any other playback mode.</li> </ul>                                                                           |

| INSTRUCTION                   | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                           |
|-------------------------------|-----------|--------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. pause                      | 2AH       | (42)               | *            | a. Switches player to "pause (still with video)" mode from any other playback mode.<br>b. Resumes the last operation mode preceding previous "pause" instruction. |
| 4. v. mute                    | 43H       | (67)               | C            | * Changes to "v. mute (still w/o video)" mode from any other playback mode.                                                                                       |
| 5. reject                     | 2FH       | (47)               | /            | * Changes to "park" mode acceptable at any time.                                                                                                                  |
| 6. slow-fwd                   | 23H       | (35)               | #            | * Changes to "slow-fwd (1/5 normal speed)" mode from any other playback mode.                                                                                     |
| 7. slow-rev                   | 28H       | (40)               | (            | * Changes to "slow-rev (1/5 normal speed)" mode from any other playback mode.                                                                                     |
| 8. still-fwd                  | 24H       | (36)               | \$           | a. Changes to "still" mode from any other playback mode.<br>b. Plays "frame by frame (fwd)" during "still" mode playback.                                         |
| 9. still-rev                  | 29H       | (41)               | )            | a. Changes to "still" mode from any other playback mode.<br>b. Plays "frame by frame (rev)" during "still" mode playback.                                         |
| 10. fast-fwd                  | 21H       | (33)               | !            | * Changes to "fast-fwd (3 times normal speed) mode from any other playback mode.                                                                                  |
| 11. fast-rev                  | 26H       | (38)               | &            | * Changes to "fast-rev (3 times normal speed) mode from any other playback mode.                                                                                  |
| 12. scan-fwd                  | 22H       | (34)               | "            | * Changes to "scan-fwd" mode from any other playback mode.                                                                                                        |
| 13. scan-rev                  | 27H       | (39)               | '            | * Changes to "scan-rev" mode from any other playback mode.                                                                                                        |
| 14. field type special effect |           |                    |              |                                                                                                                                                                   |
| 0x-fwd                        | 50H       | (80)               | P            | * Changes to "field type special effect", mode from any other playback mode.                                                                                      |
| 1/4x-fwd                      | 51H       | (81)               | Q            |                                                                                                                                                                   |
| 1/2x-fwd                      | 52H       | (82)               | R            |                                                                                                                                                                   |
| 1x-fwd                        | 53H       | (83)               | S            |                                                                                                                                                                   |
| 2x-fwd                        | 54H       | (84)               | T            |                                                                                                                                                                   |
| 3x-fwd                        | 55H       | (85)               | U            |                                                                                                                                                                   |
| 4x-fwd                        | 56H       | (86)               | V            |                                                                                                                                                                   |
| 5x-fwd                        | 57H       | (87)               | W            |                                                                                                                                                                   |
| 6x-fwd                        | 58H       | (88)               | X            |                                                                                                                                                                   |
| 7x-fwd                        | 59H       | (89)               | Y            |                                                                                                                                                                   |

| INSTRUCTION                   | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                     |
|-------------------------------|-----------|--------------------|--------------|-----------------------------------------------------------------------------|
| 15. frame type special effect |           |                    |              |                                                                             |
| 3x-rev                        | 61H       | (97)               | a            | * Changes to "frame type special effect" mode from any other playback mode. |
| 2x-rev                        | 62H       | (98)               | b            |                                                                             |
| 1x-rev                        | 63H       | (99)               | c            |                                                                             |
| 0x-rev                        | 64H       | (100)              | d            |                                                                             |
| 1x-fwd                        | 65H       | (101)              | e            |                                                                             |
| 2x-fwd                        | 66H       | (102)              | f            |                                                                             |
| 3x-fwd                        | 67H       | (103)              | g            |                                                                             |
| 4x-fwd                        | 5CH       | (92)               | ¥            |                                                                             |
| 5x-fwd                        | 5DH       | (93)               | ]            |                                                                             |
| 6x-fwd                        | 5EH       | (94)               |              |                                                                             |
| 16. 2 frame-still             |           |                    |              |                                                                             |
|                               | 75H       | (117)              | u            | * Changes to "2 frame-still" mode from any other playback mode.             |

Note) "v. mute" is acceptable any time after the player start up operation is complete.

(c) Direct sub-instructions

| INSTRUCTION     | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                       |
|-----------------|-----------|--------------------|--------------|-----------------------------------------------|
| 1. cx           | 3BH       | (59)               | :            | *Toggles "noise reduction", "on" or "off".    |
| 2. L/I          | 2EH       | (46)               | .            | *Toggles "left sound", "on" or "off".         |
| 3. L/I on       | 48H       | (72)               | H            | *Turns "left sound on".                       |
| 4. L/I off      | 49H       | (73)               | I            | *Turns "left sound off".                      |
| 5. R/2          | 2DH       | (45)               | -            | *Toggles "right sound", "on" or "off".        |
| 6. R/2 on       | 4AH       | (74)               | J            | *Turns "right sound on".                      |
| 7. R/2 off      | 4BH       | (75)               | K            | *Turns "right sound off".                     |
| 8. frame        | 3AH       | (58)               | :            | *Toggles "frame indication", "on" or "off".   |
| 9. frame on     | 4CH       | (76)               | L            | *Turns "frame indication on".                 |
| 10. frame off   | 4DH       | (77)               | M            | *Turns "frame indication off".                |
| 11. chapter     | 2CH       | (44)               | .            | *Toggles "chapter indication", "on" or "off". |
| 12. chapter on  | 4EH       | (78)               | N            | *Turns "chapter indication on".               |
| 13. chapter off | 4FH       | (79)               | O            | *Turns "chapter indication off".              |

## 2. INSTRUCTIONS WITH VARIABLES

| INSTRUCTION             | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                                                                                  |
|-------------------------|-----------|--------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. variable slow-fwd    | 44H       | (68)               | D            | *Sets 1/N th "slow speed" for every playback mode.                                                                                                                                                                       |
| 2. variable slow-rev    | 45H       | (69)               | E            | *Sets 1/N th "slow speed" for every playback mode.                                                                                                                                                                       |
| 3. jump-fwd             | 46H       | (70)               | F            | *Sets "number of tracks" to jump forward.                                                                                                                                                                                |
| 4. jump-rev             | 47H       | (71)               | G            | *Sets "number of tracks" to jump backward.                                                                                                                                                                               |
| 5. search               | 2BH       | (43)               | +            | *Sets frame or chapter start address for every playback mode.                                                                                                                                                            |
| 1. frame                | 3AH       | (58)               | :            | *Specifies "frame search" or "frame section play" with search command.                                                                                                                                                   |
| 2. chapter              | 2CH       | (44)               | :            | *Specifies "chapter search" or "chapter section play" with search command.                                                                                                                                               |
| 3. fast-fwd             | 21H       | (33)               | !            | *Specifies the section play with fast speed 3 times normal.                                                                                                                                                              |
| 4. slow-fwd             | 23H       | (35)               | #            | *Specifies section play with slow speed 1/5 normal.                                                                                                                                                                      |
| 5. memory-1 (still-fwd) | 24H       | (36)               | \$           | *Sets "end address" after "start address".                                                                                                                                                                               |
| 6. memory-2 (still-rev) | 29H       | (41)               | )            | *Sets "number of times" after "end address" for repeat section play.                                                                                                                                                     |
| 7. terminate            | 74H       | (116)              | t            | *Sets "end address" after terminate                                                                                                                                                                                      |
| 8. 2 frame-still        | 75H       | (117)              | u            | *Sets "2 frame-still" after finishing the any "search" and "section play".                                                                                                                                               |
| 9. 0                    | 30H       | (48)               | 0            | *ASCII digits are required for instructions with variables as follows:                                                                                                                                                   |
| 10. 1                   | 31H       | (49)               | 1            | 2 digits for chapter address,                                                                                                                                                                                            |
| 11. 2                   | 32H       | (50)               | 2            | 3 digits for variable-slow                                                                                                                                                                                               |
| 12. 3                   | 33H       | (51)               | 3            | speed, jump                                                                                                                                                                                                              |
| 13. 4                   | 34H       | (52)               | 4            | track and repeat                                                                                                                                                                                                         |
| 14. 5                   | 35H       | (53)               | 5            | section play.                                                                                                                                                                                                            |
| 15. 6                   | 36H       | (54)               | 6            | 5 digits for frame address                                                                                                                                                                                               |
| 16. 7                   | 37H       | (55)               | 7            |                                                                                                                                                                                                                          |
| 17. 8                   | 38H       | (56)               | 8            |                                                                                                                                                                                                                          |
| 18. 9                   | 39H       | (57)               | 9            |                                                                                                                                                                                                                          |
| 1. enter                | 41H       | (65)               | A            | *Terminator for instructions with variables. When the player receives a valid instruction with variables, it "echo back" this code (41H) and executes the instruction. When execution is complete, it returns "job end". |

### 3. STATUS REQUESTS

| INSTRUCTION            | "instruction" CODE |               |              | "echo-back" and "data" CODE |                          |                      |
|------------------------|--------------------|---------------|--------------|-----------------------------|--------------------------|----------------------|
|                        | Hex value          | Decimal value | ASCII symbol | echo-back                   | 1st ANS.                 | 2nd ANS.             |
| 1. Present status-1    | 69H                | (105)         | i            | 69H (105) i                 | main operation status *1 | —                    |
| 2. Present status-2    | 6AH                | (106)         | j            | 6AH (106) j                 | sub operation mode *2    | —                    |
| 3. Present frame       | 6BH                | (107)         | k            | 6BH (107) k                 | higher 8bits (binary) *3 | lower 8bits (binary) |
| 4. Present chapter     | 6CH                | (108)         | l            | 6CH (108) l                 | 8 bits (binary)          | —                    |
| 5. Users code          | 76H                | (118)         | v            | 76H (118) v                 | X1 and X3 (with CX)      | X4 and X5            |
| 6. Program status code | 77H                | (119)         | w            | 77H (119) w                 | D and X3 (without CX)    | X4 and X5            |

\*1: Main operation status

| OPERATION                   | — at start of operation — |               |              | — after complete of operation —       |               |              |
|-----------------------------|---------------------------|---------------|--------------|---------------------------------------|---------------|--------------|
|                             | Hex value                 | Decimal value | ASCII symbol | Hex value                             | Decimal value | ASCII symbol |
| •play-fwd                   | 25H                       | (37)          | %            | A5H                                   | (165)         |              |
| •play-rev                   |                           | —             |              | C2H                                   | (194)         |              |
| •still                      |                           | —             |              | A4H                                   | (164)         |              |
| •other direct instructions  |                           | —             |              | same as the "job end" code see p.9-10 |               |              |
| •reject                     | 2FH                       | (47)          | /            | AFH                                   | (175)         |              |
| •search (frame/chapter)     | 30H                       | (48)          | 0            | A4H                                   | (164)*11      |              |
| •section play (normal)      | 31H                       | (49)          | 1            | A4H                                   | (164)*11      |              |
| •section play*12 (fast-fwd) | 34H                       | (52)          | 4            | A4H                                   | (164)         |              |
| •section play*12 (slow—fwd) | 33H                       | (51)          | 3            | A4H                                   | (16)          |              |
| •repeat section play        | 32H                       | (50)          | 2            | A4H                                   | (164)*11      |              |
| •V. slow terminate*12       | 35H                       | (53)          | 5            | A4H                                   | (164)         |              |

\*11: If 2 FRAME is set, the code is F5H (245), if CLV is set, it is A5H (165).

\*12: Function only for the CAV.

\*2 Sub-operation status

Sub-operation statuses are mapped bitwise on a single "status byte" as follows:

|     | mode   | slow | search  | chapter display | frame display | audio R/2 | audio L/1 | CX   |
|-----|--------|------|---------|-----------------|---------------|-----------|-----------|------|
| bit | b7     | b6   | b5      | b4              | b3            | b2        | b1        | b0   |
| "1" | remote | —    | chapter | on              | on            |           |           |      |
| "0" | local* | 1/5* | frame*  | off*            | off*          | on*       | on*       | on   |
|     |        |      |         |                 |               | off       | off       | off* |

\*Shows the initial status when the player is turned on and its data is 06H (6) ACK

EX. When remote mode is specified to permit external computer control the status data is changed to 86H (134)

\*3: For the CLV, the 1st ANS is fixed to 00H. The 2nd ANS is provided with minute-clock display in binary.

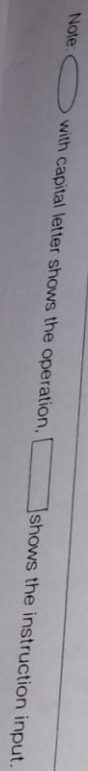
#### 4. ERROR MESSAGES

| ERROR                        | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------|-----------|--------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Format error              | 1DH       | (29)               | GS           | <ul style="list-style-type: none"> <li>*When the player receives an invalid direct instruction, it returns this code instead of "job end".</li> <li>*When the player receives an invalid instruction with variables, it returns this code instead of echoing back the "enter" code (41H).</li> <li>*If the hex value is 1DH when "pres. status" or "users code" is input, this code is not recorded on the disc (similar to Chapter).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. Incorrect operation error | 1EH       | (30)               | RS           | <ul style="list-style-type: none"> <li>*If the player is started without a disc, this code is returned instead of the "job end" of the "play-fwd" instruction.</li> <li>*If the "EJECT" button is pressed while the player is executing a prior instruction, this code is returned, and the player shifts into "Table out" mode.</li> <li>*If the "EJECT" button is pressed after completion of a prior instruction, the player returns the "table out" mode, this code is returned following the "job end" of the next direct instruction or the "echo back" of the next instruction with variables. (same sequence until the table is closed)</li> <li>*If the table is closed before the next instruction is received, "1EH" will be returned instead of a "job-end" or "echo-back" of that instruction. The instruction is not executed.</li> </ul> |
| 3. Search error-1 *1         | 3FH       | (63)               | ?            | <ul style="list-style-type: none"> <li>*When the player is instructed to "search" for an address larger than the number of addresses on the disc, this code is returned instead of "job end". The player stops in "still" mode at largest recorded frame number.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. Search error-2 *1         | 40H       | (64)               | @            | <ul style="list-style-type: none"> <li>*When the player is instructed to "search" for an address zero, which does not exist on the disc, this code is sent back instead of "job end". The player stops in "still" mode at frame number "one".</li> <li>*When the player is instructed to search for an address which can not be found because of drop outs, this code is returned instead of "job end". The player stops in "still" mode in the neighborhood of the aimed address.</li> </ul>                                                                                                                                                                                                                                                                                                                                                           |

| ERROR                      | Hex value | CODE Decimal value | ASCII symbol | COMMENT                                                                                                                                                                                                                |
|----------------------------|-----------|--------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. Hardware error          | 5FH       | (95)               |              | *When the player fails to start operation or "lead-in" because of hardware trouble, it returns this code and shifts into "park" mode.                                                                                  |
| 6. Section play error-1 *1 | 3FH       | (63)               | ?            | *When the start address of a "section play" instruction is larger than the maximum number of recorded sections, the player returns this code and stops in "still" mode at the maximum frame number on the disc.        |
| 7. Section play error-2 *1 | 60H       | (96)               |              | *When a frame number near the end address is not found because of drop-out, this code is sent back instead of "job end". The player enters "still" mode near the unfound address.                                      |
| 8. Section play error-3 *1 | 7FH       | (127)              | DEL          | *When a "section play" instruction addresses a frame whose address is larger than the maximum recorded number, this code is returned instead of "job end". The player enters "still" mode at the maximum frame number. |
| 9. Track jump-error-1      | 3FH       | (63)               | ?            | *Target address exceeds maximum recorded frame number the player will send 3FH and enter still mode at maximum frame number. (only if a JUMP instruction from "still" mode is executed.)                               |
| 10. Track jump-error-2     | 40H       | (64)               | @            | *Track jump exceeds zero address, the player will send 40H and enter still mode at address one.<br>*Target address is not found due to dropouts, the player will send 40H and enter still mode near the target address |

\*1: When errors No. 3, 4, 6, 7, and 8 occur and "mode-2" has been specified there will be no visible response from the video player. Care must be taken to program the external controller on host computer to respond properly to these errors.

## 1. INSTRUCTION/MESSAGE CODES



## 2. INSTRUCTION/MESSAGE CODES

| M L | 0 | 8   | 1 | 9 | 2        | A | 3        | B   | 4             | C | 5          | D | 6                | E | 7                   | F |
|-----|---|-----|---|---|----------|---|----------|-----|---------------|---|------------|---|------------------|---|---------------------|---|
| 0   |   |     |   |   |          |   |          | 0** | (e)           |   | FAST-0XF   |   | (g)              |   |                     |   |
| 1   |   |     |   |   | FAST-F*  |   | 1**      |     | ENTER*        |   | FAST-1/4XF |   | FAST-3XR         |   |                     |   |
| 2   |   |     |   |   | SCAN-F*  |   | 2**      |     | PLAY-R        |   | FAST-1/2XF |   | FAST-2XR         |   |                     |   |
| 3   |   |     |   |   | SLOW-F*  |   | 3**      |     | V MUTE        |   | FAST-1XF   |   | FAST-1XR         |   |                     |   |
| 4   |   |     |   |   | STILL-F* |   | 4**      |     | V SLOW-F+     |   | FAST-2XF   |   | FAST-0XF         |   | TERMINATE*          |   |
| 5   |   |     |   |   | PLAY-F*  |   | 5**      |     | V SLOW-R+     |   | FAST-3XF   |   | FAST-1XF         |   | 2 FRAME-still*      |   |
| 6   |   |     |   |   | FAST-R   |   | 6**      |     | JUMP-F+       |   | FAST-4XF   |   | FAST-2XF         |   | Users Code *        |   |
| 7   |   |     |   |   | SCAN-R * |   | 7**      |     | JUMP-R+       |   | FAST-5XF   |   | FAST-3XF         |   | Prog. Status Code * |   |
| 8   |   |     |   |   | SLOW-R   |   | 8**      |     | L/1 ON *      |   | FAST-6XF   |   | REMOTE *         |   |                     |   |
| 9   |   |     |   |   | STILL-R* |   | 9**      |     | L/1 OFF *     |   | FAST-7XF   |   | Pres. STATUS-1 * |   |                     |   |
| A   |   |     |   |   | PAUSE *  |   | FRAME*   |     | R/2 ON *      |   |            |   | Pres. STATUS-2 * |   |                     |   |
| B   |   |     |   |   | SEARCH+  |   | CX *     |     | R/2 OFF *     |   |            |   | Pres. FRAME *    |   |                     |   |
| C   |   |     |   |   | CHAPTER* |   | (JUMP-F) |     | FRAME ON *    |   | FAST-4XF   |   | Pres. CHAP *     |   |                     |   |
| D   |   | (a) |   |   | R/2 *    |   | (JUMP-R) |     | FRAME OFF *   |   | FAST-5XF   |   | LOCAL *          |   |                     |   |
| E   |   | (b) |   |   | L/1 *    |   | (ENTER)  |     | CHAPTER ON *  |   | FAST-6XF   |   | MODE-1 *         |   | MODE-3 *            |   |
| F   |   |     |   |   | REJECT * |   | (d)      |     | CHAPTER OFF * |   | (f)        |   | MODE-2 *         |   | (h)                 |   |

### 1. FAST COMMAND

50H ~ 59H: field type

5CH ~ 5EH, 61H ~ 67H: frame type

(Note) + indicates the "verb" of an instruction with variables.

- \* indicates direct instructions which may also use the "verbs" of instructions with variables.
- \*\* indicates numeric digits used in instructions with variables.
- Indicates a command applicable to the CLV.

### 2. TROUBLE STATUS

(a) FORMAT ERROR

(b) INCORRECT OPERATION ERROR

(d) SEARCH ERROR

SECTION PLAY ERROR-1

(e) SEARCH ERROR-2

(f) HARD WARE ERROR

(g) SECTION PLAY ERROR-2

(h) SECTION PLAY ERROR-3

## VI. APPENDIX

### Relationship with the VIP9500

VIP9550 has been designed as an enhanced version of VIP9500 and its feature of external computer interface is upper compatible to that of VIP9500. Following shows the main difference of interface between those two models.

#### 1. Addition of 2 FRAME STILL command

"2 FRAME STILL" plays back 2 frames (i.e. N and N+1) and jumps back 2 frames repeatedly.

##### DIRECT INSTRUCTION

\*2 FRAME STILL "75H"

Change to "2 FRAME STILL" mode from any other play-back mode.

##### INSTRUCTION with VARIABLE

2 FRAME STILL can also be obtainable after finishing the following instructions:

- \*SEARCH
- \*SECTION PLAY
- \*TERMINATE SECTION PLAY
- \*REPEAT SECTION PLAY
- \*TERMINATE REPEAT SECTION PLAY

Add 2 FRAME STILL "75H" after FRAME "3AH" which appears in the command.

#### 2. Addition of "STATUS REQUEST" command

Following instructions are provided in order to cope with NEW DISC SPEC.

| INSTRUCTION             | INST. CODE | ECHO BACK | 1st ANS.            | 2nd ANS. |
|-------------------------|------------|-----------|---------------------|----------|
| USERS CODE*             | 76H        | 76H       | X1 & X3             | X4 & X5  |
| PROGRAM STATUS*<br>CODE | 77H        | 77H       | D & X3 or<br>B & X3 | X4 & X5  |

USERS CODE... 8, X1, D, X3, X4, X5 (24 bits)

PROGRAM STATUS CODE... 8,  $\frac{DC}{BA}$ , X3, X4, X5 (24 bits)

#### 3. Deletion

- \*Deletion of 1/10 slow speed playback which used to be performed by "23H" and "28H".
- \*Deletion of FOCUS ERROR MESSAGE.



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