VG-848 (RB-1848)

Instruction Manual

Ver 2.4

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ASTRODESIGN, Inc.

CONTENTS

1 Before Operation

1.1. Foreword

Thank you for purchasing the model VG-848 video signal generator.

This manual provides details on how to operate the VG-848 using the RB-1848 and the precautions to be heeded when doing so. Take the time to read through this manual before attempting to operate the VG-848.

After reading through the manual, keep it in a safe place for future reference.

1.2. Safety precautions

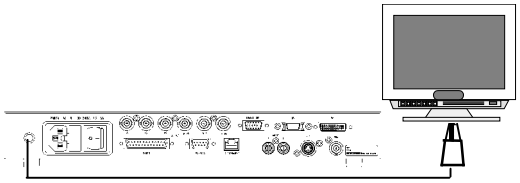
Since improper handling may lead to accidents, we recommend that you take the time to read through the following warning and precaution information without fail before attempting to operate the VG-848: the information provided will ensure that you will operate the VG-848 properly.

■ Meaning of the symbols used in this manual

⚠ **WARNING**	"WARNING" denotes a potentially hazardous situation caused by improper handling of the generator which may possibly result in serious bodily injury (including death) and/or impairment of the generator's original functions.
⚠ **CAUTION**	"CAUTION" denotes a potentially hazardous situation caused by improper handling of the generator which may possibly result in injury, impairment of the generator's original functions and/or damage to personal property.
⊘	" ⊘ " denotes an action or behavior which is prohibited (which must not occur). Specific details are provided by the picture or text near " ⊘ ."
❗	" ❗ " indicates an action or behavior which must be engaged in or instructed to engage in. Specific details are provided by the picture or text near " ❗ ."

■ What to do and not to do to ensure safe operation

⚠ **WARNING**	Always take hold of the molded part of the plug when disconnecting the power cable.	❗
	Do not place heavy objects on top of the power cable. This may damage the cable, causing a fire or electrical shock.	⊘
	Do not use force to bend the power cable or bundle it with other cables for use. This may cause a fire.	⊘
	Do not spill liquids inside the generator or drop inflammable objects or metal parts into it. Operating the generator under these conditions may cause a fire, electrical shock or malfunctioning.	⊘

⚠ CAUTION		
	Install the generator in a stable location. Do not stand it on its side. Otherwise, the rise in the internal temperature resulting from the heat generated may cause malfunctioning.	❗
	Do not subject the generator to impact since this may cause malfunctioning. Take special care when moving the generator.	⊘
	Before connecting the VG-848 to the display, connect the frame grounds (FG) on both the VG-848 and display using the accessory FG cable. If the frame grounds are not connected, the output DAC and other extremely costly parts of the VG-848 will be susceptible to damage. Taking this precaution is particularly important in the case of displays which are being developed.  Connect to the frame ground on the VG-848. Use a crocodile clip for the connection to the frame ground on the display.	❗
	When disconnecting the VG-848 from the display, first disconnect the connecting cables before disconnect the FG cable.	❗
	When turning the power ON and OFF, be absolutely sure to use the POWER switch on the generator's rear panel. Connecting or disconnecting the power cable to turn the power on or off may damage the PC card.	❗
	When accuracy has a high priority, wait for the operation of the VG-848 to stabilize, a process which takes about 10 to 15 minutes, by leaving its power on before proceeding with operation.	❗
	In the unlikely event that trouble or malfunctioning should occur, first disconnect the power cable, and then contact your dealer or an Astrodesign sales representative.	❗

1.3. How this manual is organized

This instruction manual is for operating the VG-848 using the RB-1848. Organized in the manner set forth below, the manual describes the operation methods, precautions, etc. Read it through carefully since the information provided will ensure that you will operate the VG-848 properly.

1 Before operation

This chapter describes what safety precautions are to be observed, how the manual is organized, and what accessories are packed with the generator.

2 Concerning the VG-848 (RB-1848)

This chapter provides general details on the VG-848.

3 Concerning PC cards

This chapter provides general details on the PC cards.

4 VG-848 generator settings

This chapter describes the settings of the VG-848.

5 Signal output and data registration methods

This chapter describes the functions of the VG-848.

6 Timing data configuration and setting procedures

This chapter provides general details on the timing data and describes their setting methods.

7 Pattern data types and setting procedures

This chapter provides general details on the pattern data and describes their setting methods.

8 How to operate the VG-848 by remote control

This chapter describes the remote control operations performed using the RB-614C and RB-649.

9 Outline of self-check function and execution procedure

This chapter provides general details on the self-check function and describes its execution procedure.

10 Appendices

This chapter provides the user with supplementary information.

1.4. Accessories packed with the VG-848

The VG-848 comes with the following accessory items. Be absolutely sure to use these items since use of other items may cause malfunctioning or trouble.

■ Standard accessories

- VG-848 video signal generator
- VG-848 (RB-1848) instruction manual (what you are reading) ... 1 copy
- CompactFlash (CF) card (64MB) ... 1 pc
- PC card adapter for CompactFlash card ... 1 pc
- PC card case ... 1 pc
- SP-8848 software program instllation CD (for Windows) ... 1 pc
- SP-8848 software program operation manual (PDF file) ... 1 copy
  (saved in a SP-8848 software program instllation CD.)
- Power cable ... 1 pc (*1)
- FG cable (1.5 meters long) ... 1 pc (*1)

*1: These cables are designed to be used with the VG-848 only.

■ Optional accessories

- RB-1848: Remote control box for the VG series
- RB-614C: Remote control box for the VG series (*1)

  Connecting one of these boxes to the VG-848 enables program numbers to be called, character, dot, crosshatch and other pattern data to be turned ON and OFF, and the RGB signals to be turned ON and OFF.
- RB-649: Remote control box for the VG series (*2)

*1: In addition to the VG-848, the RB-614C box can also be used to control the VG-812, 813, 814, 815, 819, 822, 823, 827, 833, 829, 851, 856, 825, 826A and 852.

*2: In addition to the VG-848, the RB-649 box can also be used to control the VG-822, 823, 827, 826A, 851, 852 and 856.

2 Concerning the VG-848 (RB-1848)

2.1. Introduction

The VG-848 is a video signal generator for being used in various fields of display testing and measurement. In addition to delivering RGB analog outputs and low-voltage serial digital (panel link) outputs as well as NTSC, PAL and SECAM outputs, its analog outputs support color difference signals and tri-level sync signals.

The generator is also capable of full-color bitmap displays with up to 16.77 million colors. Its output signals which support CRTs, LCDs, PDPs and other kinds of display units enable the generator to be used in a wide range of activities for video-related equipment including the development of technology, applications on production lines, inspections and maintenance operations.

The time data, pattern data and other outputs can be easily set using the SP-8848 and RB-1848. It is also possible for users to create their own special patterns and register natural images.

2.2. Features

■ All-in-one model

This generator houses a full complement of output facilities including analog outputs and serial digital outputs as well as NTSC, PAL and SECAM outputs in a compact body without the need for adapters, etc.

■ Wide frequency range for dot clock signals

The VG-848 supports the 5 to 300 MHz frequency range for analog outputs and the 25 to 300 MHz range for digital outputs for its dot clock signals.

■ Support for full-color output

This generator is capable of full-color displays using 16.77 million colors.

■ Special pattern preparation function

Over and above the existing basic patterns (11 patterns including character, crosshatch, color bar and gray scale) and the special patterns (up to 64 patterns of which can be incorporated), this new function enables special patterns to be created exactly as desired by the users. The function serves as a powerful ally in developing and evaluating next-generation displays and in creating special patterns which are useful for automatic machines.

■ PC cards used to store program data

In addition to the conventional memory cards, PC cards (CompactFlash cards with PC card adapter) are supported. A total of 849 sets of program data can be registered on each PC card. Computer screen displays and natural images can also be stored. With notebook computers and other types of personal computers equipped with a PC card slot, data can be copied using Explorer in Windows 98SE or Windows XP.

■ Internal sample data

A total of 150 kinds of timing data and 150 kinds of pattern data are entered as sample data inside the VG-848. They can be combined in any way for outputting signals. This function comes in handy when a PC card is not going to be used. It also makes it possible to use the sample data when program data is to be edited.

■ Editing and registration software program (SP-8848) compatible with Windows provided as a standard accessory

Program data can be edited and registered and signals can be output using Windows.

■ LAN support provided

Program data stored on PC cards can be edited directly from a personal computer which has been connected to a LAN or the RS-232C connector.

2.3. Main differences from existing models

The main differences between the VG-848 and existing models (VG-828/VG-828D) are listed in the table below.

Table 2.3.1 Main differences from VG-828 and VG-828D

Item	VG-828/VG-828D	VG-848
User characters	E0 to E7 (these differ by panel ROM type). Selection of E0 to FF patterns (memory card).	Selection of E0 to FF patterns (PC card). (Refer to "User character data" in 10.1.3.) *) The panel ROM is not installed.
Remote control box	Editing is not possible using the RB-614C or RB-649.	Editing is not possible using the RB-614C or RB-649. Editing is possible using the RB-1848 (used exclusively with the VG-848).
TTL output (R/G/B, RH/GH/BH)	Not supported. This facility can be set in the program data to ensure compatibility with an existing model but the setting will be ignored when it is executed.	Not supported. (No setting item provided by VG-848)
NRZ/RZ	Not supported. This facility can be set in the program data to ensure compatibility with an existing model but the setting will be ignored when the it is executed.	Not supported. (No setting item provided by VG-848)
External control (*1)	RS-232C/USB connection *1	RS-232C/LAN connection The facility is set using the config edit function. (Refer to Chapter 4 entitled "VG-848 generator settings.") The RS-232C baud rate and other parameters can also be set.

*1 The terminal command expanded for the VG-848 cannot be used.

2.4. Abbreviations used

The main abbreviations used by the VG-848 are listed below.

■ Abbreviations related to output signals

Table 2.4.1 Abbreviations related to output signals

Abbreviations	Meaning
HS	Horizontal sync signal
VS	Vertical sync signal
CS	Composite sync signal
RHT, GHT, BHT	Red, green, blue half-tone
CLK	Dot clock
EQP (EQ-PULSE)	Equalizing pulse
SERR	Serrated pulse
CV	Composite video sync signal

■ Abbreviations related to operation

Table 2.4.2 Abbreviations related to operation

Abbreviations	Meaning
PROG	Program
PAT SEL	Pattern select
OUTPUT	Output condition
PAT	Pattern
FUNC	Function

2.5. Panel parts and their functions

The key functions differ from one function to function and from one mode to another. For details, refer to the operation instructions provided in the chapters.

2.5.1. VG-848 front panel

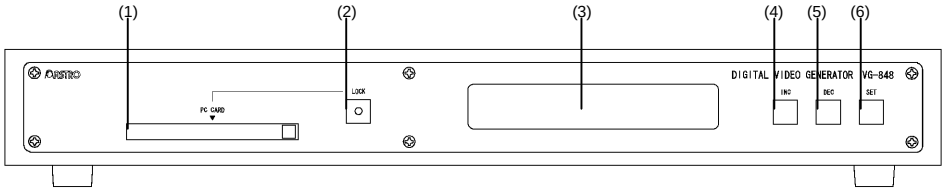


Fig. 2.5.1 Front panel

(1) PC card slot: Insert the PC card here. To eject it, press the EJECT button on the right of the slot.

CAUTION

Always handle the PC cards very carefully. When inserting or ejecting a PC card, follow the steps in "How to insert the PC card" in 3.2.3 and "How to eject the PC card" in 3.2.4.
If the wrong steps are taken, the data on the PC card may be damaged.
Also, the PC card may no longer be recognized even when it is re-inserted.

(2) [LOCK] button: Press this to release the lock before ejecting the PC card. While the lock is engaged, the LED is lighted; when it is released, the LED goes off.

(3) LCD: The menu set, program number, timing data, etc. appear here. Two lines each containing 24 characters are displayed.

(4) [INC] key: This increments the program numbers or group number by 1 (+1).

(5) [DEC] key: This decrements the program numbers or group number by 1 (-1).

(6) SET key: This is used to execute the program data which has been selected by the (4) and (5) keys

Point

When the RB-1848, RB-614C or RB-649 is used, programs are executed simply by pressing the [INC] or [DEC] key. However, If the [INC] key or [DEC] key on the front panel of the VG-848 is used, however, the programs are not executed until the [SET] key is pressed after pressing the [INC] or [DEC] key.

2.5.2. VG-848 rear panel

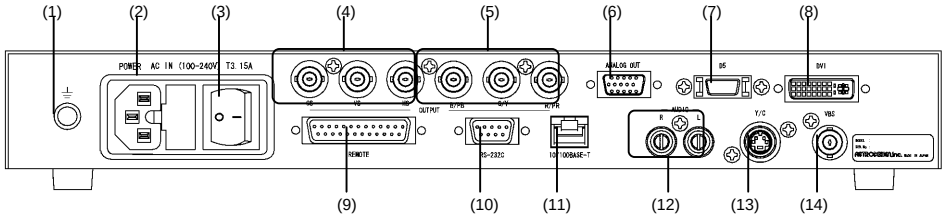


Fig. 2.5.2 Rear panel

(1) Frame ground (FG): Connect this frame ground to the frame ground of the unit which is connected to the VG-848.

(2) AC input socket: One end of the power cable is connected here. A voltage from 100V to 120V or 200V to 240V is supported.

(3) POWER switch: This is used to turn the power ON and OFF.

CAUTION

The POWER switch must always be used to turn the generator's power on and off. Turning the power on and off by plugging in and unplugging the AC power cable may damage the PC card.

(4) BNC analog output connectors: HS = Horizontal sync signal, VS = vertical sync signal, CS = composite sync signal.

(5) BNC analog output connectors: The RGB or YPbPr video signals are output from these connectors.

(6) D-SUB 15-pin (mini) analog output connector

(7) D connector: Video signals complying with the D5 standard format are output from this connector. RGB signals are output while the [YPbPr] button LED on the RB-1848 is off. (The LED is ON for YPbPr output signals only with internal programs.)

(8) DVI digital serial connector (CH1): (The analog rated value is OFF.)

(9) Remote connector (25-pin female): This is used to connect an optional remote control box (RB-1848, RB-649 or RB-614C) to operate the generator by remote control.

(10) RS-232C connector (9-pin female): This is used to connect a personal computer using the RS-232C cable.

(11) Ethernet port (10/100BASE-TX): This port is used for connection to a LAN using the Ethernet cable.

(12) AUDIO output connectors: The audio signals are output from these connectors. Settings from 100 Hz to 20 kHz are possible.

(13) NTSC/PAL/SECAM Y/C video output connector.

(14) NTSC/PAL/SECAM VBS composite video output connector.

2.5.3. RB-1848

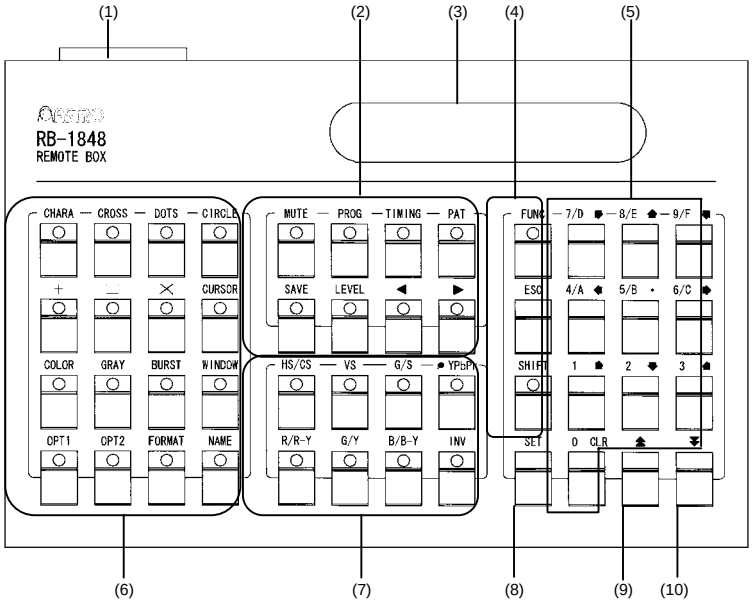


Fig. 2.5.3 RB-1848

(1) VG series connector: This is used to connect the RB-1848 to the VG series.

(2) These keys are used to execute and edit the program data. When a key is selected, its LED lights.

(3) LCD: The menu set, program number, timing data, etc. appear here. Two lines each containing 24 characters are displayed.

(4) These keys are used to execute and abort the functions and program data and to select the input signals.

(5) Number keys: These keys are used to input the data. When one of these keys is used together with the [SHIFT] key, hexadecimal values containing letters A to F can also be input.

(6) Pattern keys: These keys are used to select the patterns and output signals. When a key is selected, its LED lights.

(7) Output control keys: These keys are used to select the output signals. When a key is selected, its LED lights.

(8) [SET] key: This key is used to execute the functions and program data.

(9) [INC] key: This is used to increment the program numbers (+1) and display the previous page on the LCD.

(10) [DEC] key: This is used to decrement the program numbers (-1) and display the next page on the LCD.

Point

In the direct display mode, a program is executed immediately after the [INC] or [DEC] key is pressed on the RB-1848.

2.6. Operating modes

The operating mode can be selected by setting the VG-848's power to ON while holding down one of the keys below.

Table 2.6.1 Operating modes

Key operation	Operation mode
When the power is turned on	The VG-848 starts up in the normal mode. The direct display mode or group display mode is established. (Refer to "Output of video signals (direct display)" in 5.2 and "Automatic output of video signals (auto display) in 5.3.)
When the power is turned on while the SET key is held down	The VG-848 starts up in the auto display mode. The program data on the PC card registered by the config edit function (refer to Chapter 4 entitled "VG-848 generator settings") is executed.
When the power is turned on while the [INC] key is held down	The VG-848 starts up in the self-check mode.

*1 : Hold the key down for about two seconds after the power is turned on.

2.7. Concerning the internal data

The following data is contained in the E-PROM inside the main unit of the VG-848. (Refer to "Internal data" in 10.1.)

Table 2.7.1 Internal data

Data	Number of data (program No.)
Number of program data	150 (850 to 999)
Number of user characters	16 (F0H to FFH)
Number of optional patterns	64 (00H to 3FH)

This data can be used for output or for copying onto the PC card. The data in a program is divided into the following blocks.

Table 2.7.2 Program data blocks

Block		General description
Valid/invalid		Denotes whether the program data is valid or invalid.
Timing data	H-Timing	Horizontal timing data
	V-Timing	Vertical timing data
	OUTPUT	Output condition data
	AUDIO	Audio output data
Pattern data	Pattern Select	Pattern select data
	Graphic Color	Graphic color data
	CHARA	Character pattern data
	CROSS	Crosshatch pattern data
	DOTS	Dot pattern data
	CIRCLE	Circle pattern data

Block	General description	Block
Pattern data	COLOR	Color bar pattern data
	GRAY	Gray scale pattern data
	BURST	Burst pattern data
	WINDOW	Window pattern data
	OPT1	Optional pattern #1 data
	OPT2	Optional pattern #2 data
	CURSOR	Cursor pattern data
	NAME	Program name data
	ACTION	Pattern action data

When this data appears on the LCD, it is divided into a multiple number of pages to match the screen size. To display the data on the next page, press the [DEC] key; to display the data on the previous page, press the [INC] key. To select an item on a page, use the [◀] or [▶] key to move the cursor to that item.

Caution

If all the data is contained on one page, the display remains unchanged even when the [DEC] key or [INC] key is pressed, If there is only one item, the cursor does not move.

2.8. Concerning the cursor movements on the LCD display

Not only is the program data being output displayed on the LCD but the setting items also appear during data editing. To set a data item, move the cursor by operating the keys listed **below, and input the setting using the number keys.**

Table 2.8.1 Cursor movements on the LCD display

Key	Operation
[▶] key	Used to move the cursor to the next item.
[▶] key	Used to move the cursor to the previous item.
[INC] key	Used to display the previous page.
[DEC] key	Used to display the next page.

3 Concerning PC cards

3.1. Outline

The data inside the VG-848 cannot be edited. However, data can be edited after it has been copied onto a PC card. Users can generate any timing data or pattern data.

Program data, group data, user characters and auto display data as well as user-generated optional pattern data and image data can be registered and edited on the PC cards.

3.2. PC cards which can be used

3.2.1. Types

Given below are the PC cards (CompactFlash cards) and the PC card adapter which have already been verified as working with the VG-848.

- PC card (64MB) provided as a standard accessory SDCFB-64-760MP

  Compact flash card made by Mitsubishi Plastics, Inc. (Sun Disk).
- PC card adapter provided as a standard accessoryNS0000CMNNXXXX

Caution

PC cards come with a number of different specifications. As such, when a card whose operation has not been verified is used, its read/write operations may be unstable or it may fail to operate at all.

3.2.2. Number of data which can be registered

Shown below is the number of data which can be registered on the PC card.

Table 3.2.1 Number of data which can be registered

	Number of data
Number of programs which can be registered (program no.)	849 (1 to 849)
Number of characters in a program name	20 characters
Number of user characters which can be registered (character codes)	16 (E0H to EFH)
Number of groups which can be registered (group number)	99 (1 to 99)
Number of characters in a group name	20 characters
Number of user-generated optional patterns which can be registered (optional pattern no.)	64 (40H to 7FH)
Number of image data which can be registered	Depends on card capacity.

3.2.3. How to insert the PC card

(1) Insert the PC card into the slot in the direction indicated by the arrow on the card's top surface.

Insert the card firmly as far as it will go.

A beep tone is heard.

The LED lights → Check that the card is locked in position.

If the card is locked properly, a beep tone is heard.

3.2.4. How to eject the PC card

(1) Press the [LOCK] key.

A beep tone is heard.

(2) Lightly press the EJECT button to the right of the card slot.

The EJECT button pops out.

(3) Forcefully press the EJECT button to eject the card.

Check that the lock is released and LED goes off.

If the card is unlocked properly, a beep tone is heard.

Point

It takes two or three seconds for the LED to go off after the EJECT button is pressed and the card is ejected.
This is due to the time taken by the processing of the PC card ejection inside the VG.
Refrain from performing any operations during these seconds.

CAUTION

Be absolutely sure to follow the above steps to insert and eject PC cards.
Taking any other steps may damage the data on the PC card and make it impossible for the PC card to be recognized even when it is re-inserted.

4 VG-848 generator settings

4.1. Setting method of VG-848 generator

The VG-848 generator settings are listed in the table below.

Table 4.1 VG-848 generator settings

No.	Item	Description
1	Group number	For selecting the number of the group displayed in the group display mode.
2	Beep tone	For selecting whether to sound the beep tone.
3	Pattern display mode	For selecting a single pattern or multi pattern.
4	Terminal mode	For selecting the external control interface (RS-232C/LAN).
5	Data mode	For selecting the format for the output conditions of the program data.
6	Baud rate/data bits	For selecting the RS-232C baud rate and data bits.
7	Parity bit/stop bit	For selecting the RS-232C parity bit and stop bits.
8	Execution program	For selecting the program to be executed when the power is turned on.
9	DDC pattern	For selecting whether to enable or disable the DDC optional patterns.
10	IP address/port no.	For setting the IP address and port number of the LAN.
11	Priority mode	For selecting the drawing mode when patterns are switched.
12	License key	For inputting the license key to make the optional function available..
13	VBS level fine adjustment	For finely adjusting the VBS output level.
14	Video level fine adjustment	For finely adjusting the video output level.
15	DVI level mode	For selecting the DVI level either 0 to 255 or 16 to235.
16	Key lock for preventing incorrect operation	For selecting the lock mode for preventing incorrect operation of LEVEL key and FUNC key.
17	Display when using the terminal mode.	For selecting the display item when the terminal mode is used.
18	Tri level signal	For selection either to make tri-level signal regular mode or compatible mode.
19	VBS output fileter .	Set the VBS output filter.
20	DDC transmission clock setting changed	The clock during DDC is set.
21	RB-614C H-T key setting	This is for setting the H-T key of the RB-614C to function as the GROUP or CURSOR key.
22	Dot setting when drawing one pixel	This is for setting one or two dots for drawing one pixel with TV timing data.

(1) Press the [FUNC] key, [5] key and [SET] key.

```
Select Function : 5 (0-E)
Config Edit
```

Fig. 4.1.1 Selecting the function

Use the [INC] key and [DEC] key to switch the menu.

(2) Select the group number (0 to 99).

Point

When "0" is selected, the data is output in the direct display mode. (Refer to "Direct output (direct display mode)" in 5.2.1.) When a number other than "0" is selected, the corresponding group number is output in the group display mode. (Refer to "Group data output (group display mode)" in 5.2.2.)

```
Cfg:Group No: 0   (00-99)
```

Fig. 4.1.2 Selecting the group number

(3) Select ON or OFF for the beep tone.

```
Cfg:Beep   :ON (0/1)
```

Fig. 4.1.3 Selecting the beep tone

Table 4.1.1 Selection method

Key	General description
0	The beep tone is sounded. (Factory setting)
1	The beep tone is not sounded.

(4) Select the pattern display mode (Disp Mode).

```
Cfg:Disp Mode :0   (0/1)
Single Pattern
```

Fig. 4.1.4 Selecting the pattern display mode

Table 4.1.2 Selection method

Key	LCD display	General description
0	Single Pattern	Only one pattern can be selected when switching patterns using the pattern keys on the RB-1848. (Example: If the [CROSS] key is selected when the [CHARA] key has been selected, the [CHARA] key selection is released.)
1	Multi Pattern	This is the factory setting. A multiple number of patterns can be selected when switching patterns using the pattern keys on the RB-1848. (Example: If the [CROSS] key is selected when the [CHARA] key has been selected, both patterns appear together on the display.)

(5) Select the terminal mode (Term Mode).

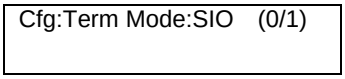


Fig. 4.1.5 Selecting the output condition data

Table 4.1.3 Selection method

Key	LCD display	General description
0	SIO	The external control of the VG-848 is set to RS-232C. (Factory setting)
1	LAN	The external control of the VG-848 is set to LAN.
2	BOTH	Response according to the received port. (If received throught the serial port, responses through, serial. If received through LAN port, reponses through LAN port) Please do not use this function usually.

Point

When the VG-848 is to be controlled using the accessory Windows software program (SP-8848), the same setting must be selected as the one chosen for the PC in which SP-8848 has been installed.

Caution

The settings must be saved and the system restarted when the terminal mode has been changed. (The settings are not reflected by the act of saving them alone. They will take effect only when the system is next started up.)

(6) Select the output condition data (MemCard Mode) for the program data on the PC card.

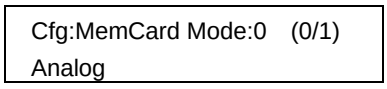


Fig. 4.1.6 Selecting the output condition data

Table 4.1.4 Selection method

Key	LCD display	General description
0	Analog	The analog-only items are set as per the data on the PC card. (Factory setting)
1	Digital	The analog output conditions are set to the initial values.

Shown below is the analog-only output condition data which is initialized when "Digital" is selected.

Table 4.1.5 Analog-only output condition data

Item	Initial value
Video	0.70(V)
Setup	0.00(V)
Sync	0.30(V)
RGB/YPbPr	RGB
YPbPr No.	0

(7) Select the RS-232C baud rate (RS-Speed).

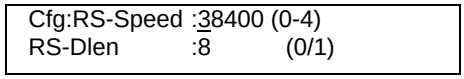


Fig. 4.1.7 Selecting the baud rate

Table 4.1.7 Baud rate selection

Key	LCD display	General description
0	9600	The baud rate is set to 9600 bps.
1	19200	The baud rate is set to 19200 bps.
2	38400	The baud rate is set to 38400 bps. (Factory setting)
3	57600	The baud rate is set to 57600 bps.
4	115200	The baud rate is set to 115200 bps.

(8) Select the RS-232C data bits (RS-Dien)

Table 4.1.8 Data bit selection

Key	LCD display	General description
0	7	7 bits are set as the data bits.
1	8	8 bits are set as the data bits. (Factory setting)

(9) Select the RS-232C parity (RS-Parity).

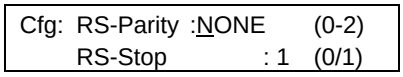


Fig. 4.1.8 Selecting the parity

Table 4.1.9 Selection method

Key	LCD display	General description
0	NONE	"None" is selected as the parity. (Factory setting)
1	EVEN	"Even" is selected as the parity.
2	ODD	"Odd" is selected as the parity.

(10) Select the RS-232C stop bit (RS-Stop).

Table 4.1.10 Stop bit selection

Key	LCD display	General description
0	1	1 bit is selected as the stop bit. (Factory setting)
1	2	2 bits are selected as the stop bit.

(11) Select the numbers of the programs to be executed (Start Prg No) when the power is turned on.

Use the number keys to input the number of the timing data program, press the **[>]** key, and input the number of the pattern data program using the number key.

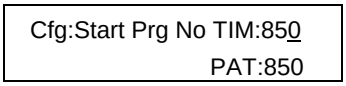


Fig. 4.1.9 Selecting numbers of programs to be executed

Point

When the power is turned on and the direct display mode has started up, the programs whose numbers are set here will be executed. If no program data is to be output when the power is turned on, set "0" as each program number. (Factory setting: "0" for both program numbers)

(12) Select the DDC optional pattern port (#0E).

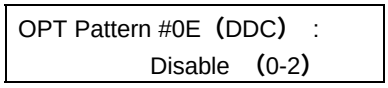


Fig. 4.1.10 Selecting the DDC optional pattern

Table 4.1.11 Selection method

Key	LCD display	General description
0	Disable	Disabled. (Factory setting)
1	DVI	The DVI mode is established.
2	D-SUB	The D-SUB mode is established.

Point

When optional pattern #0E is executed, the DDC data is captured from the display connected to the serial output connector, for example, and displayed. If the data capture is unsuccessful at this time, no further operations can be performed for about 30 seconds since another attempt will be made to capture the data.
When "Disable" is selected, the DDC data is not captured, and no patterns are displayed. Select this setting when the unit connected does not support DDC.

(13) Set the IP address and port number.

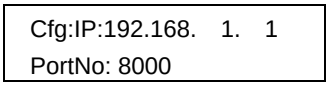


Fig. 4.1.11 Setting the IP address and port number

Table 4.1.12 Selection method

Setting item	Key operation	General description
IP	Number keys	Use these keys to set the IP address of the VG-848. Setting range: 0.0.0.0 to 255.255.255.255
PortNo	Number keys	Use these keys to set the number of the port on the VG-848 to be used for receiving data. 1024 to 65535

Point

- The same IP address and port number settings as the configuration settings of the accessory software program (SP-8848) must be selected.
- The IP address of the device connected to the VG-848 should be in the same network address of the IP address of the VG-848.
- The IP address of the VG-848 supports Class A, B and C. It also supports the Class D, however, it is for the special usage of multi cast communication. Please do not use it.

Caution

- The settings must be saved and the system restarted when the IP address or port number has been changed. (The settings are not reflected by the act of saving them alone. They will take effect only when the system is next started up.)
- Please do not turn off the power before the LED of the “SAVE” key lights off. Otherwise, it may lead to a trouble.

Concerning the general IP address settings

IP addresses fall into two categories, global addresses which are allocated to computers connected to the Internet and private addresses which are used by LANs, etc.

Depending on the IP address, the following conventions apply to the private addresses used for LANs.

Class A (10.0.0.0 to 10.255.255.255)
The number used for the 3-digit number in the first block is always "10," and it is followed by combinations of numbers from 0 to 255. Use of this class of IP address enables up to 16 million computers to be connected by a single network.

Class B (172.16.0.0 to 172.31.255.255)
The number used for the 3-digit number in the first block is always "172," and numbers from 16 to 31 are used for the 3-digit number in the second block. Use of this class of IP address enables up to 65,534 computers to be connected by a single network.

Class C (192.168.0.0 to 192.168.255.255)
The numbers used for the 3-digit number in the first two blocks are always "192.168," and numbers from 0 to 255 are used for the 3-digit number in the third block.

Numbers "0," "1" and "255" are not normally allocated as the 3-digit number in the fourth block.

Use of this class of IP address enables up to 256 computers to be connected by a single network.

The IP addresses in class C are used to configure a LAN in an environment such as a small-scale office.

(14) Input the license key which makes the optional function available.

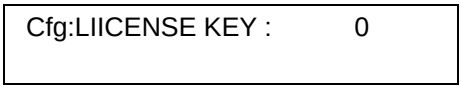


Fig. 4.1.12 Inputting the HDCP license key

Table 4.1.13 Selection method

Key operation	General description
Number keys	Input the 7-digit figure using the number keys.

CAUTION When the license key has been input, restart the VG generator. After the generator has been restarted, the license key is enabled.

(15) Finely adjust the VBS output level.

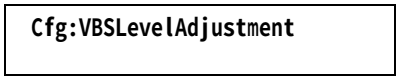


Fig. 4.1.13 VBS output level adjustment page

● How to adjust the VBS output level

Point

- The calibrated VBS output signal is made further fine-adjustment here. (Refer to 5.12 How to set and execyte calibration.)
- The unit has already been calibrated when ex-factory.

(1) The VBS output level fine adjustment mode is established by pressing the [LEVEL] key while the page shown above is displayed. The [LEVEL] key LED now lights.

(2) The output level can be increased using the [▲] key and reduced using the [▼] key. The adjustment range extends from approx. 600mV to 1600mV.

Use oscilloscope when confirming the adjustment range.

(3) The fine adjustment mode can be exited by pressing the [LEVEL] key again. The [LEVEL] key LED now goes off.

(4) To reflect the results of the fine adjustment, press the [SAVE] key to save the data.

Caution

- Please do not turn off the power before the LED of the “SAVE” key lights off. Otherwise, it may lead to a trouble.

(16) Finely adjust the video output level.

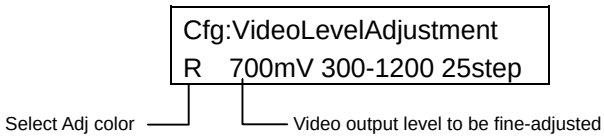


Fig. 4.1.14 Video output level adjustment page

Table 4.1.14 Adjustment color selection

Key	LCD display	General description
0	R	The adjustment color is set to red.
1	G	The adjustment color is set to green.
2	B	The adjustment color is set to blue.

● Selection of level and color of video output to be fine-adjusted.

Set video color and output level to be adjusted in the Fig. 4.1.15.

The adjustment level ranges from 300mV to 1200mV, and it can be set in 25mV increments. Use the number keys to set the level directly. If set the fractions not divisible by 25 are omit. (e.g. 724mV → 700mV)

●How to adjust the video output level

①The fine adjustment mode is established by pressing the [LEVEL] key. The [LEVEL] key LED now lights.

②The output level can be increased using the [▲] key and reduced using the [▼] key. The adjustment range extends from approx. -25mV to approx. +25mV as seen from the set level.

③When the fine adjustments have been completed or when the mode is to be exited, press the [LEVEL] key again. The [LEVEL] key LED now goes off.

④Repeat steps ① to ③ to adjust another color and level. Upon completion of all the fine adjustments, all the finely adjusted data is reflected by pressing the [SAVE] key to save the data.

Caution

- Please do not turn off the power before the LED of the "SAVE" key lights off. Otherwise, it may lead to a trouble.

(17) Select the DVI level mode

Fig. 4-1-15 Select the DVI level mode

Table 4-1-15 How to select

Key	LCD display	Details
0	0 to 255	Output level from 0 to 255 without converting DVI level.
1	16 to 235	Output level from 16 to 235 converting DVI level.

(18) Select the key lock mode to prevent incorrect operation

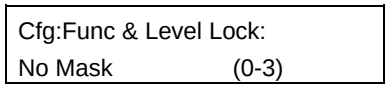


Fig. 4-1-16 Lock mode selection

Table 4-1-16 How to select

Key	LCD display	Details
0	No Mask	Release the operation lock of [FUNC] and [LEVEL] key.
1	Level key Lock	Operation lock of [LEVEL] key. ([LEVEL] key operaion lock mode of direct display execution.)
2	Func Lock	Edit lock mode of [FUNC] key. (edit lock mode of FUNC1 to 4, 6 to D)
3	Func & Level Lock	Lock mode of [FUNC] and [LEVEL] key.

(19) Select the display when using the terminal mode

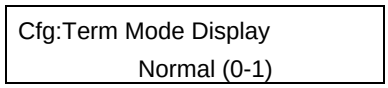


Fig. 4-1-17 Select the terminal mode display

Table 4-1-17 How to select

Key	LCD display	Details
0	Normal	No display for the terminal mode.
1	Display	“T” is displayed at the right top of the LED when using the terminal mode.

(20) Select the tri-level signal

Cfg:Tri Sync Mode :Normal (0/1)

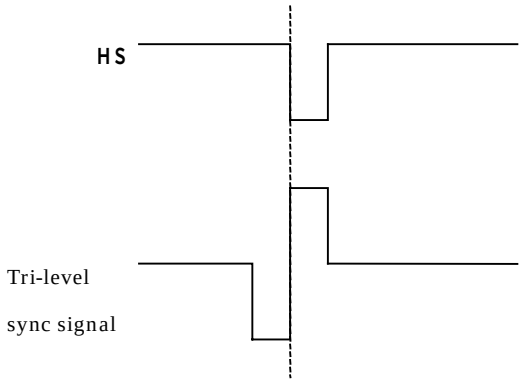
Fig. 4-1-18 Select the tri-level signal

Tbale 4-1-18 How to select

Key	LCD display	Details
0	NORMAL	Tri-level signal regular mode
1	SHIFT	Tri-level signal convertible mode.

• What is tri-level signal sync mode

When using VG-848, the tri-level sync signal output such as 1080i timing (refer to 6.4 Analog output condition data setting), the relation of tri-level sync signal and Hsync is shown as Fig. 4-1-19. (normal mode) When using the previous model, such as VG-828/828D, it is output shown as Fig. 4-1-20.



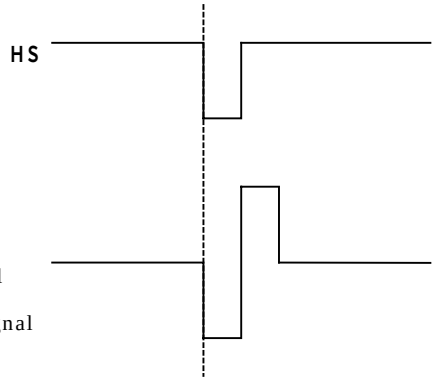


Fig. 4-1-19 Sync signal of VG-848(Normal mode) **Fig. 4-1-20 Sync signal of previsou models**

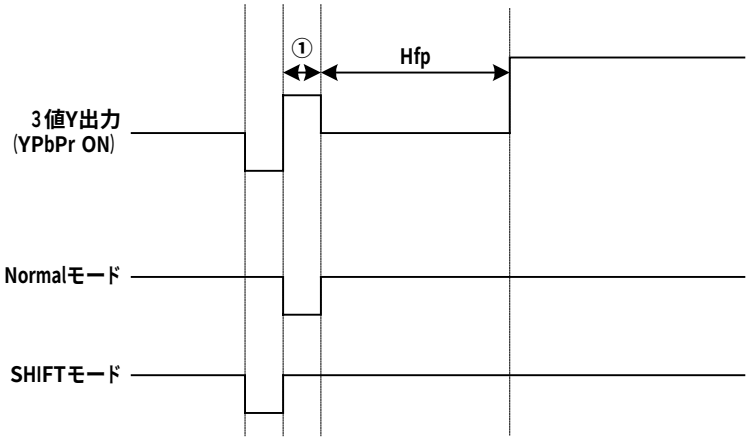


Fig. 4-1-21 Comparison of normal mode and SHIFT mode

Caution

• Even when using SHIFT mode, the Hfp is same as normal mode.
• If the timing data is read from the previous model in SHIFT mode, the Hfp becomes the the value of Hfp – (1) that is set in the previous models.

(21) Set the VBS output filter.

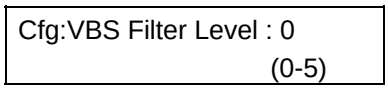


Fig. 4-1-22 Select VBS filter

Table 4-1-19 How to select

Key	General description
0 to 5	Change the level from 0 (the weakest) to 5 (the strongest). The factory setting is 4.

(22) DDC transmission clock setting changed

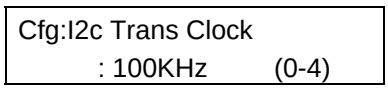


Fig. 4.1.23 Select DDC transmission clock

Table 4.1.20 How to select

Key	LCD display	General description
0	20KHz	Set clock speed as 20KHz.
1	40KHz	Set clock speed as 40KHz.
2	60KHz	Set clock speed as 60KHz.
3	80KHz	Set clock speed as 80KHz. (factory setting)
4	100KHz	Set clock speed as 100KHz.

(23) Selecting the H-T key of RB-614

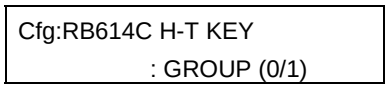


Fig. 4-1-24 Setting the H-T key to function as the GROUP or CURSOR key

Table 4-1-21 Setting method

Key	LCD Display	Description
0	GROUP	The H-T key of the RB-614 is made to function as the GROUP key.
1	CURSOR	The H-T key of the RB-614 is made to function as the CURSOR key.

(24) Dot setting for drawing one pixel with TV timing (NTSC, PAL, SECAM) data

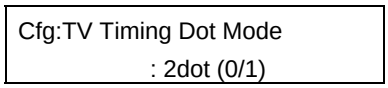


Fig. 4-1-25 Selecting the drawing dot or dots

Table 4-1-22 Selection method

Key	LCD Display	Description
0	2dot	Two dots are used to draw one pixel. (Factory setting)
1	1dot	One dot is used to draw one pixel.

Caution

This setting is reflected when the CROSS, DOTS, CIRCLE, +,□ or X patterns are drawn.

(25) Selecting the internal program table

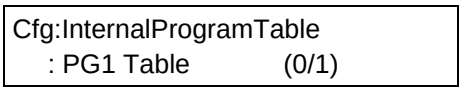


Fig. 4.1.26 Selecting the internal program table

Table 4.1.23 Selection method

Key	LCD display	Description
1	PG1 Table	The normal internal program table is selected.
2	PG2 Table	The program table complying with the EIA/CEA-861-B standard is selected.

(26) Press the [SAVE] key.

The [SAVE] key LED blinks, and a prompt asking whether data is to be saved appears on the display.

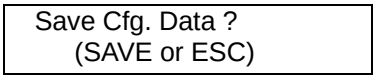


Fig. 4.1.27 Data saving

Point

Data can be saved using the [SAVE] key at any time while the config data is being edited.

(27) Press the [SAVE] key.

The config data is saved, and the [SAVE] key LED blinks.

Point

If the [ESC] key is pressed instead, operation returns to the previous display without the data having been saved.

Caution

Please do not turn off the power before the LED of the “SAVE” key lights off. Otherwise, it may lead to a trouble.

5 Signal output and data registration methods

5.1. Concerning the VG-848's functions

The VG-848 has 10 functions for outputting the video signals and registering the output data.

A list of these functions is provided below.

Table 5.1.1 List of functions

FUNC No.	Function	General description	Main application	Ref. page no.
0	Direct display	This outputs the signals of the program data when the number of the program is input. (*1)	Adjustments and inspections on production lines	p.34
1	Auto display	This automatically executes the program data in accordance with the delay time and program number.	Demonstrations, service life tests	p.42
2	Program edit	This temporarily changes the program data, and outputs signals.	Tests and evaluations undertaken by development and engineering departments	p.45
3	PC card edit	This edits the program data, and registers it on the PC card.	Creation of PC cards	p.45
4	PC card copy	This copies the data registered on the PC card.	Creation of PC cards	p.48
5	Config edit	This performs the VG-848 generator settings.	-	p.19
6	Group data edit	This registers the group data on the PC card.	Registration of data in group display mode	p.58
8	Character edit	This edits the user character data and registers it.	Tests and evaluations undertaken by development and engineering departments	p.60
9	List display	This lists the registered data on the display.	Tests and evaluations undertaken by development and engineering departments	p.62
A	YPbPr coefficient table edit	This edits the coefficient tables for the YPbPr data output.	-	p.67
B	Panel ROM copy processing	This copies the program data of an existing VG model (*2), for which PC cards cannot be used, onto a PC card.	-	p.69
C	HDCP setting	This sets the HDCP mode. (*3)		p.72
D	Calibration	This calibrates the signal output levels.	-	p.78
E	IA-575	This sets the IA-575.		p.80

*1: When group data numbers have been set by the config edit function, the signals are output in the group display mode.
*2: VG-813, 823, 826A and 827
*3: This is supported by VG-848H only. VG-848 does not support it.

5.2. Output of video signals (direct display)

By inputting the number of a program in the VG-848 or on the PC card, the video signals of the data in that program can be output. The video signals are usually output in the direct display mode.

If group data has been registered using the group data edit function (refer to "Editing group data (group data edit)" in 5.6) or if the group numbers have been set using the config edit function (refer to Chapter 4 entitled "VG-848 generator settings"), the signals are output in the group delay mode.

5.2.1. Direct output (direct display mode)

(1) Press the [FUNC] key, [0] key and [SET] key.

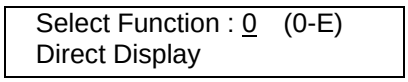


Fig. 5.2.1 Selecting the function

The direct display mode appears on the LCD display.

Point

If group data has been registered using the group data edit function (refer to "Editing group data (group data edit)" in 5.6), and if the group numbers have been set using the config edit function (refer to Chapter 4 entitled "VG-848 generator settings"), the group display mode is displayed.

(2) Use the number keys to input the program number (3 digits) (Example: "001")

- Program numbers 001 to 849 are used for PC cards; program numbers 850 to 999 are used for the internal data. (Refer to "Internal data" in 10.1.)
- Refer to "Internal data" in 10.1 for the program numbers.
- Program numbers can also be selected using the [INC] key and [DEC] key.

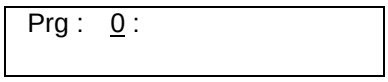


Fig. 5.2.2 Inputting the program number

Point

Normally, this screen appears when the VG-848 starts up. (Refer to "Operating modes" in 2.6.)

(3) When the program number has selected using the [INC] key or the [DEC] key on the front panel, press the [SET] key.

The video signals of the program whose number was selected are now output.

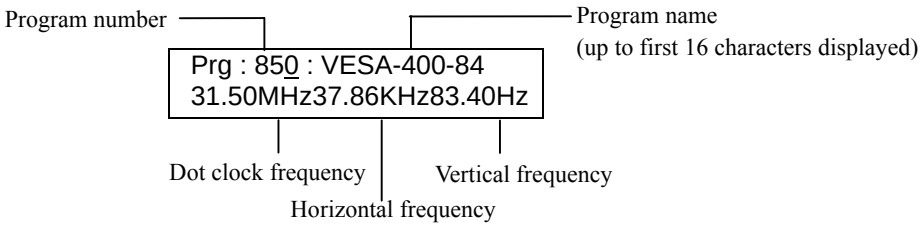


Fig. 5.2.3 Outputting the video signals

When program data is to be switched while signals are being output, perform the operations described on the next pages if necessary.

Point

By pressing the applicable key among the keys described below, the video signals can be output with some of the program data switched. (For details on how the program data is structured, keep pressing the key concerned for about 2 seconds after the power is turned on. Refer to "Concerning the internal data" in 2.7.)

- To switch the program data: [PROG] key
- To switch the timing data: [TIMING] key
- To switch the pattern data: [PAT] key

■ Switching the pattern data to be output

Press the applicable key among the keys listed below. The LED of the selected key lights, and the pattern data is switched.

Table 5.2.1 Pattern data to be output

Pattern data which is output	Name of key
Character pattern	[CHARA] key
Crosshatch patterns	[CROSS] key
Dot patterns	[DOTS] key
Circle patterns	[CIRCLE] key
Center marker patterns	[+] key
Edge marker patterns	[□] key
Diagonal line patterns	X key
Cursor patterns	[CURSOR] key
Color bar patterns	[COLOR] key
Gray scale patterns	[GRAY] key
Burst patterns	[BURST] key
Window patterns *2	[WINDOW] key
Optional patterns 1	[OP1] key
Optional patterns 2	[OP2] key
Program names	[NAME] key

*1: Refer to "■ Moving the cursor patterns."
*2: Refer to "■ Changing the window level."

Caution

Only those patterns which have been registered in the selected program data can be output.

■ Moving the cursor patterns

When the cursor pattern is displayed on the screen (refer to "Setting the cursor pattern" in 7.13), it can be moved.

(1) Press the [CURSOR] keys.

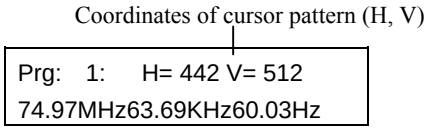


Fig. 5-2-4 Position of cursor pattern

(2) Move the cursor pattern.

When the cursor pattern has been moved, the numerical values of the coordinates on the LCD screen change. Shown below is the correspondence between the number keys which are used to move or change the cursor pattern and the operations which they are used to perform.

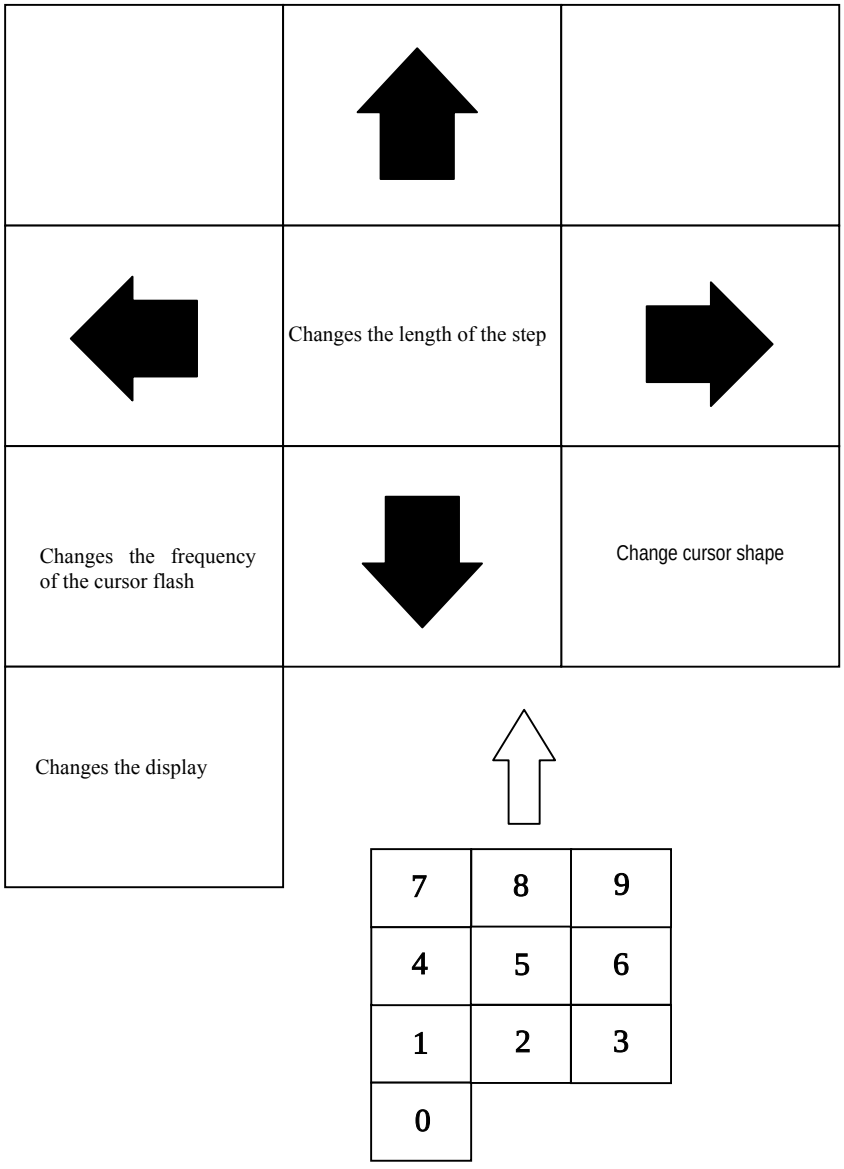


Fig. 5-2-5 Correspondence between the positions of the number keys and the operations which they are used to perform

Table 5-2-2 Description of cursor pattern operations

Key	Operation
0	This changes the method used to display the coordinates and step on the screen. (No display → Type 1 → Type 2)
1	This changes the frequency with which the cursor flashes. (No flashing → One time per 1V → ... One time per 64V)
2	This moves the cursor downward.
3	This changes the cursor shape and switches between the normal mode and sub-pixel mode. Normal mode (5x5 → Cross → V-Line) → Sub-pixel mode (5x5 → Cross → V-Line) → Normal mode
4	This moves the cursor to the left.
5	This changes the movement step. (100dot→10dot→1dot)
6	This moves the cursor to the right.
8	This moves the cursor upward.

Caution

While the cursor pattern is being moved, no operations such as inputting a program number can be performed using the number keys.

Point

Normal mode: The cursor moves on a pixel by pixel basis.
(The cursor is displayed in white.)
Sub-pixel mode: The cursor is moved in RGB units of the configuration units of the pixels.(The cursor color is displayed in the sequence of the set color -> R -> G -> B.)

(3) Switching the screen display method : 0 key

Using the 0 key, the screen display method is switched to dot units (default setting), signal electrode units (referred to as drain units below)/scanning electrode units (referred to as gate units below) or no display.

Table 5-2-3 Cursor pattern movements

Operation	Display
	(0, 0 : STEP1) ... dot units
Press the [0] key.	(GATE : 1 STEP1) (R : 1 G : 2 B : 3)... Drain/gate units
Press the [0] key.	No display
Press the [0] key.	The display method is returned to dot units. This sequence is subsequently repeated.

(4) Switching the frequency with which the cursor flashes: 1 key

Using the [1] key, the cursor is made to flash with the specified frequency. No flashing is the default setting.

Each time the 1 key is pressed.

No flashing → Flashing → Flashing → No flashing
approx. 4 times/ approx. 8 times/ subsequently repeated
1sec 1sec

(5) Selecting the cursor shape: 3 key

Using the [3] key, the shape of the cursor is changed. The default setting is a cross-shaped cursor.

Each time the 3 key is pressed.

* When the default setting is the cross-shaped cursor

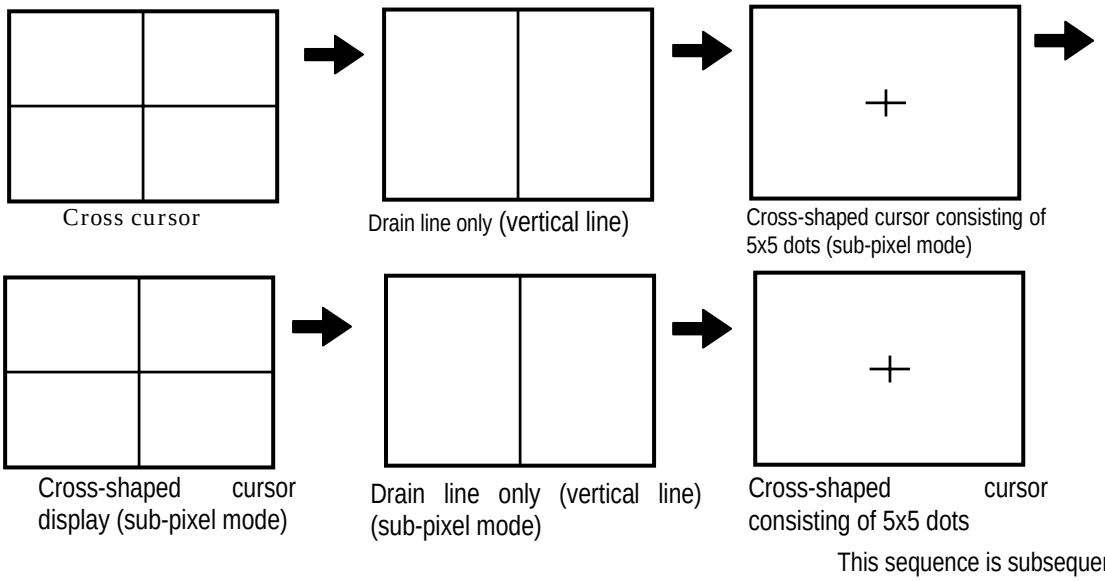


Fig. 5-2-6 Position of cursor pattern

Caution

When the cursor is moved in the sub-pixel mode, its color changes in the following sequence: set color → R → G → B. The cursor moves only when the display color has been changed to the set color. With the RGB display, it should be borne in mind that the cursor does not move and only its color is changed.

(6) Selecting the movement step of the cursor: 5 key

Using the [5] key, the length of the step by which the cursor moves when the cursor movement keys are operated is changed. The default setting is 1 dot.

Each time the 5 key is pressed.

1dot → 10 dots → 100 dots → 1 dot

This sequence is subsequently repeated.

(7) Moving the cursor

The cursor is moved using the [2], [4], [6] and [8] keys.

Each time the [2] key is pressed, the cursor moves downward (▼).

Each time the [4] key is pressed, the cursor moves toward the left (◀).

Each time the [6] key is pressed, the cursor moves toward the right (▶).

Each time the [8] key is pressed, the cursor moves upward (▲).

■ Changing the window level

The window level can be varied if either of the following settings applies to the window pattern (refer to "Setting the window pattern" in 7.11).....

- When format F has been selected
- When a format from 0 to 7 has been selected, and the flicker interval has been set to 0

The speed at which the level can be changed is fixed (1V: level).

(1) Press the [WINDOW] key.

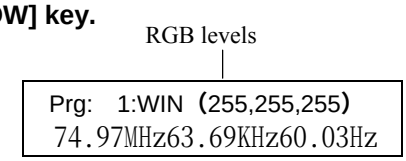


Fig. 5.2.7 RGB levels

(2) Change the window level.

Table 5.2.4 Window level changes

Key	Operation
A ([SHIFT] → [4] key)	The level is automatically increased at the speed which has been set by the flicker level.
B ([SHIFT] → [5] key)	The level is automatically reduced at the speed which has been set by the flicker level.
C ([SHIFT] → [6] key)	The level stops changing.
E ([SHIFT] → [8] key)	The level is incremented by 1 setting.
F ([SHIFT] → [9] key)	The level is decremented by 1 setting.

Caution

While the window level is being changed, no operations involving the use of the number keys such as the input of program numbers can be performed.

■ Switching the signals to be output

Press the applicable key among the keys listed below. The LED of the selected key lights, and the signals are switched.

Table 5.2.5 Signals to be output

Signal which is output	Name of key
R/G/B or R-Y/Y/B-Y signals	[R] key, [G] key, [B] key
Output inversion of R/G/B or R-Y/Y/B-Y signals	[INV] key
HS/CS and VS signals	[HS/CS] key, [VS] key (polarity is inverted by pressing the [SHIFT] key)
Green-on-sync signal	[G/S] signal
YPbPr signals	[YPbPr] key (RGB signals when LED is off)

■ Selecting whether to mute the audio signals to be output

Select the setting by pressing the [MUTE] key.

- When the LED of the [MUTE] key is lighted: The audio output is set to OFF (muted).
- When the LED of the [MUTE] key is off: The audio output is set to ON.

■ Changing the output video level

(1) Press the [LEVEL] key.

The LED of the [LEVEL] key lights, and the output video level is displayed on the LCD.

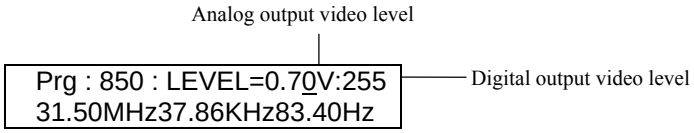


Fig. 5.2.8 Output video level

(2) Set the output video level while referring to the information below.

Table 5.2.6 Setting the output video level

Output video level	Setting range	Setting method
Analog output video level (*1)	0.30V to 1.20V	Use the number keys to input the 3-digit number. The number can also be incremented or decremented using the [INC] key or [DEC] key. The setting is reflected immediately in the output.
Digital output video level (*2)	0 to 255	

*1: The setting is reflected in analog outputs only.
*2: The setting is reflected in both analog/digital outputs.

Caution

If, in the course of setting the analog output level, the output level is set to its minimum value of 0.30V using the [DEC] key and the [DEC] key is then subsequently pressed again, the digital output is decremented in sequence from 255 to 0, and the analog output value calculated in accordance with the setting is displayed.

(3) Press the [LEVEL] key.

Operation returns to the direct display mode.

■ Changing the data of the pattern which is being output

(1) Press the [FORMAT] key.

The LED of the [FORMAT] key lights.

(2) Press the pattern key corresponding to the pattern which is to be changed.

The pattern data editing screen appears on the LCD.

Point

If the (☐) key is pressed, the pattern action editing screen appears; if the [X] key is pressed, the graphic color editing screen appears.

(3) Edit the pattern data, and output it. (Refer to "Pattern data types and setting procedures" in chapter 7.)

Point

Only the currently output pattern data is edited using the [FORMAT] key. The contents of the other program data remain unaffected. The results of the editing performed using the [FORMAT] key remain in effect until a new program is executed using the direct display function, auto display function or other function or until the program data is edited using the PC card edit function or PC card copy function.

(4) Press the [FORMAT] key.

Operation returns to the direct display mode.

■ Scrolling the pattern which is being output

(1) Press the [FORMAT] key and [+] key.

The LCD display changes.

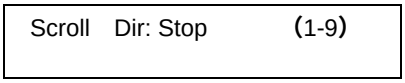


Fig. 5.2.9 Scrolling the pattern

(2) Press the number keys to scroll the pattern.

Table 5.2.7 Selecting the direction in which to scroll the pattern

Key	LCD display	Scroll direction
1	L-D	For scrolling the pattern toward the bottom left.
2	D	For scrolling the pattern downward.
3	R-D	For scrolling the pattern toward the bottom right.
4	L	For scrolling the pattern toward the left.
5	Stop	For stopping the scrolling and returning to the original position.
6	R	For scrolling the pattern toward the right.
7	L-U	For scrolling the pattern toward the top left.
8	U	For scrolling the pattern upward.
9	R-U	For scrolling the pattern toward the top right.

Point

The pattern action settings are reflected for the amount of scroll movement horizontally and vertically and interval (time in frame increments or in field increments for interlaced scanning). (Refer to "Setting the pattern action data" in 7.15.)

(3) Press the [FORMAT] key.

Operation returns to the direct display mode.

5.2.2. Outputting the group data (group display mode)

(1) Press the [FUNC] key, [5] key and [SET] key.

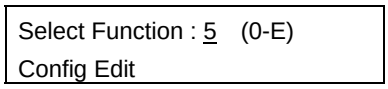


Fig. 5-2-10 Selecting the function

(2) Use the number keys to input the group number (2 digits). (Example: "01")

- For details on the group numbers, refer to "5.6. Editing group data (group data edit)."
- The group number can be changed one by one using the increment key or decrement key.

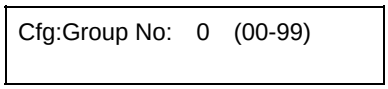


Fig. 5-2-11 Selecting the group number

Point

When "0" is specified, the group number is output in the direct display mode (refer to "5.2.1. Direct output (direct display mode)"). When any other number is specified, the group data corresponding to that group number is output in the group display mode. (Refer to "5.2.2. Outputting the group data (group display mode).")

(3) Press the [FUNC] key, [0] key and [SET] key.

The data in the selected group number is output.

Fig. 5-2-12 Inputting the group number

Point

When the increment key or decrement key is pressed at this stage, the program data set of that group data can be executed one at a time.

(4) Press the [SET] key.

The video signals in the selected group number are output.

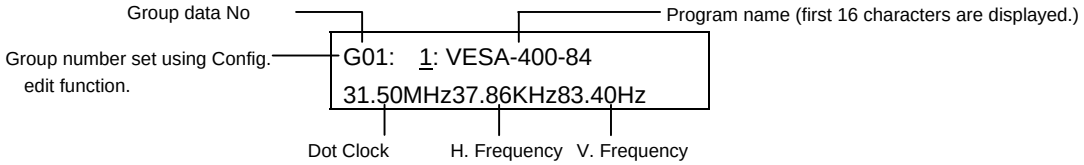


Fig. 5-2-13 Outputting the video signals

When changing over the program data settings during output, perform the operations on the next pages as and when necessary.

■ Changing the number of the group whose data is to be output

(1) Press the [ESC] key.
The screen to change the group number now appears.

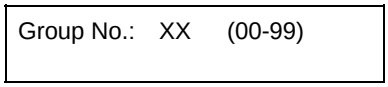


Fig. 5-2-14 Changing the group number

Point

This screen does not appear in the direct display mode even when the [ESC] key is pressed.

(2) Use the number keys to input the group number.
The group number can be changed one by one using the increment key or decrement key.

(3) Press the [FUNC] key, [0] key and [SET] key.
The data in the selected group number is output.

Fig. 5-2-15 Inputting the group number

(4) Press the [SET] key.
The video signals in the selected group number are output.

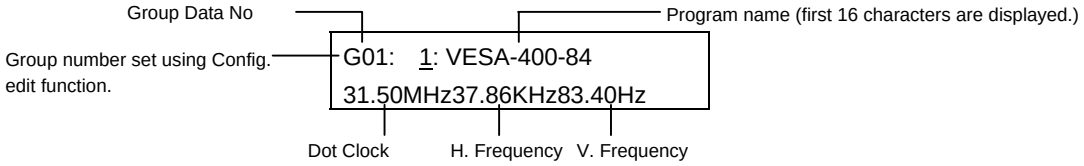


Fig. 5-2-16 Outputting the video signals

Caution

The group number settings established here cannot be saved since they are temporary. To save them, set a group number as described in "4. VG-848 generator settings," and save them in the group.

■ Switching over other settings

The steps taken for operation are the same as for the direct display function. (Refer to "5.2. Output of video signals (direct display).")

5.3. Automatic output of video signals (auto display)

(1) Press the [FUNC] key, [1] key and [SET] key.

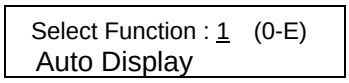


Fig. 5.3.1 Selecting the function

The auto display mode appears on the LCD.

(2) Use the number keys to input the group number.

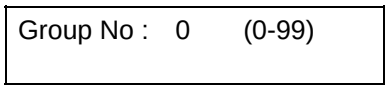


Fig. 5-3-2 Selecting group number

• If setting between 1 to 99, the program that is registered in a group are displayed by delay time. When designating the program range, set as "0".

(3) Use the number keys to input the delay time (when designating the group)

The setting range is from 0 to 999 seconds. The setting is about delay only.

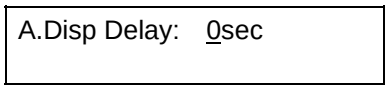


Fig. 5-3-3 Input the delay time

(4) Use the number keys to input the delay time, and press the [▶] key. (When designating the program area)

The setting range is from 0 to 999 seconds.

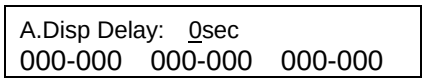


Fig. 5.3.4 Inputting the delay time

(5) Use the number keys to input the program number (in 3 digits). (Example: "001")
*** When Group No. 0 is designated.**

- Up to six program numbers can be registered in succession.
- When "000" is input, the corresponding part is skipped during output.
- When the [SAVE] key is pressed, what has been set is saved. While the settings are being saved, the LED of the [SAVE] key lights, and when the saving process has been completed, the LED goes off.

(6) Press the [SET] key.

The data of the registered program number is output at the delay time which has been set.

Point

To abort the output, press the [ESC] key. The output is aborted, and operation returns to the LCD screen in (3).

Point

If the power is turned on while the [SET] key is held down, auto display mode operations can be executed.

5.4. Editing the program data (program edit, PC card edit)

Program data is edited using the program edit function or PC card edit function.
Normally, the program edit function is used to make temporary changes to program data and output the resulting signals (the changed data is not saved). In contrast, the PC card edit function is used to edit the program data and save the edited data on the PC card.

The editing procedure is described below using the PC card edit function as an example.

(1) Press the [FUNC] key, [3] key and [SET] key.

```
Select Function : 3   (0-E)
Card Edit
```

Fig. 5.4.1 Selecting the function

(2) Use the number keys to input the program number (3 digits). (Example: "001")

- For the program numbers, refer to "Internal data" in 10.1.
- The program numbers can also be switched using the [INC] key and [DEC] key.

```
Prog No:   1 Enable   (0/1)
ASTRO AK
```

Fig. 5.4.2 Inputting the program number

The program name and "Enable" now appear on the screen.

(3) When timing data is to be edited, press the [TIMING] key, and proceed with the editing. (Refer to "Timing data configuration and setting procedures" in Chapter 6.)

```
Timing Edit:      0    (0-3)
H-Timing Data Edit
```

Fig. 5.4.3 Editing the timing data

Caution

- The dot clock, horizontal frequency and vertical frequency of the VG-848 internal program of NTSC(Prog No. 968), PAL (Prog No. 969) and SECAM (Prog No. 964) should not be edited. Otherwise, VBS and Y/C output cannot be available.

Point

When the [TIMING] key is pressed again, operation returns to the program name and "Enable" display screen.

(4) When pattern data is to be edited, press the [PAT] key, and proceed with the editing. (Refer to "Pattern data types and setting procedures" in Chapter 7.)

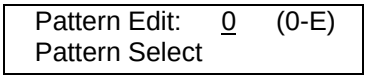


Fig. 5.4.4 Editing the pattern data

Point

When the [PAT] key is pressed again, operation returns to the program name and "Enable" display screen.

By following these steps, the program data has now been edited. To check or save the edited data or to edit other data, proceed with the operations on the following pages.

■ To check the edited data

When the [SET] key is pressed on the timing data editing or pattern data editing screen, the data is output to a CRT, LCD or other display device.

■ To save the edited data

Caution

The PC card edit function is the only function that can be used to save the data.

(1) With the program name and "Enable" displayed on the screen, press the [▶] key to move the cursor to "Enable," and press the [1] key to established the "Enable" mode.

Point

If the [0] key is pressed instead, the "Disable" mode is established. Use this setting to prohibit the use of specific program data on the PC card. Normally, the "Enable" mode is selected. Programs for which "Disable" has been set will no longer be subject to the program selection in response to the [INC] key and [DEC] key or to auto display execution.

(2) Press the [▶] key to move the cursor to "Program name," and input the program name (using up to 20 characters).

(3) Press the [SAVE] key.
The LED of the [SAVE] key blinks, and the LCD screen is switched.

Fig. 5.4.5 Saving the data

(4) Input the program number and program name, and press the [SAVE] key.
The program data is now saved on the PC card, and the LED of the [SAVE] key goes off.

Point

The keys on the RB-1848 are used to input the program name. (Refer to "How to input character codes from the display" in 5.10.)

■ To edit other data

After the data has been edited and saved, press the [PROG] key to input the program number, and follow the same operating procedure.

5.5. Copying program data (PC card copy)

(1) Press the [FUNC] key, [4] key and [SET] key.

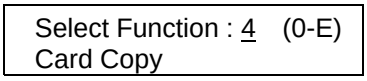


Fig. 5.5.1 Selecting the function

(2) While referring to Table 5.5.1, use the number keys to select the type of copy function, and set the details.

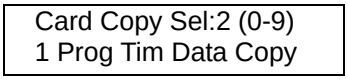


Fig. 5.5.2 Selecting the type of copy function

Table 5.5.1 Copy function types

Key	LCD display	Copy type	Ref. page no.
0	1 Prog Data Copy	For copying program data in 1-program increments.	p.49
1	1 Prog Tim Data Copy	For copying timing data in 1-program increments.	
2	1Prog Pat Data Copy	For copying pattern data in 1-program increments.	
3	BLK Prog Data Copy	For copying program data in increments of multiple blocks.	p.50
4	CHR Data Copy	For copying user character data in 1-character increments.	p.51
5	IMG Data Copy	For copying image data in 1-data increments.	p.52
6	OPT Data Copy	For copying user-created optional pattern data in 1-data increments.	p.52
7	Group Data Copy	For copying group data in 1-group increments.	p.53
8	Auto Data Copy	For copying the auto display data.	p.54
9	Card/ROM Erase	For erasing all the data on the PC card.	p.54
A	All Copy	All data copy	P.55
B	1 Prog Data Erase	Erase the card data per program	p.57

■ Copying data in 1-program increments (1 Prog Data Copy)

(1) Use the number keys to input the number of the data program serving as the copy source, and press the [SET] key.

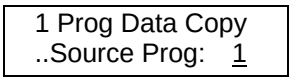


Fig. 5.5.3 Inputting the copy source data program number

Point

When program data inside the VG-848 is used, program numbers 850 to 999 can be designated as the copy source.

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Use the number keys to input the number of the data program serving as the copy destination, and press the [SET] key.

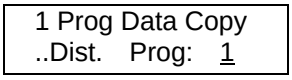


Fig. 5.5.4 Inputting the copy destination data program number

The data is now written into the copy destination.

Caution

An error occurs if any program from program No.850 to No.999 is designated as the copy destination.

(4) To copy other programs, repeat the above steps after the screen in step (1) has reappeared.

■ Copying program data in increments of multiple blocks (BLK Prog Data Copy)

(1) Use the number keys to input the range of the data program numbers serving as the copy source, and press the [SET] key.

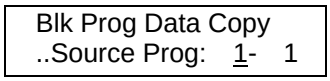


Fig. 5.5.5 Inputting the copy source data program numbers

Point

When program data inside the VG-848 is used, program numbers 850 to 999 can be designated as the copy source.

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Use the number keys to input the range of the data program numbers serving as the copy destination, and press the [SET] key.

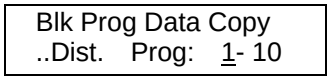


Fig. 5.5.6 Inputting the copy destination data program numbers

The data is now written into the copy destination.

Caution

An error occurs if any program from program No.850 to No.999 is designated as the copy destination.

(4) To copy other programs, repeat the above steps after the screen in step (1) has reappeared.

■ Copying user characters (CHR Data Copy)

(1) Input the user character code (E0H to EFH, F0H to FFH) serving as the copy source, and press the [SET] key.

Fig. 5.5.7 Inputting the copy source user character code

Point

When user character data inside the VG-848 is used, the F0H to FFH codes can be designated.

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Input the user character code (E0H to EFH) serving as the copy destination, and press the [SET] key.

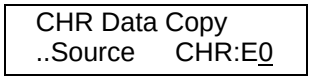


Fig. 5.5.8 Inputting the copy destination user character code

The data is now written into the copy destination.

Caution

An error occurs if any code from F0H to FFH is designated as the copy destination.

(4) To copy other user characters, repeat the above steps after the screen in step (1) has reappeared.

■ Copying image data (IMG Data Copy)

Caution

Image data can be copied only from one PC card to another.

(1) Use the number keys to input the image number (1 to 64) serving as the copy source, and press the [SET] key.

```
IMG Data Copy
..Source     IMG: 1
```

Fig. 5.5.9 Inputting the copy source image number

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Use the number keys to input the image number (1 to 64) serving as the copy destination, and press the [SET] key.

```
IMG Data Copy
..Dist     IMG: 2
```

Fig. 5.5.10 Inputting the copy destination image number

The data is now written into the copy destination.

(4) To copy other image data, repeat the above steps after the screen in step (1) has reappeared.

■ Copying optional patterns (OPT Data Copy)

Caution

Optional pattern data can be copied only from one PC card to another.

(1) Input the optional pattern number (40H to 7FH) serving as the copy source, and press the [SET] key.

```
OPT Data Copy
..Dist     OPT:40
```

Fig. 5.5.11 Inputting the copy source optional pattern number

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Input the optional pattern number (40H to 7FH) serving as the copy destination, and press the [SET] key.

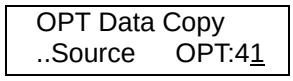


Fig. 5.5.12 Inputting the copy destination optional pattern number

Caution

An error occurs if an optional pattern (00H to 3FH) inside the VG-848 is designated as the copy destination.

The data is now written into the copy destination.

(4) To copy other optional patterns, repeat the above steps after the screen in step (1) has reappeared.

■ Copying group data (Group Data Copy)

(1) Input the group number serving as the copy source, and press the [SET] key.

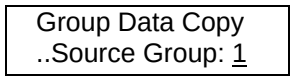


Fig. 5.5.13 Inputting the copy source group number

(2) To copy the data on one PC card onto another PC card, replace the PC card with the one which will serve as the copy destination.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Input the group number serving as the copy destination, and press the [SET] key.

Fig. 5.5.14 Inputting the copy destination group number

The data is now written into the copy destination.

(4) To copy other group data, repeat the above steps after the screen in step (1) has reappeared.

■ Copying auto display data (Auto Data Copy)

(1) Insert the PC card serving as the copy source, and press the [SET] key.

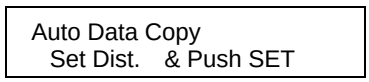


Fig. 5.5.15 Inserting the copy source PC card

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(2) Insert the PC card serving as the copy destination, and press the [SET] key.

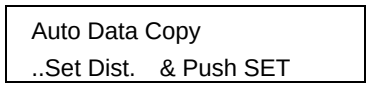


Fig. 5.5.16 Inputting the copy destination PC card

The data is now written into the copy destination.

(3) To copy other auto display data, repeat the above steps after the screen in step (1) has reappeared.

■ Erasing card data (Card Erase)

(1) Insert the PC card whose data is to be erased, and press the [SET] key.

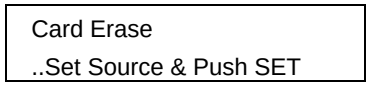


Fig. 5.5.17 Inserting the PC card

"Writing" appears on the LCD, and data erasure begins.

Point

- It takes several minutes for the data to be erased.
- New PC cards are already formatted.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(2) To erase the data on other cards, repeat the above steps after the screen in step (1) has reappeared.

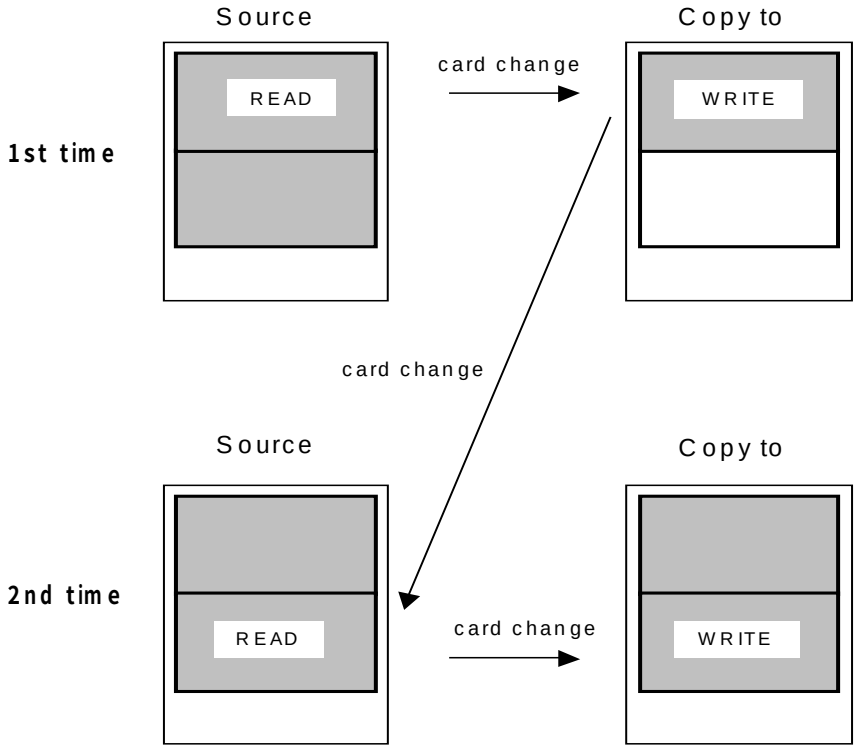
■ All data copy

For using this function

The attached 64MB PC card reads all data by two steps. It takes about 10 minutes. If you have PC that can read and write the PC card, it would be faster and safer to use it. Please take the following procedure (1) to (5) when using VG to copy all data.

⚠ Caution	• During copying, do not extract PC card, otherwise the card may break. • When exchanging PC cards, do not mistake copied source card and copy to card, otherwise, the card may break.	⊘

PC card all copy image



Point

- It takes about 10 minutes.
- The attached 64MB PC card is copied by two steps.

(1) Insert the copied source card and press [SET] key.

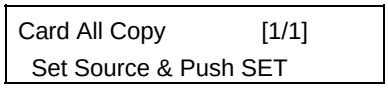


Fig. 5-5-18 Set the copied PC card

Point

- Copying takes a few minutes.
- Copying is done in 2 steps.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(2) Insert the copy to PC card and press [SET] key.

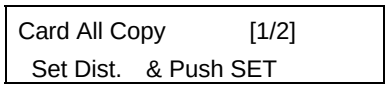


Fig. 5-5-19 Set the copy to PC card

Here the data of the first step is written in a PC card. Insert the copied card again.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(3) Insert the copied source card again, and press [SET] key.

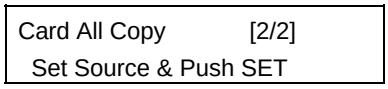


Fig. 5-5-20 Set copied source card

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(4) Insert the copy to PC card and press [SET] key.

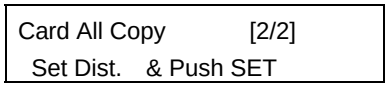


Fig. 5-5-21 Set the copy to PC card

Here, the data of the second step is written in a PC card.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(5) To continue to copy other program, repeat the above steps after the screen (1) has ppeared.

■ Erasing card data per program (1 Prog Data Erase)

(1) Insert the deleting PC card, press deleting program number and press [SET] key.

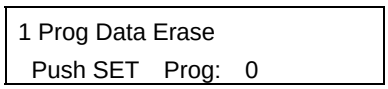


Fig. 5-5-22 Inser the PC card

"Writing" appears on LCD, and it starts to delete.

Point

- It takes a few seconds.

Caution

When changing over the card, follow the procedures in "How to eject the PC card" in 3.2.4 and "How to insert the PC card" in 3.2.3. If incorrect procedures are followed, the data on the PC card may be damaged.

(2) To delete other program, repeat the above steps after the screen (1) has reappeared.

5.6. Editing group data (group data edit)

When the data in a multiple number of programs is to be output, the programs can be executed one at a time by changing their numbers in ascending or descending order using the [INC] key or [DEC] key in the direct display mode. Alternatively, the programs (group data) which have been registered using the group data edit function can be executed in numerical order in the group display mode.

Group data consists of timing data program numbers and pattern data program numbers. If, for instance, group data No.1 as shown in the table below is executed, the pattern data in program No.900 will be executed using the timing data in program No.850.

Table 5.6.1 Example of group data

Group data No.	Timing program No.	Pattern program No.
1	850	900
2	851	901
:	:	:

(1) Press the [FUNC] key, [6] key and [SET] key.

```
Select Function:6   (0-E)
Group Edit
```

Fig. 5.6.1 Selecting the function

(2) Use the number keys to input the group number (1 to 99), and press the [SET] key.

```
Group No : 1
```

Fig. 5.6.2 Inputting the group number

(3) Set the group data.

Input the program number of the timing data (Tim) and program number of the pattern data (Pat).

```
GEdit   01:Tim=850 Pat=900
 (01)    02:Tim=851 Pat=901
```

```
GEdit   03:Tim=850 Pat=902
 (01)    04:Tim=851 Pat=903
```

Fig. 5.6.3 Setting the group data

Point

- There is no need to perform all the settings: "0" may be kept as the setting.
- When "0" is set for both the timing data and pattern data, the data will not be executed in the group display mode. (It will be skipped when the [INC] key or [DEC] key is pressed.) If "0" is set for either the timing or pattern data, the data for which "0" is not set will be executed. (When "0" is set for the timing data, only the pattern data is executed.)

(4) When program data, timing data or pattern data only is to be set, press the respective key to set the data.

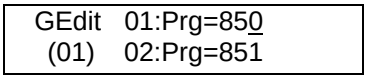


Fig. 5.6.4 Setting only the program number

Table 5.6.3 Selection method

Key	General description
[PROG] key	The LED lights, and the program data only is set.
[TIMING] key	The LED lights, and the timing data only is set.
[PAT] key	The LED lights, and the pattern data only is set.

(5) Press the [SAVE] key.

The LED of the [SAVE] key blinks.

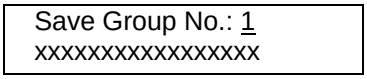


Fig. 5.6.5 Saving the data

Point

The data can be saved at any time using the [SAVE] key while group data is being edited.

(6) Use the number keys to input the number of the group (1 to 99) in which the data is to be saved.

(7) Use the number keys to input the name of the group (with up to 20 characters).

Point

(Refer to "How to input character codes from the display" in 5.10 for details on how to input the group name.)

(8) Press the [SAVE] key.

The group data is saved, and the LED of the [SAVE] key goes off.

Point

If the [ESC] key is pressed, operation returns to the previous screen without the data having been saved.

5.7. Editing character patterns (character edit)

Caution

Character patterns are edited while they are on the display. Before proceeding with the editing, connect the display device to the VG-848, and check that the patterns are displayed properly.

(1) Press the [FUNC] key, [8] key and [SET] key.

```
Select Function:8   (0-E)
Character Edit
```

Fig. 5.7.1 Selecting the function

(2) Use the number keys to input the character code (E0 to FF), and press the [SET] key.

```
CHR    Edit :E0    (E0-FF)
```

Fig. 5.7.2 Inputting the character code

The character pattern appears on the display

```
CHR    Edit :E0
       Editing on Display
```

Fig. 5.7.3 LCD display

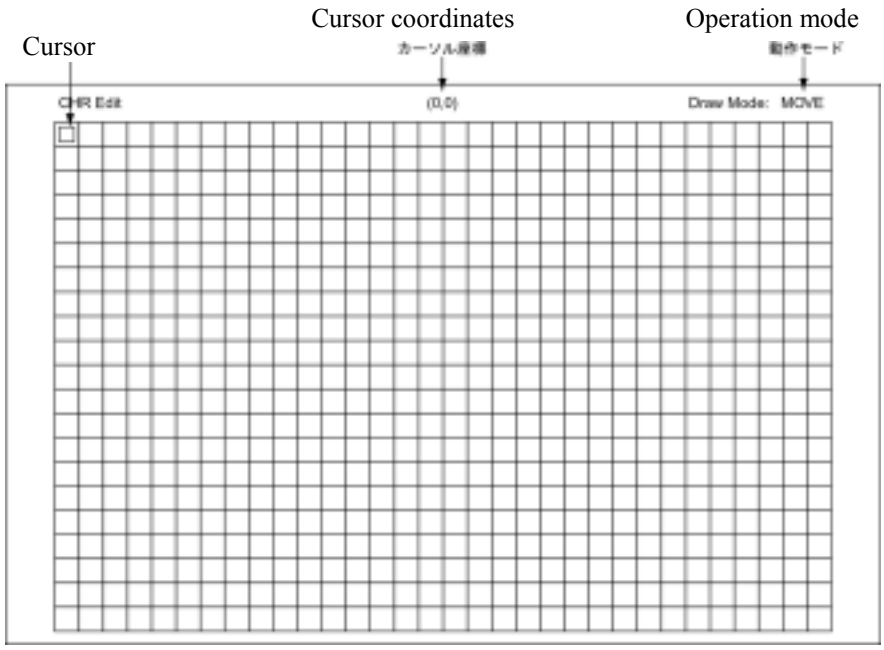


Fig. 5.7.4 Display

Caution

- A letter from A to F can be input by pressing the [SHIFT] key followed by one of the number keys.
- F0 to FF are character patterns contained inside the VG-848. They can be read out but not registered.

(3) Edit the character pattern while referring to the following.

Table 5.7.1 Editing the character patterns

Key	Description of function
Number keys ([1] to [4], [6] to [9])	• In the dot setting mode: Used to move the cursor or draw in the direction of the arrows of the number keys. • In the dot clearing mode: Used to move the cursor or draw in the direction of the arrows of the number keys. • In the movement mode: Used to move the cursor (but not to draw) in the direction of the arrows of the number keys. • In the shift mode: Used to shift the character pattern in the designated direction
Number key [5]	Used to select the drawing mode (dot setting → dot clearing → movement).
[SET] key	Used to draw or clear at the dot where the cursor is positioned.
[0/CLR] key	Used to clear all the dots inside the cell.
[SHIFT] key	Used to select the shift mode for the dot pattern. • ON: Shift mode • OFF: Drawing mode
[INV] key	Used to invert the dot inside the cell.
[HS] key	Used to return to the home position at the left or right of the cursor position (alternating movement between far left and far right).
[VS] key	Used to return to the home position above or below the cursor position (alternating movement between very top and very bottom).
[ESC] key	Used to abort the editing and return to the previous LCD screen.

(4) Press the [SAVE] key.

The LED of the [SAVE] key blinks.

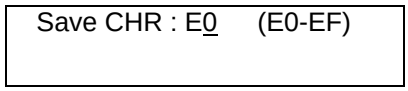


Fig. 5.7.5 Saving the data

Point

The data can be saved at any time using the [SAVE] key while the character pattern is being edited.

(5) Use the number keys to input the code (E0 to EF) of the character pattern which is to be saved.

Point

A letter from A to F can be input by pressing the [SHIFT] key followed by one of the number keys.

(6) Press the [SAVE] key.

The character pattern is saved, and the LED of the [SAVE] key goes off.

Point

If the [ESC] key is pressed instead, operation returns to the previous screen without the data having been saved.

5.8. Listing the data on the display (list display)

Point

The list display function is used to display the lists on the display screen. Before proceeding with the list display, connect the display device to the VG-848, and check that the display appears properly.

(1) Press the [FUNC] key, [9] key and [SET] key.

```
Select Function:9   (0-E)
Lists
```

Fig. 5.8.1 Selecting the function

(2) While referring to Table 5.8.1, use one of the number keys to select the list to be displayed, and press the [SET] key to set the details.

```
Select Type:0    (0-5)
Program Data List
```

Fig. 5.8.2 Selecting the list

Table 5.8.1 Selection method

Key	LCD display	List	Ref. page no.
0	Program Data List	Used to display the program data H-Timing, V-Timing and OUTPUT.	p.63
1	Program Name List	Used to display a list of the program names.	p.63
2	Group Name List	Used to display a list of the group names.	p.64
3	OPT Name List	Used to display a list of the optional pattern names.	p.64
4	IMG Name List	Used to display a list of the image data names.	p.65
5	Groupd Data List	Used to display the program data that is registered in a group.	p.66

■ When Program Data has been selected

Use the number keys to input the program number (3 digits) to display the data of the program on the display.

```
Select Prg.No   (850)
Program Data List
```

Fig. 5.8.3 LCD display

```
PROG-NO.850      NAME=VESA400-84
MODE      : dot                          H=37.86KHz   V=83.40Hz   ENABLE
CLOCK     : 31.500MHz                    MODE        : H
HPERIOD : 26.41us 832dot                 VTOTAL      : 11.991ms    454H
HDISP     : 20.32us 640dot               VDISP       : 10.565ms    400H
HSYNC     : 1.27us 40dot                 VSYNC       : 0.790ms      3.0H
HBACKP    : 4.06us 128dot                VBACKP      : 1.004ms      38H
HDSTART : 0.00us 0dot                    EQP FP      : 0.000ms      0.0H
HDWIDTH : 0.00us 0dot                    EQP BP      : 0.000ms      0.0H
                                         SERRATION : OFF
ANA/TTL    : ANALOG                      EQP         : OFF
HS         : NEGA                        VDSTART     : 0.000ms      0.0H
VS         : POSI                        VDLINE      : 0.000ms      0.0H
CS         : NEGA                        SCAN        : NON INTER
VIDEO      : 0.70V
SYNC       : 0.30V
SETUP      : 0.00V                       Freq L      : 100
RGB/TpbPr : RGB                          Freq R      : 100
YpbPrNo.   : 0                           Level L     : 0
                                         Level R     : 0
D-Connecter : 480                        SWEEP       : OFF
              : Interlace
              : 4:3
Ana BNC    : ON
Ana Dsub   : ON
Ana DVI    : OFF
D-Con      : OFF
S-Connecter : NORMAL
DVI Mode   : SINGLE
```

Fig. 5.8.4 Data appearing on the display

Point

If the [ESC] key is pressed instead, operation returns to the previous screen.

■ When Program Name has been selected

When the number (3 digits) of the program to be displayed first is input using the number keys, the data in that program appears on the display first, and it is followed by the data of the subsequent programs.

```
Select Prg.No   (Top=850)
Program Name List
```

Fig. 5.8.5 LCD display

```
Program Name List
Prg E/D DotClock   H-Freq      V-Freq     Name
850   E   31.50MHz   37.86KHz   83.40Hz   VESA400-84
851   E   31.50MHz   37.86KHz   72.82Hz   VESA400-72
                        :
                        :
```

Fig. 5.8.6 Data appearing on the display

Point

If the [ESC] key is pressed instead, operation returns to the previous screen.

■ When Group Name has been selected

Caution

The group data cannot be displayed unless a PC card has been inserted.

When the number (2 digits) of the group to be displayed first is input using the number keys, the data in that group appears on the display in numerical order.

```
Select Grp.No   (Top= 1)
Group Name List
```

Fig. 5.8.7 LCD display

```
Group Name List
NO   Name
 1   Group Data #1
 2   Group Data #2
                :
                :
```

Fig. 5.8.8 Data appearing on the display

Point

If the [ESC] key is pressed instead, operation returns to the previous screen.

■ When OPT Name has been selected

Caution

The optional pattern data cannot be displayed unless a PC card has been inserted.

When the number (2 digits) of the optional pattern to be displayed first is input using the number keys, the data of that optional pattern appears on the display first, and it is followed by the data of the subsequent programs.

```
Select Opt.No   (Top=40)
OPT Name List
```

Fig. 5.8.9 LCD display

```
OPT Pattern List   Block(Used=xx, Unused=xx)
NO   SIZE      Name
40    506     256 Block Color
41    255     64B-GRAY
                :
                :
```

Fig. 5.8.10 Data appearing on the display

Point

- A letter from A to F can be input by pressing the [SHIFT] key followed by one of the number keys.
- "SIZE" shows the number of bytes of the optional pattern data.
- "Used" and "Unused" denote the number of blocks (in 1KB increments) already used and the number of unused blocks on the PC card.
- If the [ESC] key is pressed instead, operation returns to the previous screen.

■ When IMG Name has been selected

Caution

The image data cannot be displayed unless a PC card has been inserted.

When the number (2 digits) of the optional pattern to be displayed first is input using the number keys, the data of that optional pattern appears on the display first, and it is followed by the data of the subsequent programs.

```
Select IMG.No   (Top= 1)
Group Name List
```

Fig. 5.8.11 LCD display

```
IMG data List   Block(Used=xx, Unused=xx)
NO    OPT-NO      SIZE          Col        NAME
 1      80      ( 1024,  768)   1024x768   Image #1
 2      81      (  640,  480)   640x480    Image #1
                    :
                    :
```

Fig. 5.8.12 Data appearing on the display

Point

- A letter from A to F can be input by pressing the [SHIFT] key followed by one of the number keys.
- "SIZE" shows the numbers of the horizontal dots and vertical lines of the image data.
- "Used" and "Unused" denote the number of blocks (in 1KB increments) already used and the number of unused blocks on the PC card.
- "OPT-NO" is the number of the optional pattern which displays the image data.
- If the [ESC] key is pressed instead, operation returns to the previous screen.

■ When Group Data has been selected

When the number (2 digits) of the group is input, the data appears on the display.

```
Select Prg.No     (1)
Group Data List
```

Fig. 5-8-13 LCD display

```
GRP-NO.01 PROG-No001   NAME=VESA400-84
MODE      : dot                          H=37.86KHz  V=83.40Hz   ENABLE
CLOCK     : 31.500MHz                    MODE        : H
HPERIOD : 26.41us 832dot                 VTOTAL      : 11.991ms    454H
HDISP     : 20.32us 640dot               VDISP       : 10.565ms    400H
HSYNC     : 1.27us 40dot                 VSYNC       : 0.790ms      3.0H
HBACKP    : 4.06us 128dot                VBACKP      : 1.004ms      38H
HDSTART : 0.00us 0dot                    EQP FP      : 0.000ms      0.0H
HDWIDTH : 0.00us 0dot                    EQP BP      : 0.000ms      0.0H
                                         SERRATION : OFF
ANA/TTL    : ANALOG                      EQP         : OFF
HS         : NEGA                        VDSTART     : 0.000ms      0.0H
VS         : POSI                        VDLINE      : 0.000ms      0.0H
CS         : NEGA                        SCAN        : NON INTER
VIDEO      : 0.70V
SYNC       : 0.30V
SETUP      : 0.00V                       Freq L      : 100
RGB/TpbPr : RGB                          Freq R      : 100
YpbPrNo.   : 0                           Level L     : 0
                                         Level R     : 0
D-Connecter : 480                        SWEEP       : OFF
              : Interlace
              : 4:3
Ana BNC    : ON
Ana Dsub   : ON
Ana DVI    : OFF
D-Con      : OFF
S-Connecter : NORMAL
DVI Mode   : SINGLE
```

Fig. 5-8-14 Data appearing on the display

Point

If the [ESC] key is pressed instead, operation returns to the previous screen.

The screen for inputting the group number is displayed when the increment key or decrement key is pressed. The program data of that group data can now be shown on the display.

```
GroupDataListNo
                  :   1 (1-99)
```

Fig. 5-8-15 LCD display

5.9. Setting the color difference coefficients (YPbPr coefficient table editing)

Point

For details on the color difference coefficients, refer to "YPbPr coefficient tables" in 10.1.4.

(1) Press the [FUNC] key, [A] key and [SET] key.

```
Select Function: A   (0-E)
YPbPr   Edit
```

Fig. 5.9.1 Selecting the function

(2) Use the number keys to input the number of the table (0 to 9), and press the [SET] key.

- The table numbers can also be changed one at a time using the [INC] key or [DEC] key.

```
YPbPr    No.:        0   (0-9)
SMPTE    274M,296M,RP-177
```

Name corresponding

ffi i

Fig. 5.9.2 Inputting the table number

(3) Use the number keys to input the R, G and B coefficients (0 to 1.0000).

```
Y:0.2126   0.7152   0.0722
           R        G        B

Pb:0.1146  0.3854   0.5000
Pr:0.5000  0.4542   0.0458
           R        G        B
```

Fig. 5.9.3 Coefficient input

When the [>] key is pressed, the cursor moves, and when the [DEC] key is pressed, the next page is displayed.

(4) Press the [SAVE] key.

The LED of the [SAVE] key blinks.

```
SAVE YPbPr   No.: 3
```

Fig. 5.9.4 Saving the data

Point

The data can be saved at any time using the [SAVE] key while the coefficients are being edited.

(5) Use the number keys to input the number of the table (3 to 9) serving as the save destination for the coefficients.

Caution

Do not specify table No.0 to 2 as the save destination for the coefficients since these tables are used by the program data inside the VG-848. If, by mistake, one of these tables has been overwritten by saving coefficients, initialize the flash ROM inside the VG-848. (Refer to "Initializing the internal flash ROM" in 9.6.) This will restore the factory settings.

(6) Press the [SAVE] key.

The coefficients are save, and the LED of the [SAVE] key goes off.

Point

If the [ESC] key is pressed instead, operation returns to the previous screen without the data having been saved.

5.10. How to input character codes from the display

The character codes indicated on the display can be selected and input for the program names, group names and character pattern codes.

(1) Connect the display device to the VG-848, and check that the display appears properly.

(2) Use the [□] key to move the LCD cursor to the position where the character code is to be input, and press the [LEVEL] key.

The LED of the [LEVEL] key lights, and the character code appears on the display.

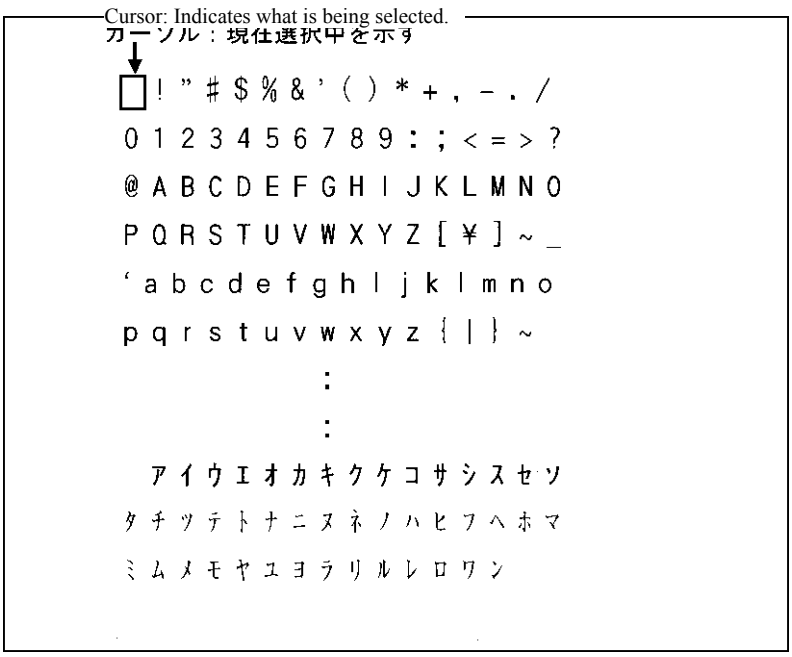


Fig. 5.10.1 What is displayed on the screen

(3) While referring the table below, input the character codes.

Table 5.10.1 Character code input

Key	Description of function
Number keys ([1] to [4], [6] to [9])	Used to move the cursor over the display in the direction of the arrows of the number keys.
Number key [5]	Used to enter the input character. The entered character appears on the display.
[CLR] key	Used to move the cursor on the display to the top left.

(4) Press the [LEVEL] key.

The LED of the [LEVEL] key goes off, and operation returns to the status in which hexadecimal characters (0 to 9, A to F) can be input.

5.11. Copying panel ROM data of previous VG models

The ROM data (program data, group data and character data) of old VG models (823, 813, 826A, 827) can be converted. Use the RS-232C connector (reverse) to connect the VG-848 and the old VG model, and proceed.

(1) Press the [FUNC] key, [B] key and [SET] key.

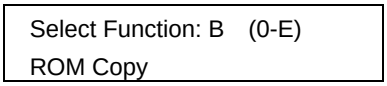


Fig. 5.11.1 Selecting the function

(2) Select the VG model serving as the data copy source.

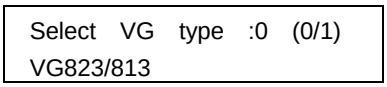


Fig. 5.11.2 Selecting the old VG model as the data copy source (VG-823 or 813)

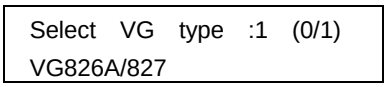


Fig. 5.11.3 Selecting the old VG model as the data copy source (VG-826A or 827)

Table 5.11.1 Selection of old VG models as the data copy source

Key	VG generator model
0	823/813
1	826A/827

(3) Press the [▼] key to transfer to the next page, and select the data which is to be copied.

Function :0 (0-2) Blosk Prog. Data Copy

Fig. 5.11.4 Selecting the data to be copied (program data)

Function :1 (0-2) Group Data Copy

Fig. 5.11.5 Selecting the data to be copied (group data)

Function :2 (0-2) Character Data Copy

Fig. 5.11.6 Selecting the data to be copied (character data)

Table 5.11.2 Selection of data to be copied

Key	Type of data copied
0	Program data
1	Group data
2	Character data

(4) Press the [▼] key to transfer to the next page, and select the ROM model serving as the copy source.

Panel Rom type :0 (0-2) 58C65P

Fig. 5.11.7 Selecting the ROM model (58C65P)as the copy source

Panel Rom type :1 (0-2) 58C256P

Fig. 5.11.8 Selecting the ROM model (58C256P)as the copy source

Panel Rom type :2 (0-2) AH-3000

Fig. 5.11.9 Selecting the ROM model (AH-3000)as the copy source

Table 5.11.3 Selection of ROM models as copy source

Key	ROM
0	58C65P
1	58C256P
2	AH-3000

(5) Press the [▼] key to transfer to the next page, and enter the program numbers of the copy source and copy destination using the number keys for this purpose.

Src Prg No.	:001-010
Dst Prg No.	:005-015

Fig. 5.11.10 Entering the copy source and destination program numbers (for program data)

Src Grp No.	:01
Dst Grp No.	:02

Fig. 5.11.11 Entering the copy source and destination program numbers (for group data)

Src CHR No.	:01
Dst CHR No.	:02

Fig. 5.11.12 Entering the copy source and destination program numbers (for character data)

Table 5.11.3 Restrictions on data copied and copy source ROMs

	58C65P	58C256P	AH-3000
Program data	001-040	001-740	001-779
Group data	01-02	01-40	01-40
Character data	E0-EE	E0-EE	E0-EE

(6) Press the [SET] key to save the data.

Point

The data can be saved at any time using the [SET] key during the editing process.

Caution

When the program data copied from the old VG contains the data besides the setting range, the program data serves as Disable.

5.12. HDCP Setting

(1) Press [FUNC] key, [C] key and [SET] key.

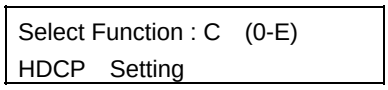


Fig. 5-12-1 Selecting the function

(2) The following display appears on the LCD display.

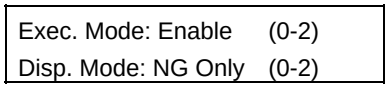


Fig. 5-12-2 Selecting the HDCP mode

(3) Select the execution mode and display mode.

Table 5-12-1 HDCP mode selection

ITEM	Setting	LCD	Description
Exec. Mode	0	Disable	HDCP is not executed when all programs are executed.
	1	Enable	HDCP is executed when all programs are executed..
	2	Program	HDCP is executed only when a program whose HDCP item in the program data has been enabled is executed.
Disp. Mode	0	NG Only	The results are displayed on the monitor only when NG results for the check.
	1	ALL	The check results are displayed on the monitor every time.
	2	Pattern	HDCP is executed while the pattern remains displayed.

(4) Use the [▼] key to move to the next page, and set the interval and type.

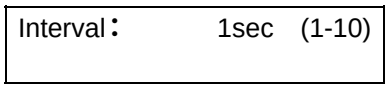


Fig. 5-12-3 Selecting the interval and type

Table 5-12-2 Enter the interval and type

Item	Setting	Descriptions
Interval	1 to 10 (default value=1)	The HDCP link check and encryption are executed at the interval which has been set. (in 1-second increment)

(5) Move to the next page with the [▼] key, and select ON or OFF for initiating reset when the HDCP certification is OK or NG.

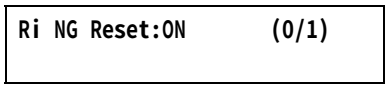


Fig. 5-12-4 Reset ON/OFF setting screen

Table 5-12-3 Reset ON/OFF settings

Key	LCD	Description
0	ON	Reset is initiated when HDCP certification is NG, and operation is retried starting from the initial certification.
1	OFF	Certification is not retried even when HDCP certification is NG.

Caution

"Ri" on the setting screen stands for "Video transmitter and receiver link synchronization verifications values," and it is displayed as "RI."

(6) When the [SAVE] key is pressed on any of the screens used during the HDCP setting data editing, its LED blinks, and the following appears on the LCD display.

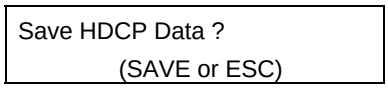


Fig. 5-12-5 Confirmation of saving data

(7) When the [SAVE] key is pressed again, the config data is saved, and the LED goes off.

If the [ESC] key is pressed instead, operation returns to the previous screen without the data having been saved.

5.13. Setting HDCP for the data of each program number

When “Exec Mode” has been set to “Program” in Fig. 5.12.1, HDCP enable or disable must be set for the data of each program number.

HDCP is executed only when executing a programfor which the program data HDCP item is set to enable. It is not executed for a program whose HDCP item is set to disable.

(1) Press the [FUNC] key, [3] key and [SET] key.

Select Function: 3 (0-E) Card Edit

Fig. 5-13-1 Selecting the function

(2) The following initial display appears.

Prog No： 1 Enable (0/1) ASTRO AK [H]

Fig. 5-13-2 Initial display

(3) When the [>] ey is pressed and the cursor is moved inside [ ] at the bottom right, the HDCP enable/disable setting can be changed using the [1] key (enable:H) or [0] key (disable:blank).

(4) When the [SAVE] key is pressed, the LED blinks, and the following appears on the LCD screen.

Prog No： 1 Enable (0/1) ASTRO AK [H]

Fig. 5-13-3 Confirmation of saving data

Enter here the number and name of the program to be stored, and press the [SAVE] key again. The program data is now stored on the memory card. (The LED goes off once the data storing is completed.)

5.14. HDCP execution

When the timing and pattern data is executed in the direct display mode, HDCP is executed at the same time.

(1) Press the [FUNC] key, [0] key and the [SET] key.

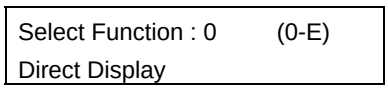


Fig. 5-14-1 Selecting the function

(2) The following initial display appears

Fig. 5-14-2 Initial display

(3) Use the number keys to input the program number (3 digits) or select the program number using the [▲]key and [▼] key.

(4) During the HDCP execution, the character at the bottom right of the LCD display switches alternately between "*" and "-" each time the HDCP link check and encryption are executed.

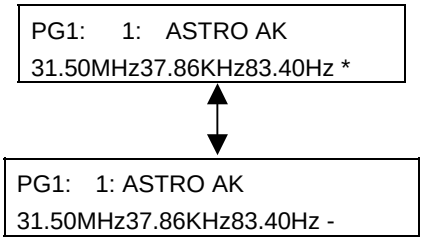


Fig. 5-14-3 HDCP execution

(5) When “Disp Mode” has been set to “NG Only” or “All” in Fig 5-12-2

The results are successively displayed on the monitor each time the HDCP execution and encryption are completed. They will appear as shown below when “ALL” is selected as the mode setting.

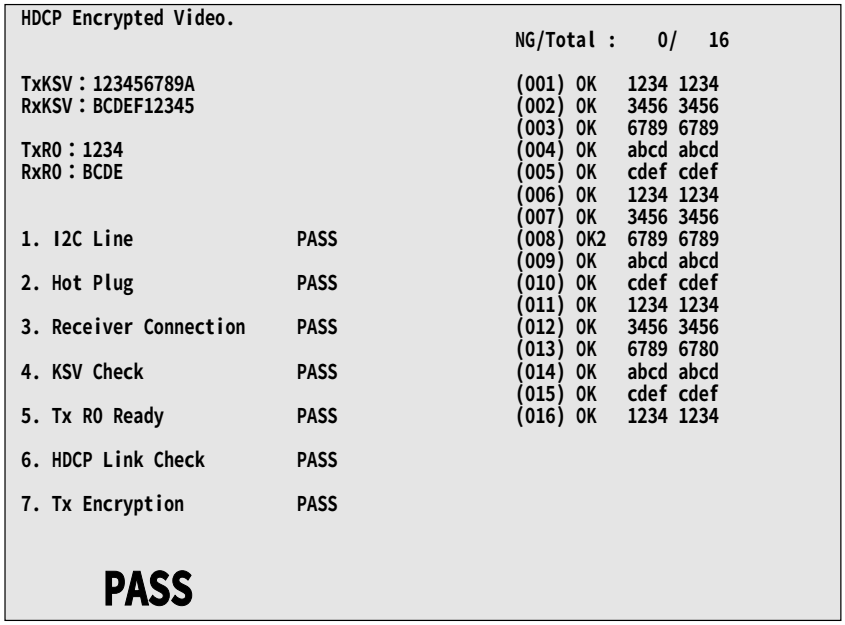


Fig. 5-14-4 HDCP execution underway screen (monitor)

The figures (last 3 digits) inside the parentheses indicate the number of link checks made. Since loading is initiated twice for the first link check, "OK" is displayed when the data is loaded for the first time and the anticipated value matches the link check value of the receiver, and "OK2" is displayed when this is the case with the second time. If the values fail to match at both times when after the data was, "NG!" is displayed. The loaded values are displayed using the hexadecimal format. Shown on the left are the anticipated values of the transmitter; shown on the right are the link check values of the receiver.

(6) When "Disp. Mode" has been set to "Pattern" in Fig. 5.12.2

The HDCP link check and encryption are executed with the pattern displayed on the monitor. The HDCP execution underway message is displayed at the top left of the monitor screen.

(7) If the HDCP link check should fail after HDCP encryption has commenced, images which are disrupted (by a type of interference that resembles snow) are output. With Ver1.1, resetting is not initiated even when the timing is switched. Once snow (see Note 1) has appeared, unplug the cables and then plug them back in or turn off the power at the receiving end. Alternatively, disable the HDCP of the generator again and set it back to enable. The error messages appear at the bottom of the LCD screen.

The following table lists the errors that may occur during HDCP execution

Table 5-14-1 HDCP errors

Code	Message	Description
51H	"HDCP Not Receiver"	The repeater is connected.
52H	"HDCP RiTimeout Error"	A timeout (250ms) has occurred in the Ri read instruction of the receiver.
53H	"HDCP Tx KSV Error"	The KSV of the transmitter contains twenty 0's and 1's.
54H	"HDCP Rx KSV Error"	The KSV of the receiver contains twenty 0's and 1's.
55H	"HDCP Link Check Error"	The values failed to match with the first link check.
56H	"HDCP Encrypt Error"	The encryption was not completed.
57H	"HDCP Hot Plug Error"	The DVI connector is not connected to the receiver. (Note 2)
58H	"HDCP Ri Ready Error"	The Ready bit of the receiver was not set to Hi.
59H	"HDCP DVIModeDual Err"	The DVI mode was set to dual.
5aH	"HDCP Hfp Error"	The H front porch is zero.
5bH	"HDCP Hbp Error "	The H back porch is zero.
5cH	"HDCP Hblank Error"	The H blanking period is under 128.
5dH	"HDCP Vfp Error"	The V front porch is zero.
5eH	"HDCP H-TIM Error"	H timing error.
5fH	"HDCP 1/2 Clock Mode"	The 1/2 clock mode timing data has been set.

(note1) white noise that resembles what is displayed on a TV screen when program broadcasting comes to an end.

(note2) If the receiver is connected again after a hot plug error has occurred, the HDCP link check and encryption are resumed.

5.15. How to set and execute calibration

The video output levels can be calibrated.

Press the [FUNC] key, [D] key and [SET] key.

```
Select Function: D   (0-E)
Calibration
```

Fig. 5.15.1 Selecting the function

(1) Adjusting the minimum and maximum voltage levels

1) Check that OFF is set for "AutoCalibration" on page 1 as shown below. If not, select OFF using the [0] key.

```
AutoCalibration ： OFF (0/1)
```

Fig. 5.15.2 1st page of function D (OFF)

2) Check that MIN is set for "DACOutput" on page 2. If not, select MIN using the [0] key.

```
DACOutput : MIN     (0/1)
```

Fig. 5.15.3 2nd page of function D (MIN)

3) The following display appears by pressing the [SET] key. In this status, the minimum DAC values are output for R, G and B.

```
DACOutput : MIN     (0/1)
DAC MIN OUT
```

Fig. 5.15.4 Screen showing minimum DAC value output

4) In the status established in step 3), measure the output voltages of R, G and B using an oscilloscope.
5) Press the [SET] key to stop the DAC output. The "DAC MIN OUT" display is now cleared.
6) Transfer to page 3, and enter the values measured in 4) mV units in the sequence of R, B and B from the left of the "Min" line.

```
MinR: -1000G: -1000B: -1000
MaxR:+1500 G:+1500B:+1500
```

Fig. 5.15.5 3rd page of function D

7) Return to page 2, and press the [1] key to display "MAX."

```
DACOutput : MAX     (0/1)
```

Fig. 5.15.6 2nd page of function D (MAX)

8) As in 3), press the [SET] key. "DAC MAX OUT" appears on line 2 of the screen in 3). In this status, the maximum DAC values are output for R, G and B.
9) In the status established in step 8), measure the output voltages of R, G and B using an oscilloscope.

10) As in 5), press the [SET] key to stop the DAC output.
11) As in 6), enter the values measured in 9) on the "Max" line.
12) Press the [SAVE] key to reflect the measured values in the VG-848. After the data has been saved, the "DACOUT VOLT DATA SAVE" message is displayed.

Caution

Please do not turn off the power before the LED of the “SAVE” key lights off. Otherwise, it may lead to a trouble.

(2) Automatic calibration execution

1) Check that ON is set for "AutoCalibration" on page 1 as shown below. If not, select ON using the [1] key.

```
AutoCalibration : ON (0/1)
```

Fig. 5.15.7 1st page of function D (ON)

2) Automatic calibration is started by pressing the [SET] key. During automatic calibration, "*" moves from left to right on the second line.

```
AutoCalibration : ON (0/1)
        *
```

Fig. 5.15.8 When automatic calibration is underway

3) When calibration is completed successfully, the following display appears.

```
AutoCalibration : ON (0/1)
Calibration End
```

Fig. 5.15.9 When automatic calibration is completed

If calibration is unsuccessful, the following display appears.

```
AutoCalibration : ON (0/1)
Calibration Error
```

Fig. 5.15.10 When automatic calibration is unsuccessful

Point

To forcibly terminate automatic calibration, press and hold down any key on the remote control unit. When automatic calibration is forcibly terminated, the following display appears, and the previously calibrated table is reflected.

```
AutoCalibration : ON (0/1)
Cal Compulsory Stop
```

Fig. 5.15.11 When automatic calibration is forcibly terminated

Caution

Please do not turn off the power during auto calibrtion. Otherwise, it may lead to a trouble.

5.16. IA-575 settings and execution

CAUTION

This function is an optional function.

The procedure below enables the connected IA-575 to be set.

Press the [FUNC] key, [E] key and [SET] key.

```
Select Function: E  (0-E)
IA-575
```

Fig. 5-16-1 Selecting the function

Caution

The screen shown in Fig. 5-16-1 appears even when the IA-575 is not connected, but the screen will not be changed even if the [SET] key is pressed.

*** For the detailed setting items and functions of the IA-575, refer to the instruction manual of the IA-575.**

6 Timing data configuration and setting procedures

6.1. Concerning the timing data

6.1.1. Configuration of timing data

The timing data is configured by the items shown in Tables 6.1.1, 6.1.2 and 6.1.3.

Table 6.1.1 Timing data

Timing data	Configuration	
Horizontal timing data	Input Mode (0,1) Dot Clock	0 : µS 1 : dot _ _ _._ _ MHz
	H period H disp	_ _. _ _ µSec _ _ _ _ dot _ _. _ _ µSec _ _ _ _ dot
	H sync□H backp	_ _. _ _ µSec _ _ _ _ dot _ _. _ _ µSec _ _ _ _ dot
	HD start HD width	_ _. _ _ µSec _ _ _ _ dot _ _. _ _ µSec _ _ _ _ dot
Vertical timing data	Input Mode (0,2) Scan Mode (0/2)	0 : H 1: mS 0 : NON INTERLACE 2 : INTERLACE & VIDEO
	V total V disp	_ _. _ _ _mSec _ _ _ _ H _ _. _ _ _mSec _ _ _ _ H
	V sync V backp	_ _. _ _ _mSec _ _. _H _ _. _ _ _mSec _ _ _ _ H
	EQP fp EQP bp	_ _. _ _ _mSec _ _. _H _ _. _ _ _mSec _ _. _H
	Serration (0 to 3)	0 : OFF 1 : 0.5H 2 : 1H 3 : EXOR
	EQP(0,1)	0 : OFF 1 : ON

Table 6.1.2 Analog output conditions

Output condition	Configuration	
nalog output conditions	Output Mode(0~6)	0 : ANALOG 1 : TR1080 2 : TR1035 3 : TR720 4 : NTSC 5 : PAL 6 : SECAM
	CV (0 to 7)	0 : None 1 : R 2 : G 3 : RG 4 : B 5 : RB 6 : GB 7 : RGB
	HS VS CS	0 : Nega 1 : Posi
	Video Set up Sync RGB/YPbPr YPbPr No.	_ . _ _ V _ . _ _ V _ . _ _ V 0 : RGB 1 : YPbPr (0 to 9) coefficient table numbers
	D-Connector Line 1 Line 2 Line 3	0 : 480 1 : 720 2 : 1080 0 : Interlace 1 : Progressive 0 : 4:3 1 : 4:3LB 2 : 16:9
	Analog BNC Analog D-SUB	0 : OFF 1 : ON 0 : OFF 1 : ON
	DVI-D DVI-A D-Connector	0 : OFF 1 : ON 0 : OFF 1 : ON 0 : OFF 1 : ON
	S-Connector	0 : NORMAL 1 : LETTER BOX 2 : SQUEEZE
	DVI Mode	0 : SINGLE 1 : DUAL
	Aspect Mode	0 : 4:3 1 : 16:9 2 : Reso 3 : User H : V : (1〜255)

Table 6.1.3 Audio output conditions

Audio output conditions	Configuration	
Audio output conditions	FREQ L FREQ R	_ _ _ _ _Hz _ _ _ _ _ Hz
	LEVEL L LEVEL R	_ _ _ _ mV _ _ _ _ mV
	SWEEP	0: OFF 1: FREQ 2: LEVEL R 3: LEVEL L
	SWEEP SWEEP STEP SWEEP TIMES	0 : OFF 1 : FREQ 2 : LEVEL R 3 : LEVEL L _ _msec 1〜15
	FREQ SWEEP FREQ STEP	MIN : _ _ _ _Hz MAX : _ _ _ _Hz _ _ _Hz

The setting ranges of the timing data are listed below.

Table 6.1.4 Timing data setting ranges

Setting item		Setting range			
Frequency	Dot clock frequency	5.00 to 300.00 MHz			10 kHz increments
	Horizontal sync frequency	10 kHz and up			
	Vertical sync frequency	15.6 Hz and up			
Horizontal timing data	H PERIOD	0.00 to 99.99μSec	128 to 8192dot		1-dot increments
	H DISP	0.00 to 99.99μSec	48 to 4096dot		1-dot increments
	H SYNC	0.00 to 99.99μSec	0 to 4096dot		1-dot increments
	H BACK P H FRONT P *4, 7	0.00 to 99.99μSec	0 to 4096dot		1-dot increments
	HD START HD WIDTH*1	0.00 to 99.99μSec	0 to 4096dot		1-dot increments
	H BLANKING	Automatically calculated	40 to 4096dot		1-dot increments
Vertical timing data	V TOTAL	0.000 to 99.999mS	4 to 8192H	non-interlaced (progressive)	1H increments
			4 to 4096H	Interlaced	
	V DISP	0.000 to 99.999mS	1 to 4096H		
	V BACK P V front P	0.000 to 99.999mS	0 to 4096H		
	V SYNC	0.000 to 99.999mS	1.0 to 99.0H		0.5H increments
	EQP FP EQP BP *7,9	0.000 to 99.999mS	0.0 to 99.0H		
	VD START VD LINE*2	0.000 to 99.999mS	0.0 to 4095.0H		
	V BLANKING		2H or more		

*1: The sum of HD-START and HD-WIDTH cannot be set in excess of H-PERIOD.
(*The settings can be edited to ensure data compatibility with other models, but they will be ignored by the VG-848.)
Set the sum within the following range: (HD-START + HD-WIDTH) <= H-PERIOD

*2: The sum of VD-START and VD-LINE cannot be set in excess of V-total.
(* The settings can be edited to ensure data compatibility with other models, but they will be ignored by the VG-848.)
Set the sum within the following range: （VD START + VD LINE） <= V TOTAL
The settings can be edited to ensure data compatibility with other models, but they will be ignored by the VG-848.

*3: Then "0" is set for H FRONT P:
Set H SYNC to 2 dots or more when the dot clock frequency is 100 to 200 MHz.
Set it to 4 dots or more when the dot clock frequency is 200 to 300 MHz.

*4: The setting range is 64 to 4096 dots when the dot clock frequency of H FRONT P is 100 to 200 MHz and H PERIOD is set in increments of other than 2 dots, and it is 128 to 4096 dots when the dot clock frequency is 200 to 300 MHz and H PERIOD is set in increments of other than 4 dots.

*5: 1/2H display is not possible for TV system signals, etc.

*6: The VBS and Y/C signals are output only when fixed TV system signals are output.

*7: When the interlace is selected, “0” can not be set as H FRONTP.
The setting of the dot clock and H FRONT P should be as below:
up to 100MHz : 2dots or more, up to 200MHz : 4dots or more, up to 400MHz : 8dots or more.

*8: When non-interlace (progressive) and tri-level SYNC are selected, 0.5H can not be set as EQP, FP/B P and serration.

*9 When the interlace and tri-level SYNC are selected, the setting should not be EQP FP + 1H > H FRONT P.

Restrictions on DVI output timing

In addition to the fore-mentioned restrictions, the following restrictions apply to the dot clock frequency and horizontal timing data for DVI output.

Mode	Setting item	Restriction on setting
Single link	Dot clock frequency	25 to 165 MHz
	All horizontal timing data	25 to 100 MHz: 1-dot increments 100 to 165 MHz: 2-dot increments
Dual link	Dot clock frequency	50 to 300MHz
	All horizontal timing data	25 to 100 MHz: 2-dot increments 100 to 165 MHz: 4-dot increments in all area.

6.1.2. Selection method

(1) With the program data selected by the PC card edit function (refer to "Editing the program data (program edit, PC card edit)" in 5.4), press the [TIMING] key.

The LED of the [TIMING] key blinks.

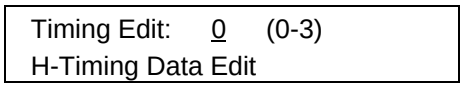


Fig. 6.1.1 Selecting the timing data

(2) While referring to the table below, select the timing data to be edited, and press the [SET] key to set the details.

The LED of the [TIMING] key lights.

Table 6.1.4 Selection method

Key	LCD display	Timing data	Ref. page no.
0	H-Timing Data Edit	Horizontal timing data	p.85
1	V-Timing Data Edit	Vertical timing data	p.87
2	Analog Output Condition	Analog output condition data	p.93
3	Audio Data Edit	Audio output condition data	p.100

Point

- If the [ESC] key is pressed instead, operation returns to the pattern selection screen.
- To register the settings on the PC card, press the [SAVE] key to save them.

6.2. Setting the horizontal timing data

6.2.1. Horizontal timing data

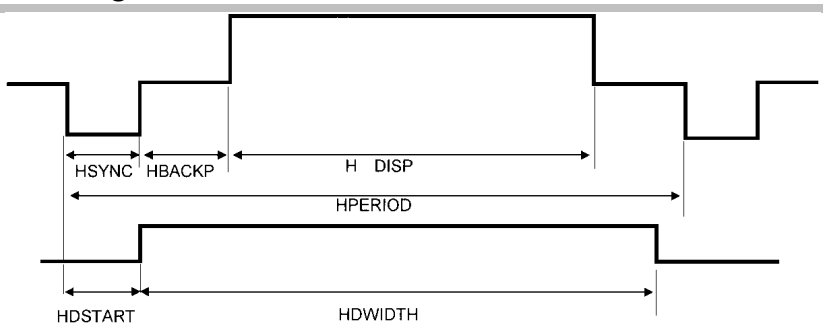


Fig. 6.2.1 Horizontal timing data

6.2.2. Editing the data

(1) Set the input mode and dot clock frequency.

H-Input Mode:dot (0/1)
Dot Clock : 74.97MHz

Fig. 6.2.2 Setting the input mode and dot clock frequency

Table 6.2.1 Setting items

Setting item	Key operation	General description
H-Input Mode	0	In this input mode, the data is input in microseconds. * When this mode is selected, dots can no longer be input for H-sync, H-back-porch, HD-start and HD-width.
	1	In this input mode, the data is input in dots. * When this mode is selected, microseconds are only displayed.
Dot Clock	Number key	• Setting range: 5.00 to 300.00 (MHz) • When the "C" ([SHIFT] + [6]) key is pressed, "*" appears on the display, and the setting can be fixed.

Point

- When the dot input mode has been selected: For the dot clock frequency input, the microsecond settings are re-calculated without changing the dot item of each data. For the input of other items, the microsecond setting items are re-calculated on the basis of the dot items of the input data.
- When the microsecond input mode has been selected: For the dot clock frequency input, the number of dots for each item is calculated in such a way that the microseconds of each item remain unchanged, and the microseconds of each item are then re-calculated from the number of dots thereby obtained. (The dot clock frequency is compensated for in such a way that the Hperiod microsecond setting remains unchanged.) For the input of other items, the dot items are calculated on the basis of the microsecond items of the input data, and the microsecond items are then re-calculated on the basis of the dot items thereby obtained. (The dot clock frequency is compensated for in such a way that Hperiod and Hdisp are set optimally for the input microsecond settings.)
- The settings for the dot clock frequency, H-period and H-disp can be fixed. When they have been fixed, they take priority over the input mode and become effective.

(2) Set H-period and H-disp.

Even when the data is set in microseconds, the settings must be inside the setting ranges for the number of dots.

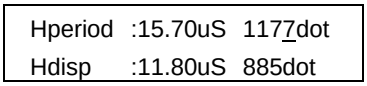


Fig. 6.2.3 Setting H-period and H-disp

Table 6.2.2 Setting items

Setting item	Key operation	General description
Hperiod	Number keys	• Setting range: 0.00 to 99.00 (us), 128 to 8192 (dots) • When the "E" ([SHIFT) + [8]) key is pressed, "*" appears on the LCD display, and the microsecond setting can be fixed. • When the "F" ([SHIFT) + [9]) key is pressed, "*" appears on the LCD display, and the dot setting can be fixed.
Hdisp	Number keys	• Setting range: 0.00 to 99.00 (us), 48 to 4096 (dots) • When the "B" ([SHIFT) + [5]) key is pressed, "*" appears on the LCD display, and the microsecond setting can be fixed. • When the "C" ([SHIFT) + [6]) key is pressed, "*" appears on the LCD display, and the dot setting can be fixed.

(3) Set H-sync and H-back-porch.

Even when the data is set in microseconds, the settings must be inside the setting ranges for the number of dots.

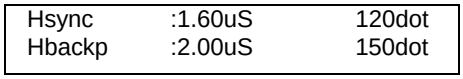


Fig. 6.2.4 Setting H-sync and H-back-porch

Table 6.2.3 Setting items

Setting item	Key operation	Setting range
Hsync	Number key	0.00 to 99.99 (μS), 0 to 4096 (dot)
Hbackp	Number keys	0.00 to 99.99 (μS), 0 to 4096 (dot)

Caution

H-front-porch is automatically calculated from H-period, H-disp, H-sync and H-back-porch, but it must be within the same range as H-back-porch.

(4) Set HD-start and HD-width.

HDstart:0.00uS 0dot
HDwidth:0.00uS 0dot

Fig. 6.2.4 Setting HD-start and HD-width

Table 6.2.4 Setting items

Setting item	Key operation	Setting range
HDstart	Number key	0.00 to 99.99μS, 0 to 4096dot
HDwidth	Number key	0.00 to 99.99μS, 0 to 4096dot

Caution

The sum of HD-start and HD-width cannot be set in excess of H-period.
(* The settings can be edited to ensure data compatibility with other models, but they will be ignored by the VG-848.)
Set the sum within the following range:
(HD-start+HD-width <= H-period)

6.3. Setting the vertical timing data

6.3.1. Vertical timing data

■ In the non-interlaced scanning mode

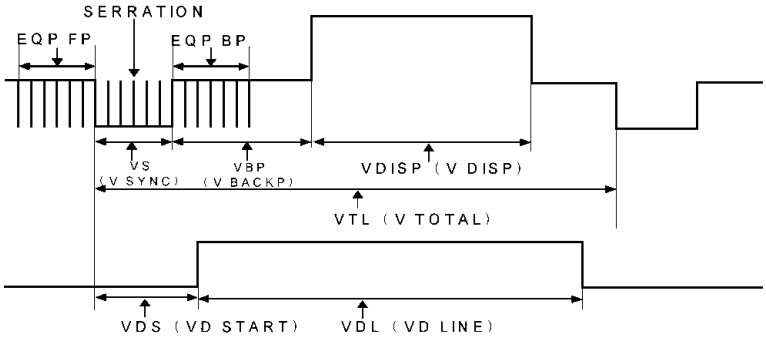


Fig. 6.3.1 Non-interlaced scanning

■ In the interlaced scanning mode

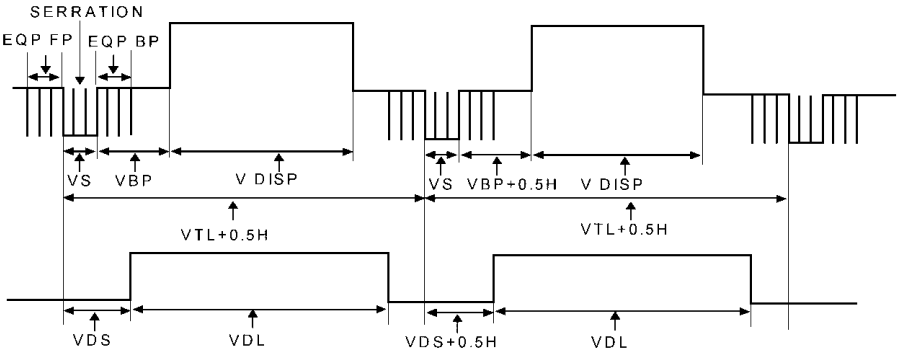


Fig. 6.3.2 Interlaced scanning

6.3.2. Editing the data

(1) Set the input mode and scanning mode.

V-Input Mode:H	(0/1)
..Scan:Non Interlace	(0-1)

Fig. 6.3.3 Setting the input mode and scanning mode

Table 6.3.1 Setting items

	Key operation	General description
V-Input Mode	0	In this input mode, the data is input in H increments. * When this mode is selected, microseconds are only displayed.
	1	In this input mode, the data is input in microseconds. * When this mode is selected, the H increments are only displayed.
Scan	0	The scanning mode is set to non-interlaced scanning.
	1	The scanning mode is set to interlaced & video scanning.
	2	The scanning mode is set to interlaced & sync scanning.

Point

- When the input mode is set for data input in H increments, the microseconds are re-calculated in such a way that the H items of the data remain unchanged.
- When the input mode is set for data input in microseconds, basically, the H items are calculated in such a way that the microsecond item of each data remains unchanged, and the microsecond settings are then re-calculated from the number of H and horizontal period thereby obtained.
- The settings for V-total and V-disp can be fixed. When they have been fixed, they take priority over the input mode and become effective.

The differences between the non-interlaced and interlaced & video scanning modes are shown below.

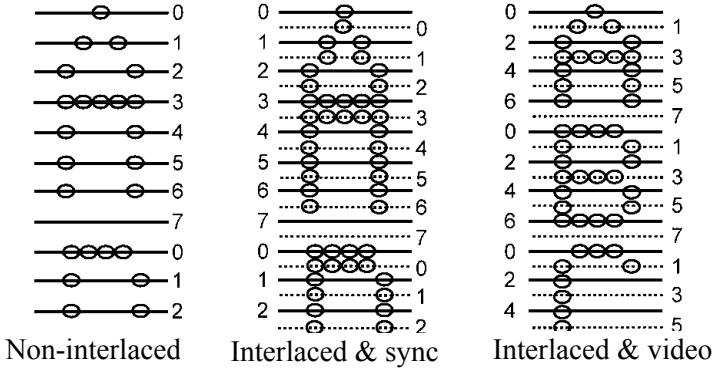


Fig. 6.3.4 Differences in scanning modes

Point

When interlaced scanning has been selected, set the number of lines scanned per field in the vertical timing data items.

(2) Set V-total-line and V-disp-Line.

Vtotal	:16.657mS	1061H
Vdisp	:16.076mS	1024H

Fig. 6.3.5 Setting V-total-line and V-disp-Line

Table 6.3.2 Setting items

Setting item	Key operation	General description
Vtotal	Number keys	• Setting range for non-interlaced scanning: 4 to 8192 (1H increments) • Setting range for interlaced scanning: 4 to 4096 (1H increments) • When the "E" ([SHIFT) + [8]) key is pressed, "*" appears on the LCD display, and the microsecond setting can be fixed. • When the "F" ([SHIFT) + [9]) key is pressed, "*" appears on the LCD display, and the H setting can be fixed.
Vdisp	Number keys	• Setting range: 1 to 4096 (1H increments) • When the "B" ([SHIFT) + [5]) key is pressed, "*" appears on the LCD display, and the microsecond setting can be fixed. • When the "C" ([SHIFT) + [6]) key is pressed, "*" appears on the LCD display, and the H setting can be fixed.

(3) Set V-sync and V-back-porch.

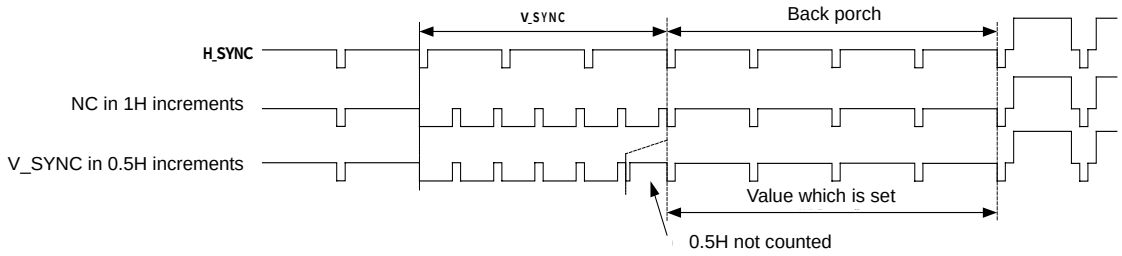
Vsync	:0.047mS	3.0H
Vbackp	:0.502mS	32H

Fig. 6.3.6 Setting V-sync and V-back-porch

Table 6.3.3 Setting items

Setting item	Key operation	Setting range
Vsync	Number keys	1.0 to 99.0 (0.5H increments)
Vbackp	Number keys	0 to 4000 (1H increments)

Approach taken to back porch



(4) Set EQP Serration Pulse

EQPfp	:0.000mS 0.0H
EQPbp	:0.000mS 0.0H

Fig. 6-3-7 EQP Serration pulse setting

Table 6-3-4 Setting Items

Setting item	Key operation	Setting range
EQPfp	Number keys	• Within the range of serration pulse in a Front Porch. • Setting range : 0.0 to 99.0 (0.5H increments)
EQPbp	Number keys	• Within the range of serraion pulse in a Back Porch. • Setting range : 0.0 to 99.0 (0.5H increments)

Caution

- When the interlace is selected, "0" can not be set as H FRONTP.

The setting of the dot clock and H FRONT P should be as below:

up to 100MHz : 2dots or more, up to 200MHz : 4dots or more, up to 400MHz : 8dots or more.

- When non-interlace (progressive) and tri-level SYNC are selected, 0.5H can not be set as EQP, FP/B P and serration.
- When the interlace and tri-level SYNC are selected, the setting should not be EQP FP + 1H > H FRONT P.

The below figure shows the aspect relation of EQP and definition.

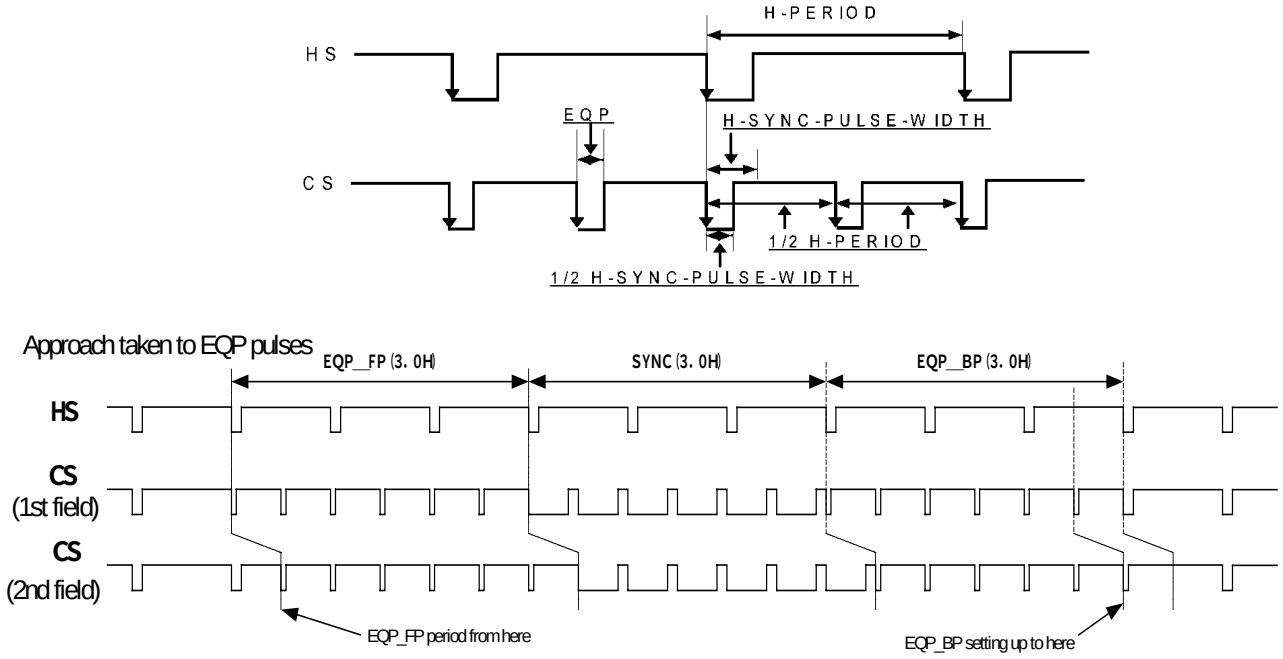


Fig. 6-3-8 the aspect relation of EQP and definition.

These are 4 examples of EQP setting.

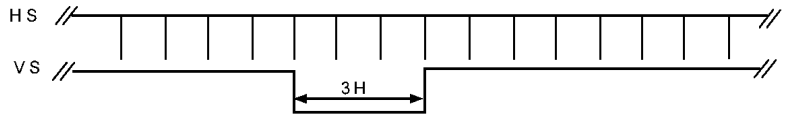


Fig. 6-3-9 EQP

<e.g. 1>

Table 6-3-5 Setting value1

Setting Item	Setting value
EQP-FP	0H
EQP-BP	0H
EQP	OFF
SERRATION	OFF

Fig. 6-3-10 Setting example 1

<e.g.2>

Table 6-3-6 Setting value 2

Setting Item	Setting value
EQP-FP	0H
EQP-BP	0H
EQP	OFF
SERRATION	0.5H

Fig. 6-3-11 Setting 2

<e.g.3>

Table 6-3-7 Setting 3

Setting Item	Setting value
EQP-FP	3H
EQP-BP	3H
EQP	ON
SERRATION	1H

Fig. 6-3-12 Setting example 3

<e.g. 4>

Table 6-3-8 Setting 4

Setting Item	Setting value
EQP-FP	3H
EQP-BP	0H
EQP	OFF
SERRATION	OFF

Fig. 6-3-13 Setting Example 4

(5) Set SERRATION.

Serration :OFF
(0/2)
EQP (on/off) :OFF (0/1)

Fig. 6-3-14 Setting SERRATION and equalizing pulse

Table 6-3-9 Setting Item

Setting item	Key operation	Setting range
Serration	0	OFF
	1	0.5H
	2	1H
	3	EXOR
EQP	0	OFF
	1	ON

The aspect relation of SERRATION is shown as below.
<e.g.>

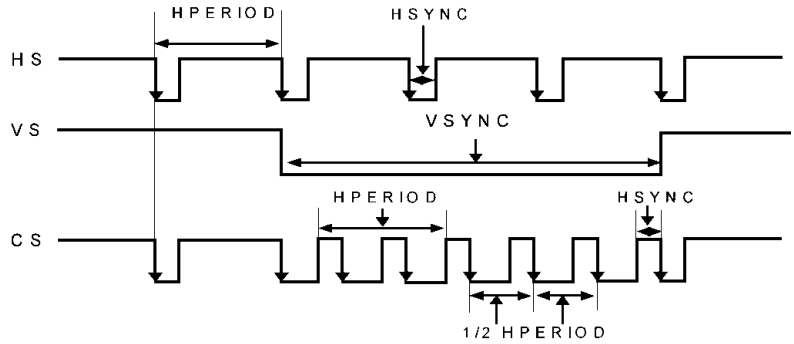


Fig. 6-3-15 when 0.5H is selected

(6) Set VD-Startline and VD-Line.

VDstart	:0.000mS	0.0H
VDline	:0.000mS	0.0H

Fig. 6.3.8 Setting VD-Startline and VD-Line

Table 6.3.5 Setting items

Setting item	Key operation	Setting range
VDstart	Number keys	0.0 to 4095.0 (0.5H increments) (VDstart ≤ V-total - 1H)
VDline		0.0 to 4095.0 (0.5H increments) (VDstart ≤ V-total)

Caution

The sum of VD-start and VD-line cannot be set in excess of V-total.
(* The settings can be edited to ensure data compatibility with other models, but they will be ignored by the VG-848.)
Set the sum within the following range:
(VD-start+VD-width <= V-period)

6.4. Setting the analog output condition data

(1) Set the output mode of SYNC signal.

OutputMode：ANALOG (0-6)

Fig. 6-4-1 set the output mode of SYNC signal

Table 6-4-1 Setting Items

Key	LCD display	Description	Note
0	ANALOG	Set it bi-level mode.	This is the usual using setting.
1	TRI1080	Set it tri-level signal output mode 1080 type.	• The first fiels becomes the first line of DISP. • Refer to the program # 970 to 973 as to 1080 standard timings.
2	TR1035	Set it tri-level signal output mode 1035 type.	• The second field becomes the first line of DISP. • Add 1 to the second field of V DISP setting value. Therefore, the total value of V DISP in one field is an odd number. • Refer to the program # 974 to 975 as to 1035 standard timings.
3	TR720	Set it tri-level signal output mode 720 type.	• Refer to the program # 976 to 977 as to the standard timings.
4	NTSC	Set it NTSC output mode.	• VBS output is automatically set ON. • If the SYNC signal is set different from that of internal program timings (except the timing setting items of DISP and BP), the VBS output is set OFF. • Refer to the program # 950 and 968 as to 720 standard timings.
5	PAL	Set it PAL output mode.	• VBS output is automatically set ON. • If the SYNC signal is set different from that of internal program timings (except the timing setting items of DISP and BP), the VBS output is set OFF. • Refer to the program # 969 as to the standard timings.

6	SECAM	Set it SECAM output mode.	• VBS output is automatically set ON. • If the SYNC signal is set different from that of internal program timings (except the timing setting items of DISP and BP), the VBS output is set OFF. • Refer to the program # 964 as to the standard timings.

(2) Set the polarities of the composite video signals and output polarities.

CV:RGB	(0-7)	CS:N	(0-2)
HS:N	(0-2)	VS:N	(0-2)

Fig. 6.4.2 Setting the composite video signals and output polarities

Table 6.4.2 Setting items

Setting item	Key operation	LCD display	General description
CV	0	OFF	OFF
	1	R	The composite sync signal is carried on R.
	2	G	The composite sync signal is carried on G.
	3	R G	The composite sync signal is carried on R/G.
	4	B	The composite sync signal is carried on B.
	5	R B	The composite sync signal is carried on R/B.
	6	G B	The composite sync signal is carried on G/B.
	7	R G B	The composite sync signal is carried on R/G/B.
CS	0	N	Negative
	1	P	Positive
	2	-	OFF
	3	HS	Set the HS sync.
	4	VS	Set the VS sync.
HS	0	N	Negative
	1	P	Positive
	2	-	OFF
	3	CS	Set the CS sync.
VS	0	N	Negative
	1	P	Positive
	2	-	OFF

Point

Each synchronized signal from CS connector is outputted on an analog level (0.3V).
*In the case of tri-level sync signal output, it is set to 0.6V.

Point

Each synchronized signal from HS connector is outputted on a TTL level (2V).

(3) Set the video, setup and sync signal levels.

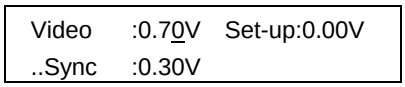


Fig. 6.4.3 Setting the levels

Table 6.4.3 Setting items

Setting item	Key operation	General description
Video	Number keys	• Video signal level • Setting range: 0.30 to 1.20V (0.01V increments)
Set-up	Number keys	• Setup level • Setting range: 0.00 to 0.25V (0.01V increments)
Sync	Number keys	• Sync (G on sync) signal level • Setting range: 0.00 to 0.60V (0.01V increments)

(4) Select RGB signals or YPbPr (color difference) signals as the output.

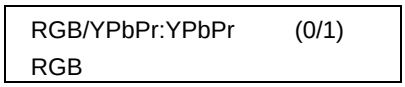


Fig. 6.4.4 Selecting the output

Table 6.4.4 Selection method

Key operation	LCD display	General description
0	RGB	RGB signals are output.
1	YpbPr	YPbPr (color difference) signals are output.

(5) Set the YPbPr output table.

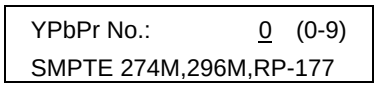


Fig. 6.4.5 Setting the table

Table 6.4.5 Setting items

Key operation	Table
0	SMPTE 274M, 296M, RP-177
1	SMPTE 240M
2	SMPTE 293M
3	SMPTE 125M
4 to 9	User setting (*1)

*1: For details on the user settings, refer to "Setting the color difference coefficients (YPbPr coefficient table editing)" in 5.9.

(6) Select the identification signal for D connector line 1.

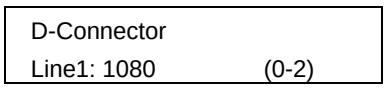


Fig. 6.4.6 Selecting the line 1 identification signal

Table 6.4.6 Selection method

Key operation	LCD display	General description
0	480	Number of effective scanning lines: 480 (ID voltage: 0V)
1	720	Number of effective scanning lines: 720 (ID voltage: 2.2V)
2	1080	Number of effective scanning lines: 1080 (ID voltage: 5V)

(7) Select the identification signals for D connector line 2 and line 3.

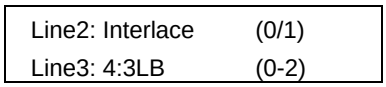


Fig. 6.4.7 Selecting the line 2 and line 3 identification signals

Table 6.4.7 Setting items

Setting item	Key operation	LCD display	General description
Line2	0	Interlace	Interlaced scanning (ID voltage: 0V)
	1	Progressive	Progressive scanning (ID voltage: 5V)
Line3	0	4:3	4:3 aspect ratio (ID voltage: 0V)
	1	4:3LB	4:3 letter-box aspect ratio (ID voltage: 2.2V)
	2	16:9	16:9 aspect ratio (ID voltage: 5V)

(8) Select whether to output the signals to the BNC connectors and D-Sub connector.

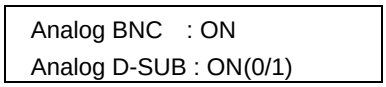


Fig. 6.4.8 Selecting the BNC and D-Sub connector output

Table 6.4.8 Setting items

Setting item	Key operation	LCD display	General description
Analog BNC Analog D-SUB	0	OFF	The signals are not output.
	1	ON	The signals are output.

(9) Select whether to output the signals to the DVI connector and D connector.

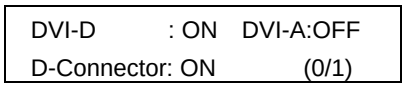


Fig. 6.4.9 Selecting the DVI and D connector output

Table 6.4.9 Setting items

Setting item	Key operation	LCD display	General description
DVI-D	0	OFF	Digital signals are not output from this DVI output connector.
	1	ON	Digital signals are output from this DVI output connector.
DVI-A	0	OFF	Analog signals are not output from this DVI output connector.
	1	ON	Analog signals are output from this DVI output connector.
D-Connector	0	OFF	No signals are output from the D connector.
	1	ON	Signals are output from the D connector.

(10) Select the S connector output format.

S-Connector : NORMAL
(0-2)

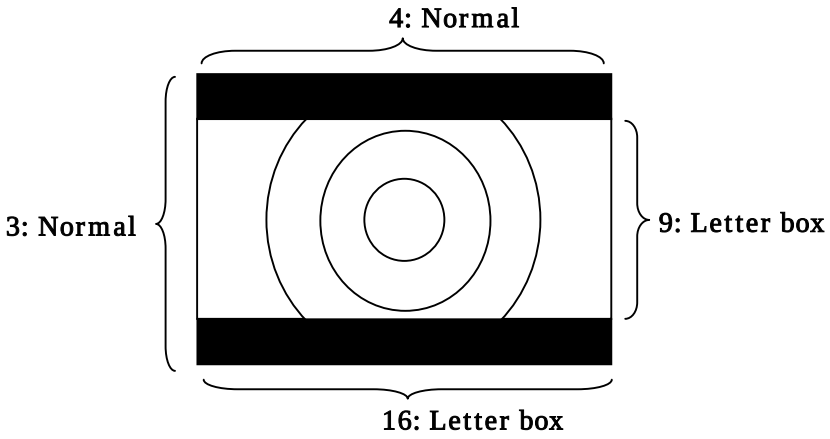
Fig. 6.4.10 Selecting the S connector output format

Table 6.4.10 Setting items

Key operation	LCD display	General description
0	NORMAL	Normal output
1	LETTER BOX	Letter-box
2	SQUEEZE	Squeeze

***1 Usually the picture is output by 4:3 ratio, however when selecting the "letter box", the picture ration is 16:9. The upper and lower side is shown black as the below illustration shows.**

When the letter box is selected, the output picture is as below.



(11) Select the DVI output mode.

DVI Mode :SINGLE
(0/1)

Fig. 6.4.11 Selecting the DVI output mode

Table 6.4.11 Setting items

Setting item	Key operation	LCD display	General description
DVI Mode	0	SINGLE	The signals are output in the single mode.
	1	DUAL	The signals are output in the dual link mode.

(12) Selecting the drawing aspect ratio

The aspect ratio at which the patterns are drawn can be set.

This setting takes effect only when circles are output or when optional patterns No.7, 8, 9, 17, 25, 26, 34 or 3D are output.

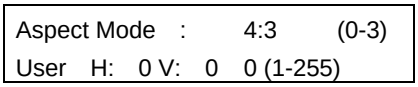


Fig.6.4.12 Aspect Mode/User setting screen

Table 6.4.12 Setting items

Key	LCD Display	Description
0	4:3	The aspect ratio is set to 4:3.
1	16:9	The aspect ratio is set to 16:9.
2	Reso	The same aspect ratio as for the screen resolution is set.
3	User	The aspect ratio which has been input on the second line of the setting screen shown above is set.

6.5. Setting the audio output data

(1) Set the output frequency

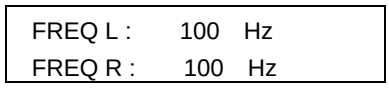


Fig. 6.5.1 Setting the output frequency

Table 6.5.1 Setting items

Setting item	Key operation	General description
FREQ L FREQ R	Number keys	• Setting range: 100 to 20000 (100 Hz increments)

(2) Set the output levels.

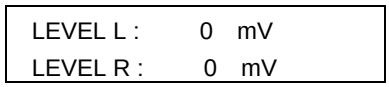


Fig. 6.5.2 Setting the levels [polarities???]

Table 6.5.2 Setting items

Setting item	Key operation	General description
LEVEL L LEVEL R	Number keys	• Setting range: 0 to 2000 (50mV increments)

(3) Select the SWEEP setting.

Fig. 6.5.3 Setting SWEEP

Table 6.5.3 Setting items

Setting item	Key operation	LCD display	General description
SWEEP	0	OFF	Sweep OFF
	1	FREQ	Frequency sweep
	2	LEVEL R	Level sweep from right to left
	3	LEVEL L	Level sweep from left to right

Caution

Do not set pattern action data while the sweep function is working.

(4) Set the stems numbers of frequency SWEEP.

SWEEP STEP :20 msec (0-F)
SWEEP TIMES: 0 (0-15)

Fig. 6-5-4 Setting of step numbers

Table 6.5.4 Setting item

Setting item	Kep operation	LCD display	Description
SWEEP STEP	0	40	Update time set up per one step is 40msec.
	1	60	Update time set up per one step is 60msec.
	2	80	Update time set up per one step is 80msec.
	3	100	Update time set up per one step is 100msec.
	4	120	Update time set up per one step is 120msec.
	5	140	Update time set up per one step is 140msec.
	6	160	Update time set up per one step is 160msec.
	7	180	Update time set up per one step is 180msec.
	8	200	Update time set up per one step is 200msec.
	9	220	Update time set up per one step is 220msec.
	A	240	Update time set up per one step is 240msec.
	B	260	Update time set up per one step is 260msec.
	C	280	Update time set up per one step is 280msec.
	D	300	Update time set up per one step is 300msec.
	E	320	Update time set up per one step is 320msec.
	F	340	Update time set up per one step is 340msec.
SWEEP TIMES	Number keys		• Setting range: 0 to 15 Set update times per one frequency. When setting “0”, it repeats unlimitedly.

Caution

During execution of SWEEP function, do not carry out action setting of pattern.

(5) Set the max and minimum value of frequency SWEEP.

FREQ SWEEP (200-2000) MIN: 100Hz MAX:20000Hz

Fig. 6.5.5 Setting max and minimum value

Table 6.5.5 Setting item

Setting item	Kep operation	Description
MIN MAX	Number keys	• Setting range: 200 to 20000 (100Hz increment)

During execution of SWEEP function, do not carry out action setting of pattern.

(6) Set the update step of frequency SWEEP

FREQ SWEEP (200-19800) STEP:19800Hz

Fig. 6.5.6 Setting of update step

Table 6.5.6 Setting item

Setting item	Kep operation	Description
STEP	Number keys	• Setting range: 200 to 19800 (100Hz increment)

During execution of SWEEP function, do not carry out action setting of pattern.

7 Pattern data types and setting procedures

7.1. How to select the pattern data

(1) With the program data selected by the PC card edit function (refer to "Editing the program data (program edit, PC card edit)" in 5.4), press the [PAT] key.

The LED of the [PAT] key blinks.

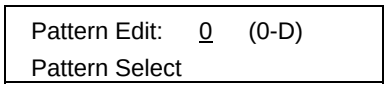


Fig. 7.1.1 Selecting the pattern data

(2) While referring to the table below, select the pattern data to be edited, and press the [SET] key to set the details.

The LED of the [PAT] key lights.

Table 7.1.1 Pattern data

Key	LCD display	Pattern data	Ref. page no.
0	Pattern Select	Pattern select	p.104
1	Graphic Color	Graphic color	p.104
2 / CHARA	CHARA Data Edit	Character pattern	p.105
3 / CROSS	CROSS Data Edit	Crosshatch pattern	p.107
4 / DOTS	DOTS Data Edit	Dot pattern	p.109
5 / CIRCLE	CIRCLE Data Edit	Circle pattern	p.112
6 / COLOR	COLOR Data Edit	Color bar pattern	p.114
7 / GRAY	GRAY Data Edit	Gray scale pattern	p.117
8 / BURST	BURST Data Edit	Burst pattern	p.118
9 / WINDOW	WINDOW Data Edit	Window pattern	p.119
A / OPT1	OPT1 Data Edit	Optional pattern 1	p.123
B / OPT2	OPT2 Data Edit	Optional pattern 2	p.123
C / CURSOR	CURSOR Data Edit	Cursor pattern	p.124
D / NAME	NAME Data Edit	Program name	p.126
E	ACTION Data Edit	Pattern action	p.127

Point

- If the [ESC] key is pressed instead, operation returns to the pattern selection screen.
- To register the settings on the PC card, press the [SAVE] key to save them.

7.2. Setting pattern select

(1) Select the pattern which is to be output.

Press the pattern key and output control key (RGB/INV). When a pattern is selected, the LED of its corresponding key lights.

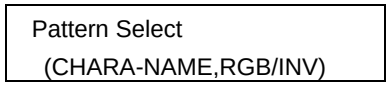


Fig. 7.2.1 Selecting the pattern

(2) To check the setting, press the [SET] key.

The pattern now appears on the display.

Point

When all pattern is OFF (solid pattern) , press [INV] key to make it inversed, and press [LEVEL] key. Then, by using [INC] and [DEC] key, the pattern level can be changed.

7.3. Setting graphic color

(1) Select the graphic color setting.

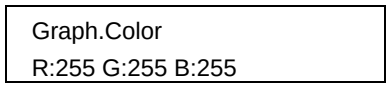


Fig. 7.3.1 Setting graphic color

Table 7.3.1 Setting item

Setting item	Key operation	Setting range
R, G, B	Number keys	0 to 255

(2) Set the background color.

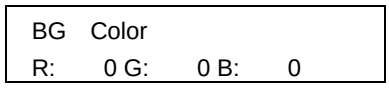


Fig. 7.3.2 Setting the background color

Table 7.3.2 Setting item

Setting item	Key operation	Setting range
R, G, B	Number keys	0 to 255

7.4. Setting the character pattern

(1) Set the format and font.

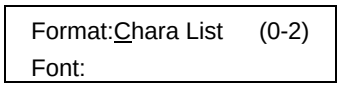


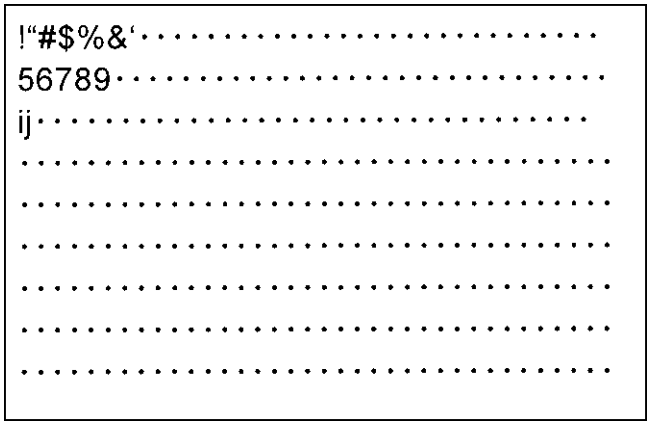
Fig. 7.4.1 Setting the format and font

Table 7.4.1 Setting items

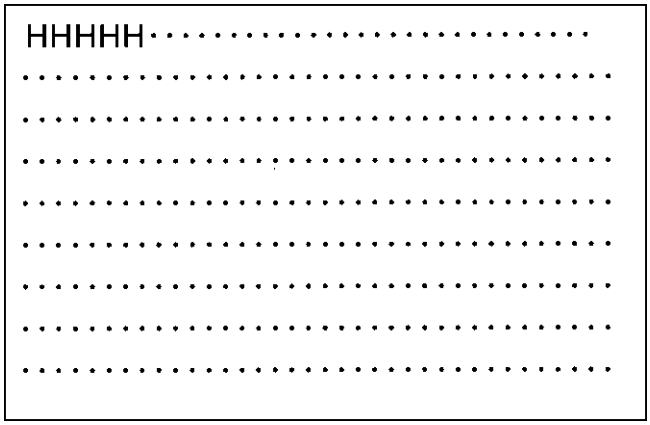
Setting item	Key operation	LCD display	General description
Format	0	Chara List	Character list
	1	All 1 Chara	All one character
	2	Corner & Center	Corner & center
Font	0	5×7	Setting range: 5 x 7
	1	7×9	Setting range: 7 x 9
	2	16×16	Setting range: 16 x 16

The formats are shown below.

<Character list>



<All one character>



<Corners & center>

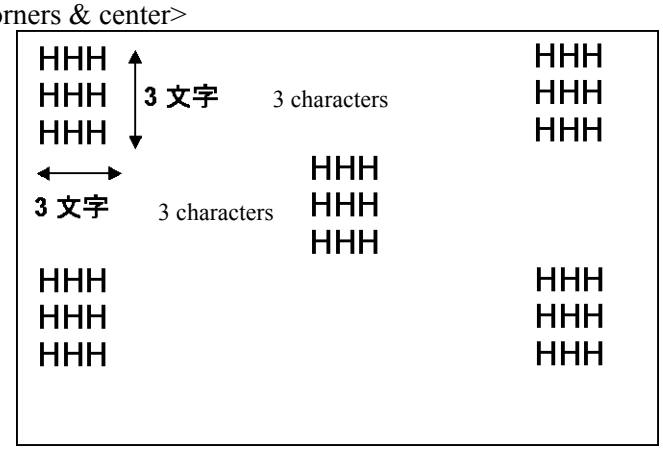


Fig. 7.4.2 Format

(2) Set the character code and cell size (horizontal, vertical).

Code:	48[H]	(20H-FFH)
Cell:	16* 16	(1-255)

Fig. 7.4.3 Setting the character code and cell size

Table 7.4.2 Setting item

Setting item	Key operation	Setting range
Code	Number keys, [SHIFT] key *1	20 to FF
Cell	Number keys	• Cell size (horizontal): 1 to 255 • Cell size (vertical): 1 to 255

*1 : The code can also be input from the display. (Refer to "How to input character codes from the display" in 5.10.)

The correlation between the font and cell size is shown below.

<Example with 7x9 font and 16x16 cell size>

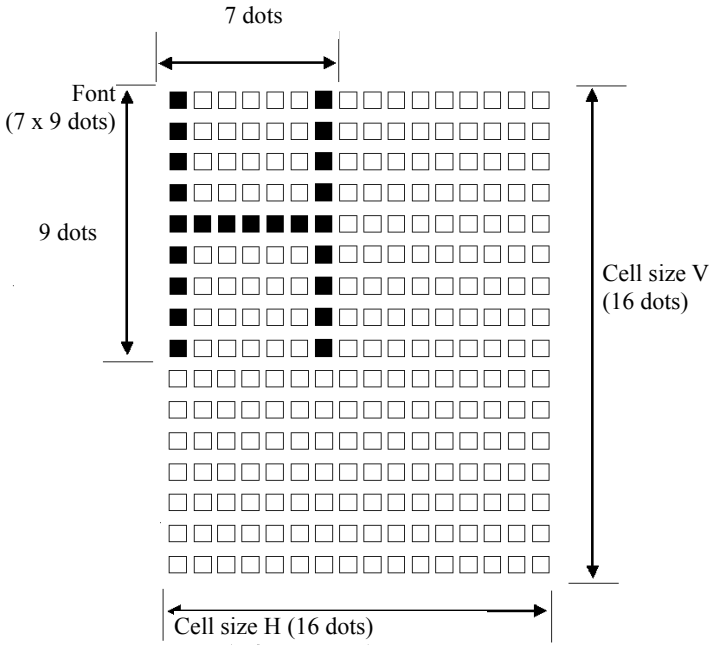


Fig. 7.4.4 Correlation between font and cell size

7.5. Setting the crosshatch pattern

(1) Set the mode and format.

Mode:Line	(0/1)
Format:from center	(0/1)

Fig. 7.5.1 Setting the mode and format

Table 7.5.1 Setting items

Setting item	Key operation	LCD display	General description
Mode	0	Line	For designating the number of lines (in which case the interval is the number of crosshatch lines).
	1	dot	For designating the number of dots (in which case the interval is the number of dots between the crosshatch patterns).
Format	0	from center	For drawing with the screen center serving as the start point.
	1	from LeftTop	For drawing with the top left of the screen serving as the start point.

(2) Set the H and V intervals and line width.

Interval	:H=	20	V=	20
Width	:H=	1	V=	1

Fig. 7.5.2 Setting the intervals and line width

Table 7.5.2 Setting items

Setting item	Key operation	Setting range
Interval	Number keys	0 to 9999 (Line/dot)*1
Width	Number keys	1 to 255 (dot)

*1 : The crosshatch in the H (or V) direction is not displayed if "0" is set for the H (or V) interval.

Shown below is the correlation between H and V.

<Correlation between H and V>

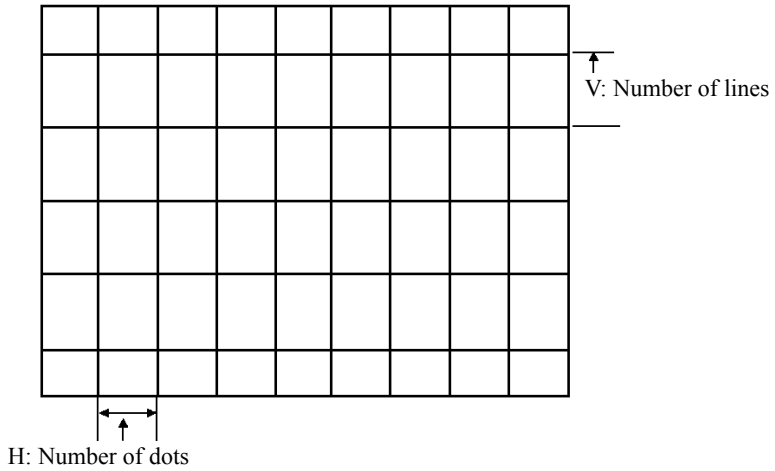


Fig. 7.5.3 H and V correlation 1

<When H and V are set to "0 and 1", "1 and 0" and "1 and 1">

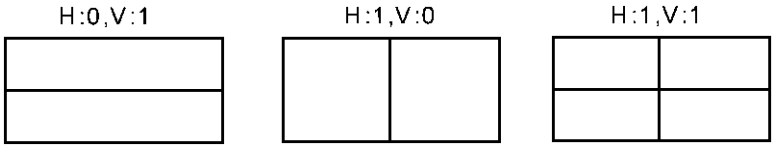


Fig. 7.5.4 H and V correlation 2

When "from center" is set as the format in step (1), the crosshatch pattern is displayed only after the screen center is calculated. When both the number of dots and number of lines to be displayed are set to odd numbers, the screen center can be calculated, but when they are set to even numbers, the point which is the first dot to the right of the center and the first line below it is used as the actual screen center.

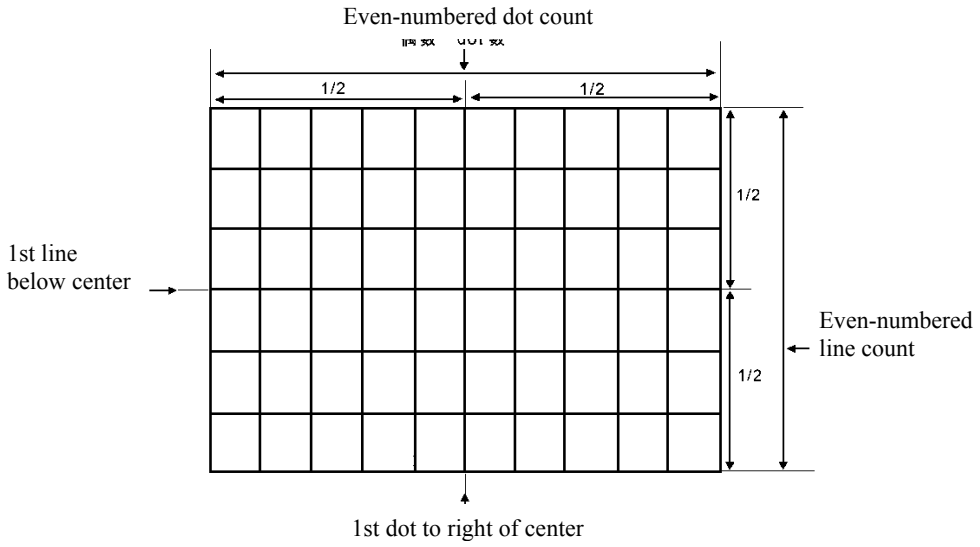


Fig. 7.5.5 Screen center

7.6. Setting the dot pattern

(1) Set the mode and format.

Mode:Line	(0/1)
Format:from center	(0/1)

Fig. 7.6.1 Setting the mode and format

Table 7.6.1 Setting items

Setting item	Key operation	LCD display	General description
Mode	0	Line	For designating the number of lines (in which case the interval is the number of dot pattern lines).
	1	dot	For designating the number of dots (in which case the interval is the number of dots between the dots).
Format	0	from center	For drawing with the screen center serving as the start point.
	1	from LeftTop	For drawing with the top left of the screen serving as the start point.

(2) Set the H and V intervals and the dot pattern size and type.

```
Interval:H=   20 V=   20
Size: 1dot Type:Rect (0/1)
```

Fig. 7.6.2 Setting the dot pattern size and type

Table 7.6.2 Setting items

Setting item	Key operation	LCD display	General description
Interval	Number keys		Setting range: 0 to 9999 (lines or dots)
Size	Number keys		Setting range: 1 to 15 (dots)
Type	0	Crcl	For drawing dots in the shape of a circle whose diameter is the designated size.
	1	Rect	For drawing dots in the shape of a square, one side of which is the designated size.

Shown below is the correlation between H and V.

<Correlation between H and V>

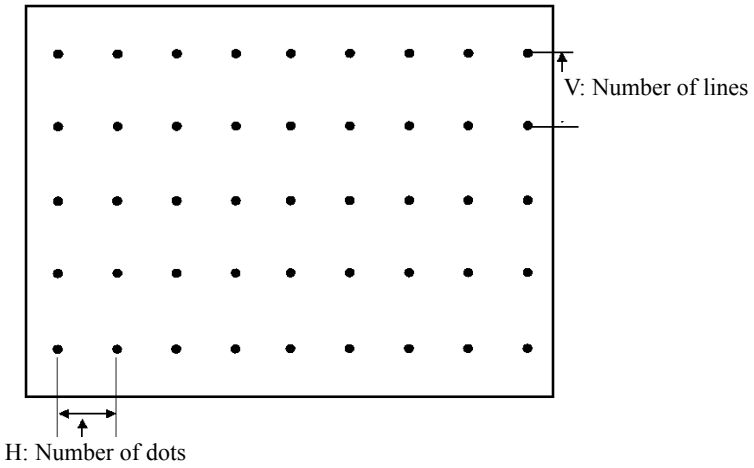


Fig. 7.6.3 H and V correlation 1

<When H and V are set to "1 and 1" and "0 and 0">

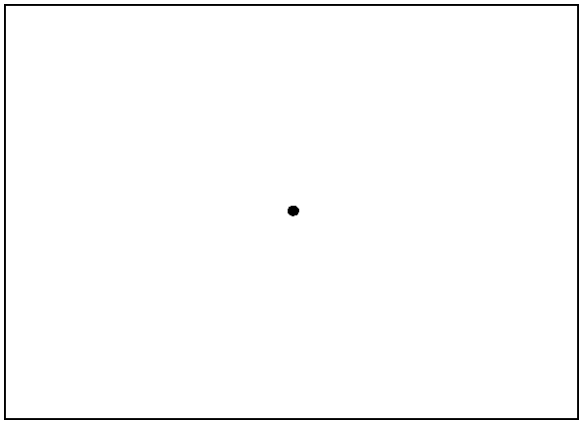


Fig. 7.6.4 H and V correlation 2

When "from center" is set as the format in step (1), the dot pattern is displayed only after the screen center is calculated. When both the number of dots and number of lines to be displayed are set to odd numbers, the screen center can be calculated, but when they are set to even numbers, the point which is the first dot to the right of the center and the first line below it is used as the actual screen center.

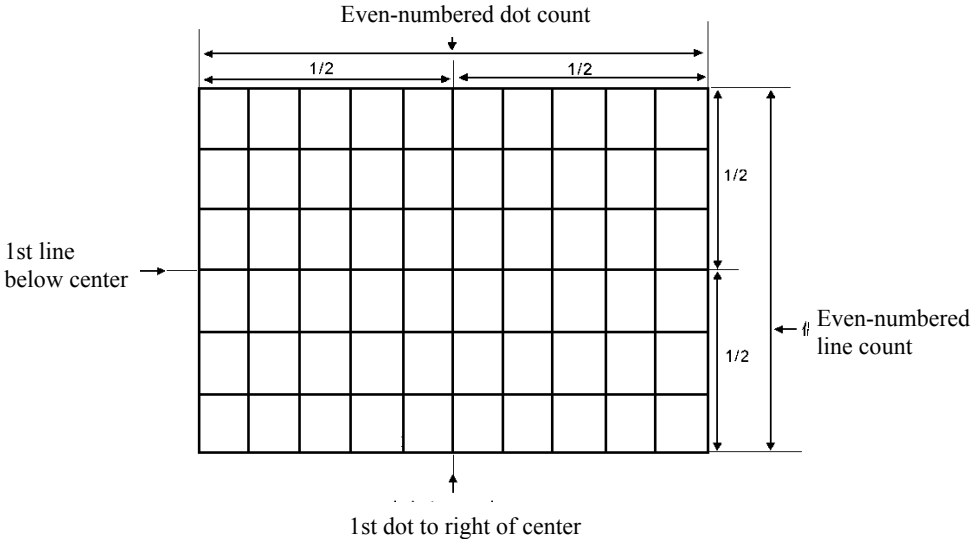


Fig. 7.6.5 Screen center

7.7. Setting the circle pattern

(1) Set the format and aspect ratio of the display.

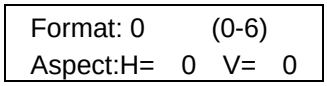


Fig. 7.7.1 Setting the format and aspect ratio

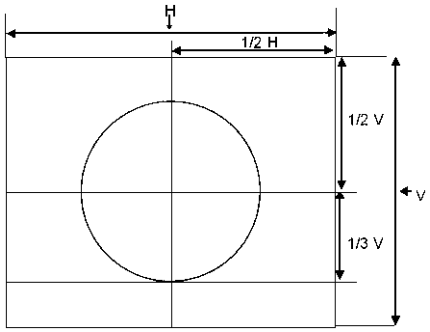
Table 7.7.1 Setting items

Setting item	Key operation	General description
Format	0	Format 0 • Single circle • Center: 1/2H, 1/2V • Radius: 1/3V
	1	Format 1 • Concentric circles (1) • Center: 1/2H, 1/2V • Radius (from center): 1/6V, 1/3V, 1/2V, 1/2H
	2	Format 2 • Format 1 + (4 circles with 1/6V radius)
	3	Format 3 • Concentric circles (2) • Center: 1/2H, 1/2V • Radius (from center): addition of other circles inside 1/6V, 1/3V, 1/2V circles whose radii are 1/2 of the original 3
	4	Format 4 • Consecutive circles with 1/6V radius • Circles are displayed symmetrically both horizontally and vertically with the center (1/2H, V/2V) serving as the reference.
	5	Format 5 • Single circle painted out • Center: 1/2H, 1/2V • Radius: 1/3V
	6	Format 6 • 5 circles with 1/6V radius painted out
Aspect	Number keys	Setting range: 0 to 255 *1

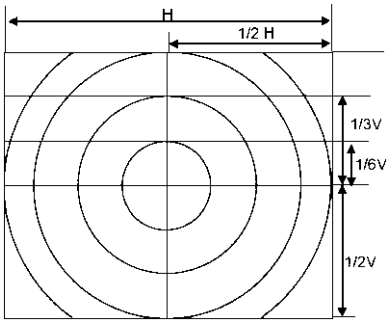
*1: Perfectly round circles are always displayed regardless of the display resolution by setting the aspect ratio of the monitor.
For example: H=4 and V=3 are set for an NTSC monitor (4:3), and H=16 and V=9 are set for an HDTV monitor (16:9). Perfectly round circles will not be drawn if "0" is set for H or V. (This is to ensure compatibility with Astro's existing VG generators.)

The formats are shown below.

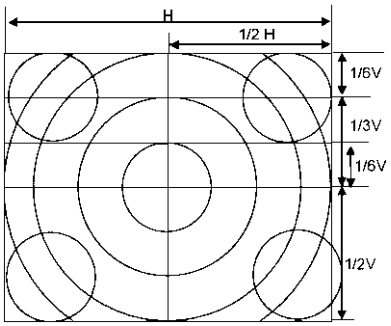
<Format 0>



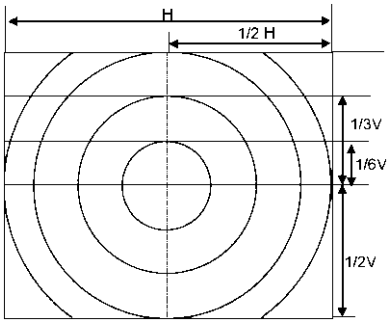
<Format 1>



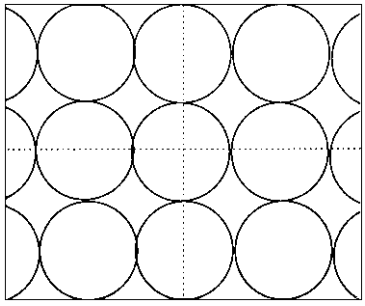
<Format 2>



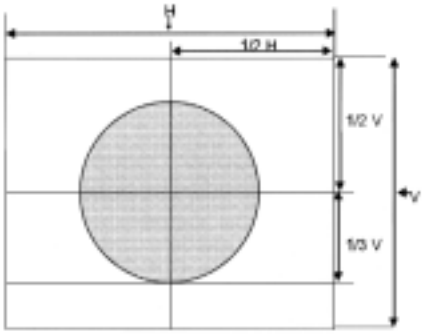
<Format 3>



<Format 4>



<Format 5>



<Format 6>

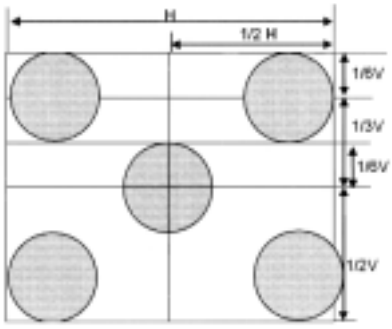


Fig. 7.7.2 Formats

7.8. Setting the color bar pattern

(1) Set the mode and direction.

Mode:%	(0/1)
Direction:Hor	(0-3)

Fig. 7.8.1 Setting the mode and direction

Table 7.8.1 Setting items

Setting item	Key operation	LCD display	
Mode	0	%	The interval is designated in step (2) as a percentage.
	1	dot	The interval is designated in step (2) as a number of dots.
Direction	0		The settings in steps (2) and (3) are repeated horizontally. Horizontal direction → C0 | 1 | 2 | ~ | F | C0 * The V interval is ignored.
	1		The settings in steps (2) and (3) are repeated vertically. C0 1 2 ≀ F C0 Vertical direction ↓ * The H interval is ignored.
	2		The settings in steps (2) and (3) are repeated horizontally, and when the corner is reached, they are continued onto the next line which is obtained through division by the V interval. Horizontal direction →

C0	1	2	~	F	C0
1	2	3	~	C0	1
2	3	4	~	1	2
3	4	5	~	2	3
4	5	6	~	3	4
5	6	7	~	4	5
C0	1	2	~	F	C0

	3		The settings in steps (2) and (3) are repeated vertically, and when the corner is reached, they are continued onto the next column which is obtained through division by the H interval. **C0** **1** **2** **3** **4** **5** **1** **2** **3** **4** **5** **6** **2** **3** **4** **5** **6** **7** ≀ ≀ ≀ ≀ ≀ ≀ **F** **C0** **1** **2** **3** **4** **C0** **1** **2** **3** **4** **5** ↓ Vertical direction

(2) Set the number of repetitions and the H and V intervals.

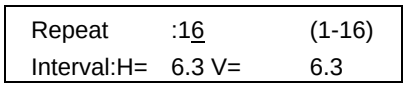


Fig. 7.8.2 Setting the interval

Table 7.8.2 Setting items

Setting item	Key operation	Setting range
Repeat	Number keys	1 to 16
Interval	Number keys	Dot setting range: H = 1 to 9999 dots, V = 1 to 9999 dots % setting range: H = 0.0 to 100.0(%), V = 0.0 to 100.0(%)

(3) Set the color layout of the color bars.

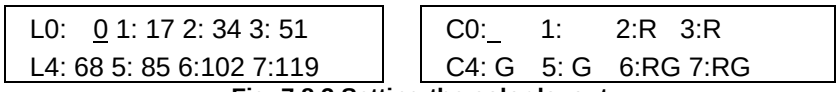


Fig. 7.8.3 Setting the color layout

Table 7.8.3 Setting items

Setting item	Key operation	LCD display	Color layout
C0 to CF	0	_	None
	1	R	Red
	2	G	Green
	3	RG	Red, green
	4	B	Blue
	5	RB	Red, blue
	6	GB	Green, blue
	7	RGB	Red, green, blue

7.9. Setting the gray scale pattern

(1) Set the mode and direction.

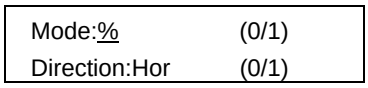


Fig. 7.9.1 Setting the mode and direction

Table 7.9.1 Setting items

Setting item	Key operation	LCD display	Color layout
Mode	0	%	The interval in step (2) is designated as a percentage.
	1	dot	The interval in step (2) is designated as a number of dots.
Direction	0	Hor	The settings in steps (2) and (3) are repeated horizontally.
	1	Ver	The settings in steps (2) and (3) are repeated vertically.

(2) Set the number of repetitions and the H and V intervals.

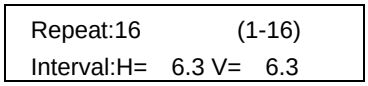


Fig. 7.9.2 Setting the number of repetitions and interval

Table 7.9.2 Setting items

Setting item	Key operation	Setting range
Repeat	Number keys	1 to 16
Interval	Number keys	• Dot setting range: H = 1 to 9999 dots, V = 1 to 9999 dots • % setting range: H = 0.0 to 100.0(%), V = 0.0 to 100.0(%)

(3) Set the level layout of the gray scale.

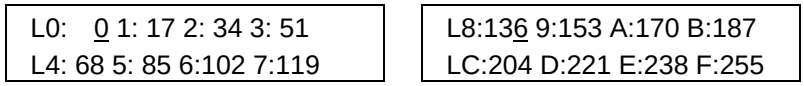


Fig. 7.9.3 Setting the level layout

Table 7.9.3 Setting item

Setting item	Key operation	Setting range
L0 to LF	Number keys	0 to 255

7.10. Setting the burst pattern

(1) Set the format, interval and step.

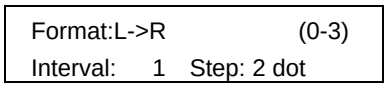


Fig. 7.10.1 Setting the format, interval and step

Table 7.10.1 Setting items

Setting item	Key operation	LCD display	General description
Format	0	L → R	The pattern is increased from left to right.
	1	L ← R	The pattern is increased from right to left.
	2	L ← C → R	The pattern is increased from the center to the left and right.
	3	L → C ← R	The pattern is increased from the left and right to the center.
Interval	Number keys		• The interval is the number of lines with same thickness which are to be displayed. • Setting range: 1 to 99 dots
Step	Number keys		• The step is the increment by which the line thickness is to be increased. The setting range is as shown below. • Setting range: 1 to 99 dots

An example where 0 is set for the format, 1 for the step and 5 for the interval is shown below.

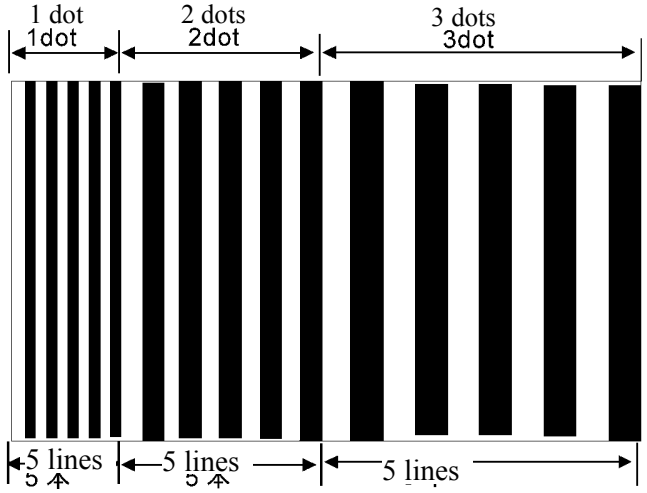


Fig. 7.10.2 Example of burst pattern setting

7.11. Setting the window pattern

Point

The window is displayed between the background (color bar, gray scale) and graphic pattern (character, etc.)

(1) Set the mode and format.

Mode:%	(0/1)
Format:1 WINDOW	(0-F)

Fig. 7.11.1 Setting the mode and format

Table 7.11.1 Setting items

Setting item	Key operation	LCD display	
Mode	0	%	For setting the widths (horizontal, vertical) as a percentage.
	1	dot	For setting the widths (horizontal, vertical) as a number of dots.
Format	0		Format 0: 1 window
	1		Format 1: 4 windows
	2		Format 2: 9 windows
	3		Format 3: 16 windows
	4		Format 4: 25 windows
	5		Format 5: 64 windows
	6		Format 6: 3 windows in a vertical row
	7		Format 7: 3 windows in a horizontal row
	8		Format 8: Scrolling to the sides
	9		Format 9: Scrolling up and down
	A		Format A: Scrolling to the right
	B		Format B: Scrolling to the left
	C		Format C: Scrolling up
	D		Format D: Scrolling down
	E		Format E: Window (position designated)
	F		Format F: The window RGB level can be varied automatically during direct display execution. The window display is the same as format 0.

he formats are shown below.

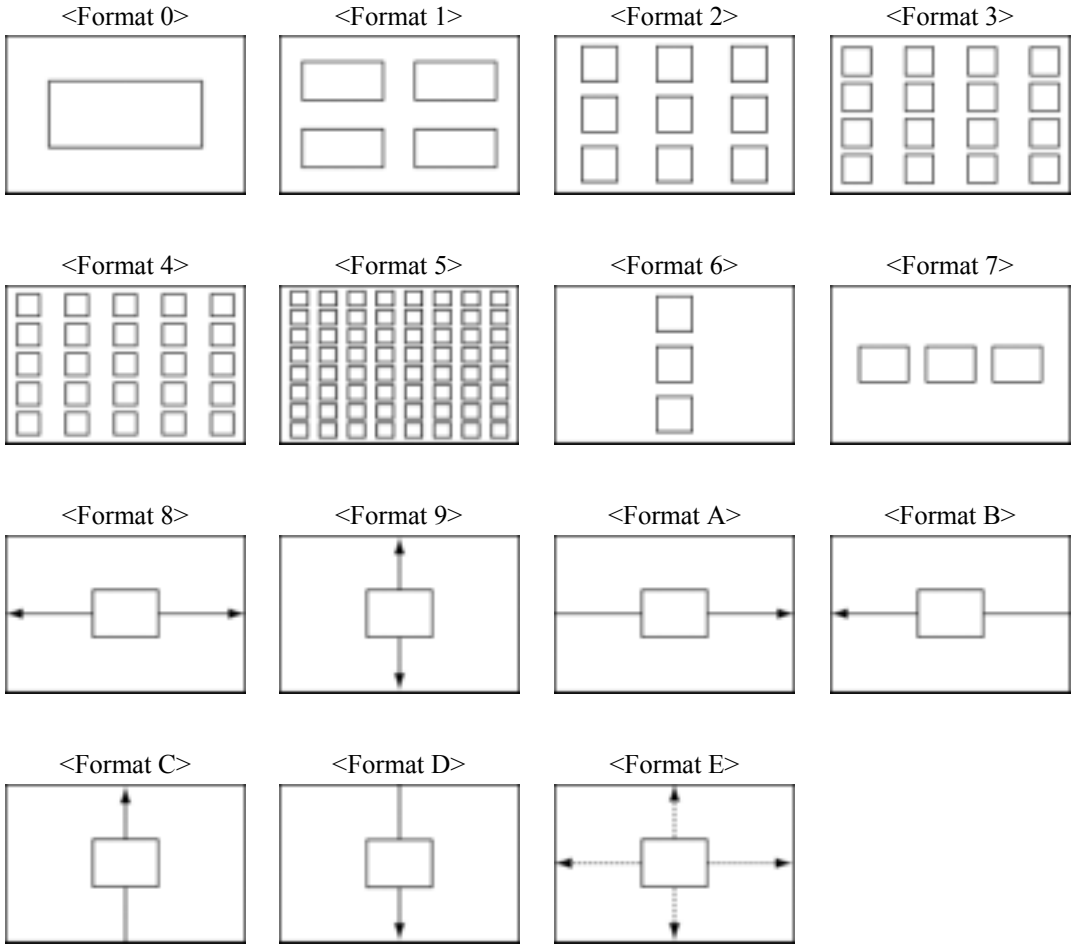


Fig. 7.11.2 Formats

(2) Set the horizontal and vertical widths and the window color (RGB).

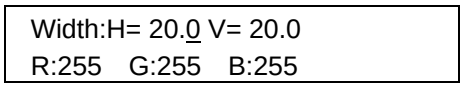


Fig. 7.11.3 Setting the horizontal and vertical widths and the window color

Table 7.11.2 Setting items

Setting item	Key operation	Setting range
Width	Number keys	• Dot setting range: H = 1 to 9999 dots, V = 1 to 9999 dots • % setting range: H = 0.1 to 100.0(%), V = 0.1 to 100.0 (%)
R, G, B	Number keys	0 to 255

Shown below is the correlation between H and V.

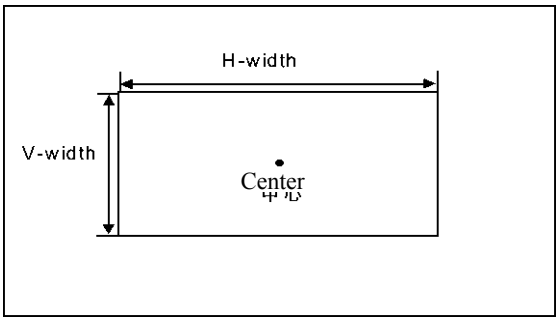


Fig. 7.11.5 Correlation between H and V

(3) Perform the settings related to the selected format.

- With window formats 0 to 7 or E: Set the flicker interval.
- With formats 8 to D: The window is scrolled. Set the scroll speed: the higher the value, the faster the speed.
- With format F: The window RGB level is automatically varied. Set the level variation speed: the higher the value, the slower the speed.

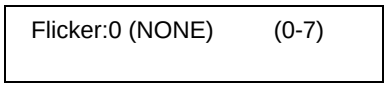


Fig. 7.11.6 Detailed settings of formats

Table 7.11.4 Flicker interval setting items

Setting item	Key operation	LCD display	Level layout
Flicker	0	0 (NO.NE)	No flicker
	1	1 (1V)	Flicker occurs every V period.
	2	2 (2V)	Flicker occurs every 2 V periods.
	3	3 (4V)	Flicker occurs every 4 V periods.
	4	4 (8V)	Flicker occurs every 8 V periods.
	5	5 (16V)	Flicker occurs every 16 V periods.
	6	6 (32V)	Flicker occurs every 32 V periods.
	7	7 (64V)	Flicker occurs every 64 V periods.

Table 7.11.5 Scroll speed settings

Setting item	Key operation	LCD display	Level layout
Flicker	0	1V:1dot	Window is scrolled by 1 dot every blanking period.
	1	1V:2dot	Window is scrolled by 2 dots every blanking period.
	2	1V:3dot	Window is scrolled by 3 dots every blanking period.
	3	1V:4dot	Window is scrolled by 4 dots every blanking period.
	4	1V:8dot	Window is scrolled by 8 dots every blanking period.
	5	1V:16dot	Window is scrolled by 16 dots every blanking period.
	6	1V:32dot	Window is scrolled by 32 dots every blanking period.
	7	1V:64dot	Window is scrolled by 64 dots every blanking period.

Table 7.11.6 Level variation speed settings

Setting item	Key operation		Level layout
Flicker	0	1V:1Level	Window is changed by 1 level every blanking period.
	1	2V:1Level	Window is changed by 1 level every 2 blanking periods.
	2	3V:1Level	Window is changed by 1 level every 3 blanking periods.
	3	4V:1Level	Window is changed by 1 level every 4 blanking periods.
	4	5V:1Level	Window is changed by 1 level every 5 blanking periods.
	5	6V:1Level	Window is changed by 1 level every 6 blanking periods.
	6	7V:1Level0	Window is changed by 1 level every 7 blanking periods.
	7	8V:1Level	Window is changed by 1 level every 8 blanking periods.

(4) In the case of format E, set the window center position.

```
Format-E   #1   ( 50.0,   50.0)
Pos        #2   (  0.0,    0.0)
```

Fig. 7.11.7 Setting the window center position

Table 7.11.7 Setting items

Setting item	Key operation	General description
Format-E Pos #1, #2	Number keys	• The window center position is set with (H,V). • Setting range: 0.0 to 100.0 (%) (*1)

*1 : The #2 window is not displayed when (0,0) is set for #2.

Point

To register the settings on the PC card, press the [SAVE] key to save them.

7.12. Setting the optional patterns

Caution

When optional patterns are set, they cannot be combined with any other patterns.

(1) Set the number of the optional pattern.

OPT1-NO.: 0 (00-BF)	OPT2-NO.: 0 (00-BF)

Fig. 7.12.1 Setting the optional pattern number

Table 7.12.1 Setting item

Setting item	Key operation	Setting range
OPT1-NO or OPT2-NO	Number keys	00 to BF*1

*1 : Optional patterns 00 to 3F are optional patterns incorporated inside the VG-848, patterns 40 to 7F are user-generated optional patterns, and patterns 80 to BF are image data (#1 to #64).

Image data and user-generated optional patterns are registered using the Windows software (SP-8848) provided as a standard option.

7.13. Setting the cursor pattern

(1) Set the format and position display mode.

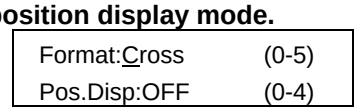


Fig. 7.13.1 Setting the format and position display mode

Table 7.13.1 Setting items

Setting item	Key opetation	LCD display	General description
Format	0	5*5	For setting a cross-shaped cursor consisting of 5 horizontal dots and 5 vertical dots.
	1	Cross	For setting a cross-shaped cursor which fills the entire screen.
	2	V-Line	For setting a vertical line as the cursor.
	3*1	5*5 (RGB)	For setting a cross-shaped cursor consisting of 5 horizontal dots and 5 vertical dots. (RGB)
	4*1	Cross (RGB)	For setting a cross-shaped cursor which fills the entire screen. (RGB)
	5*1	V-Line (RGB)	For setting a vertical line as the cursor. (RGB)

Setting item	Key opetation	LCD display	General description
Pos.Disp	0	OFF	The cursor position does not appear on the display.
	1	Normal1	The cursor position is displayed on the display in the following format. (H-pos, V-pos:STEPxx) • H-pos: Horizontal coordinate (1 or up) • V-pos: Vertical coordinate (1 or up) • STEP: Movement step (1, 10 or 100) * (1,1) serves as the coordinates for the top left of the display.
	2	Normal2	The cursor position is displayed on the display in the following format. (GATE=gate:STEPxx) (R=rrr, G=ggg, B=bbb) • gate: Vertical coordinate (1 or up) • rrr: R color horizontal coordinate (1 or up) • ggg: G color horizontal coordinate (2 or up) • bbb: B color horizontal coordinate (3 or up) • STEP: Movement step (1, 10 or 100) * (1,1) serves as the coordinates for the top left of the display. As the horizontal coordinates, the coordinates on the display are trebled and the +1, +2 and +3 values are displayed for R, G and B, respectively.
	3	Reverse1	The contents are the same as with "Normal1." Both the characters and coordinates are rotated by 180 degrees. If this display is inverted, the display will be the same as with "Normal1." (1,1) serves as the coordinates for the bottom right of the display.
	4	Reverse2	The contents are the same as with "Normal2." Both the characters and coordinates are rotated by 180 degrees. If this display is inverted, the display will be the same as with "Normal2." (1,1) serves as the coordinates for the bottom right of the display.

*1: The color changes from white → red → green → blue when the cursor moves.

(2) Set the flicker interval and movement step.

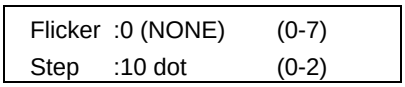


Fig. 7.13.2 Setting the flicker interval and movement step

Table 7.13.2 Setting items

Setting item	Key operation	LCD display	General description
Flicker	0	0 (NO.NE)	No flicker
	1	1 (1V)	Flicker occurs every V period.
	2	2 (2V)	Flicker occurs every 2 V periods.
	3	3 (4V)	Flicker occurs every 4 V periods.
	4	4 (8V)	Flicker occurs every 8 V periods.
	5	5 (16V)	Flicker occurs every 16 V periods.
	6	6 (32V)	Flicker occurs every 32 V periods.
	7	7 (64V)	Flicker occurs every 64 V periods.

Setting item	Key operation	LCD display	General description
Step	0	1dot	Movement is made in 1-dot increments.
	1	10dot	Movement is made in 10-dot increments.
	2	100dot	Movement is made in 100-dot increments.

(3) Set the cursor color (RGB) and background color (BRBGBB).

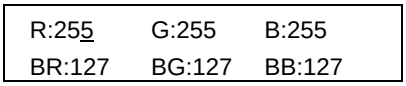


Fig. 7.13.3 Setting the cursor color and background color

Table 7.13.3 Setting items

Setting item	Key operation	Setting range
R, G, B, BR, BG, BB	Number keys	0 to 255

7.14. Setting the program name

(1) Set the display position, font and program name.

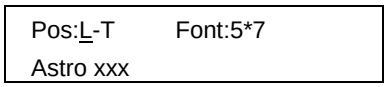


Fig. 7.14.1 Setting the display position, font and program name

Table 7.14.1 Setting items

Setting item	Key operation	LCD display	General description
Pos	0	Cntr	The program name is displayed in the center of the screen.
	1	L-T	The program name is displayed at the top left of the screen.
	2	L-B	The program name is displayed at the bottom left of the screen.
	3	R-T	The program name is displayed at the top right of the screen.
	4	RB	The program name is displayed at the bottom right of the screen.
Font	0	5*7	5x7 font
	1	7*9	7x9 font
	2	16*16	16x16 font

(2) Input the program name (using up to 20 characters). (Refer to "How to input character codes from the display" in 5.10.)

7.15. Setting pattern action

7.15.1. Setting method

(1) Set the pattern execution interval (in V increments).

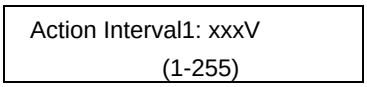


Fig. 7.15.1 Setting the execution interval

Table 7.15.1 Setting items

Setting ite	Key operation	Setting range
Action Interval1	Number keys	0 to 255
Action Interval2 Action Interval3 Action Interval4	Number keys	0 to 255

Point

A number of different types of scrolling such as 2-3 pulldown can be simulated by setting Action Interval 2, 3 or 4.
For normal scrolling, set "0" for Action Interval 2 and 3.

Pull-down scrolling

Using the scroll function, 2-3 pull-down and other types of scrolling can be achieved artificially.

<What is 2-3 pull-down>

This is a conversion system for harmonizing 30 fps (frames per second) 60-field NTSC signals with 24 fps films when converting regular movies and other film sources into video signals (a process referred to as "telecine"). The first frame of the film is converted into the equivalent of two fields and the second frame into the equivalent of three fields, and these five fields are repeated for every two frames of the film so that 24 frames are made the equivalent of 60 fields.

(2) Set the type of graphic plane scrolling and scrolling direction.

G-SCR:OFF	(0/1)
G-Dir:L-D	(0-9)

Fig. 7.15.2 Setting the scrolling and scrolling direction

Table 7.15.2 Setting items

Setting item	Key operation	LCD display	General description
G-SCR	0	OFF	Graphic plane scrolling is not executed. (Factory setting)
	1	ON	Graphic plane scrolling is executed.
G-Dir	0	Mov	The display start coordinates are moved, and simple moving picture is executed. (*1)
	1	L-D	The plane is scrolled toward the bottom left.
	2	D	The plane is scrolled downward.
	3	R-D	The plane is scrolled toward the bottom right.
	4	L	The plane is scrolled toward the left.
	6	R	The plane is scrolled toward the right.
	7	L-U	The plane is scrolled toward the top left.
	8	U	The plane is scrolled upward.
	9	R-U	The plane is scrolled toward the top right.

*1 : For details on the simple moving picture, refer to "Concerning the simple moving picture function" in 7.15.2.

(3) Set the type of character plane scrolling and scrolling direction.

C-SCR:OFF	(0/1)
C-Dir:L-D	(1-9)

Fig. 7.15.3 Setting the scrolling and scrolling direction

Table 7.15.3 Setting items

Setting item	Key operation	LCD display	General description
C-SCR	0	OFF	Character plane scrolling is not executed. (Factory setting)
	1	ON	Character plane scrolling is executed.
C-Dir	1	L-D	The plane is scrolled toward the bottom left.
	2	D	The plane is scrolled downward.
	3	R-D	The plane is scrolled toward the bottom right.
	4	L	The plane is scrolled toward the left.
	6	R	The plane is scrolled toward the right.
	7	L-U	The plane is scrolled toward the top left.
	8	U	The plane is scrolled upward.
	9	R-U	The plane is scrolled toward the top right.

(4) Set the scroll step.

The same step is used for 8-bit and 1-bit plane scrolling.

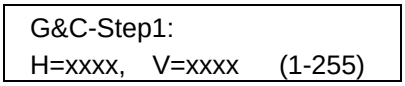


Fig. 7.15.4 Setting the scroll step

Table 7.15.4 Setting items

Setting item	Key operation	Setting range
G&C-Step1	Number keys	• H (step in horizontal direction): 1 to 255 (dots) • V (step in vertical direction): 1 to 255 (H) * When the simple moving picture function is selected, the setting value becomes as below: • H(H direction frame size) : 1 to 4095 (dot) • V(V direction frame size) : 1 to 4095 (H)
G&C-Step2 G&C-Step3 G&C-Step4	Number keys	• H (step in horizontal direction): 0 to 255 (dots) • V (step in vertical direction): 0 to 255 (H)

Point

When Action Interval 2 or 3 has been set, perform the settings for G&C-Step 2, 3 and 4. For normal scrolling, set "0" for G&C-Step 2, 3 and 4.

(5) Set the number of simple moving picture repetitions.

Fig. 7.15.4 Setting the number of repetitions

Table 7.15.4 Setting items

Setting item	Key operation	Setting range
G-Repeat	Number keys	• H (number of repetitions in horizontal direction): 1 to 15 • V (number of repetitions in vertical direction) 1 to 15

Point

This setting is valid only when "Mov" has been set as the 8-bit scrolling direction (G-Dir).

(6) Set the window scrolling, flicker and palette scrolling.

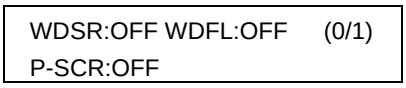


Fig. 7.15.5 Setting the window and palette

Table 7.15.5 Setting items

Setting item	Key operation	LCD display	General description
W-SCR	0	OFF	Window scrolling is not executed. (Factory setting)
	1	ON	Window scrolling is executed.
W-FLK	0	OFF	Window flicker is not executed.
	1	ON	Window flicker is executed.
P-SCR	0	OFF	Palette scrolling is not executed. (Factory setting)
	1	ON	Palette scrolling is executed.

(7) Set the window scrolling direction and step.

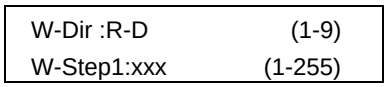


Fig. 7.15.6.1 Setting the scrolling direction and step (1)

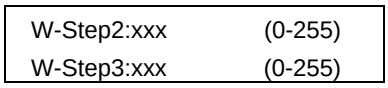


Fig. 7.15.6.2 Setting the step (2)

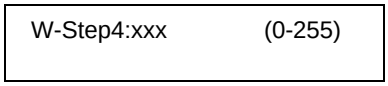


Fig. 7.15.6.3 Setting the step (3)

Table 7.15.6 Setting items

Setting item	Key operation	LCD display	General description
W-Dir	1	L-D	The window is scrolled toward the bottom left.
	2	D	The window is scrolled downward.
	3	R-D	The window is scrolled toward the bottom right.
	4	L	The window is scrolled toward the left.
	6	R	The window is scrolled toward the right.
	7	L-U	The window is scrolled toward the top left.
	8	U	The window is scrolled upward.
	9	R-U	The window is scrolled toward the top right.
W-Step1	Number keys		Same step in horizontal and vertical directions: 1 to 255
W-Step2 W-Step3 W-Step4	Number keys		Same step in horizontal and vertical directions: 0 to 255

Point

When Action Interval 2 or 3 has been set, perform the settings for W-Step 2, 3 and 4. For normal scrolling, set "0" for W-Step 2 and 3.

(8) Set the palette scroll step, start position and end position.

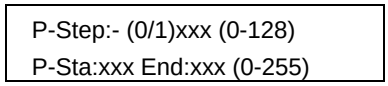


Fig. 7.15.7 Setting the palette scrolling

Table 7.15.7 Setting items

Setting item	Key operation	LCD display	General description
P-Step (sign)	0	-	Used for setting a negative value.
	1	+	Used for setting a positive value.
P-Step (number of steps)	Number keys		1 to 128
P-Sta	Number keys		0 to 255
End	Number keys		0 to 255

7.15.2. Concerning the simple moving picture function

This function enables simple moving pictures to be displayed by drawing a multiple number of pictures in the drawing area and moving the display start coordinates.
Provided as an example is a description of the display method used for 9-frame simple moving pictures consisting of three 640x480 images stacked vertically and three 1920x1440 (*1) images placed side by side horizontally.
*1: The 1920x1440 images must be processed and edited by the user.

Caution

The bitmap picture size that can be used in simple moving picture function is H x V x 3→ up to 8M.
e.g.) When using 1920 x 1440 picture, the size becomes 1920 x 1440 x 3 = 8294400 bytes.
Note) The 8M size is 1024 x 1024 x 8 = 8388608 bytes.

(1) Set 8-bit plane scrolling (G-SCR) to "ON" and the scrolling direction (G-Dir) to "Mov."

(2) Set "H=640" and "V=480" for the 8-bit scroll step (G-Step).

Caution

Set H and V to correspond with the number of dots for H disp and number of lines for V disp in the timing data. (Refer to "Configuration of timing data" in 6.1.1.) If they do not correspond, the image may be displayed out of position.

(3) Set "H=3" and "V=3" for the number of simple moving picture repetitions (G-Repeat).
The display start coordinates now move in the sequence of #1 through #9 shown in the figure below.
* The figures in parentheses denote the display start coordinates.

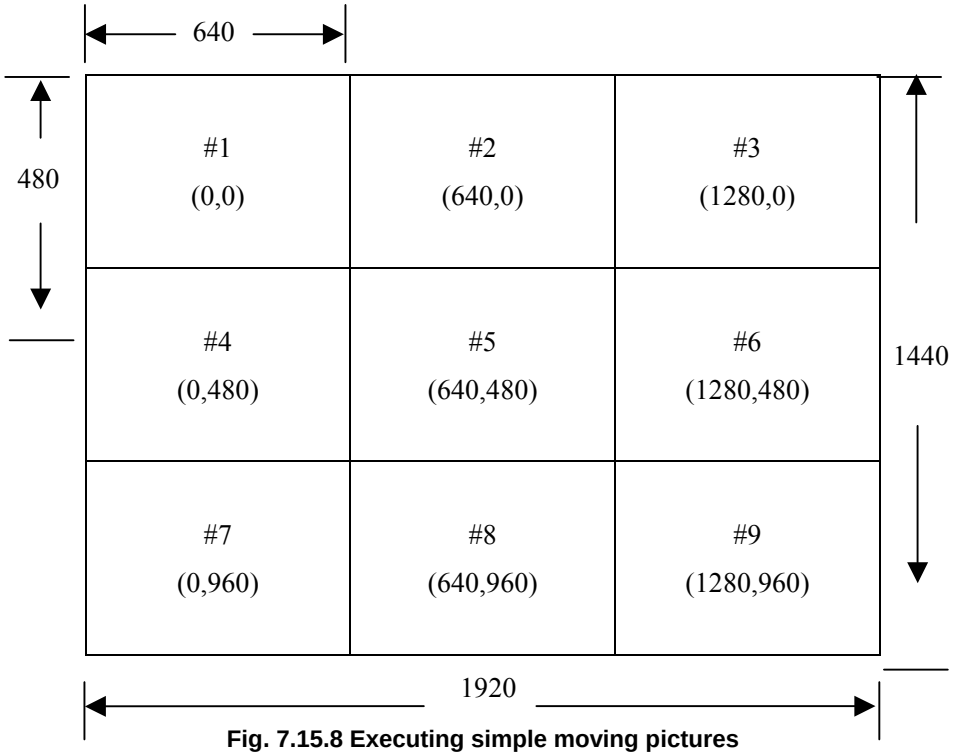


Fig. 7.15.8 Executing simple moving pictures

8 Remote control operations

8.1. Operations performed from the RB-614C

By connecting the RB-614C, the VG-848 can be operated by remote control. The following three functions can be executed using the RB-614C. The RB-614C cannot be used to edit program data, etc.

- Direct display
- PC card data copying
- List display function

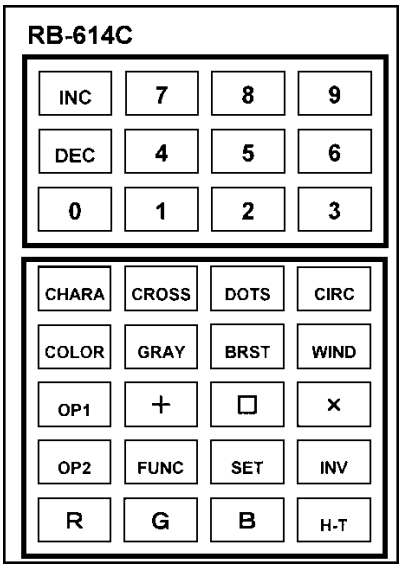


Fig. 8.1.1 RB-614C

8.1.1. Connecting the RB-614C

Connect the connecting cable of the RB-614C to the remote connector on the rear panel of the VG-848.

8.1.2. Concerning the key operations

The keys of the RB-614C listed in the table below can be used in place of the corresponding VG-848/RB-1848 keys.

Table 8-1-1 Correspondence of keys

RB-614C	RB-649	RB-1848
[INC] key	[INC] key	[INC] key
[DEC] key	[DEC] key	[DEC] key
-	[0] to [9] number keys	[0] to [9] number keys
-	[CHARA] to [OPT2] keys	[CHARA] to [OPT2] keys
-	[FUNC] key	[FUNC] key
[SET] key	[SET] key	[SET] key
-	[INV] key	[INV] key
-	[R] to [B] keys	[R] to [B] keys
-	[H-T] key	-

8.2. Operations performed from the RB-649

By connecting the RB-649, the VG-848 can be operated by remote control. The following three functions can be executed using the RB-649. The RB-649 cannot be used to edit program data, etc.

- Direct display
- PC card data copying
- List display function

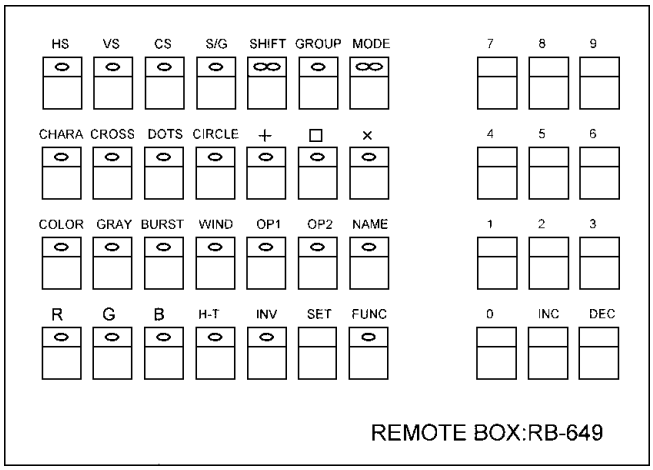


Fig. 8.2.1 RB-649

8.2.1. Connecting the RB-649

Connect the connecting cable of the RB-649 to the remote connector on the rear panel of the VG-848.

8.2.2. Concerning the key operations

The keys of the RB-649 listed in the table below can be used in place of the corresponding keys on the VG-848 or RB-1848.

Table 8-2-1 Correspondence of keys

RB-614C	RB-649	RB-1848
-	[HS] to [G/S] keys	[HS] to [G/S] keys
-	[SHIFT] key	[SHIFT] key
-	[GROUP]key	Corresponds to the [ESC] key which is used to change the group numbers in the group display mode. (Refer to "■ Changing the number of the group to be output.")
-	[MODE] key This functions as follows in the direct display mode: • When it lights up (red line): All the program data is executed. • When it lights up (red): Only the timing data is executed. • When it lights up (green): Only the pattern data is executed.	-
-	[CHARA] to [NAME] keys	[CHARA] to [NAME] keys
-	[R] to [B] keys	[R] to [B] keys
-	[H-T] key	-
-	[INV] key	[INV] key
[SET] key	[SET] key	[SET] key
-	[FUNC] key	[FUNC] key
-	[0] to [9] number keys	[0] to [9] number keys
[INC] key	[INC] key	[INC] key
[DEC] key	[DEC] key	[DEC] key

9 Outline of self-check function and execution procedure

9.1. Concerning the self-check function

The self-check function makes it possible to check whether the hardware devices in the VG-848 are working properly.

Caution

To exit the self-check, turn off the power.

9.1.1. Self-check function startup method

(1) Turn on the power of the VG-849 while holding down the increment key.

The buzzer sounds, and the self-check mode starts up.
The firmware version can be checked at this time.

```
VG-849 Self Check Mode
ROM Version : 1.06
```

Fig. 9.1.1 Self-check mode startup

In five seconds, the buzzer sounds again, and the FPGA version and board type are displayed.

```
BOARD REV:   00060E0Ah
BOARD TYPE: 00000000h
```

Fig. 9.1.2 Checking the FPGA version

Point

All the LEDs light up when the front keys or RB-1848 is connected.

In another five seconds, the check item selection screen is displayed on the LCD.

```
Select Item.: 0  (0-4)
Key Check
```

Fig. 9.1.3 Check item selection screen

9.1.2. Types of check items available

The self-check items are listed below.

Table 9.1.1 Check items

Check item	General description	Ref. page no.
Key check	For checking the keys and LEDs on the front panel of the VG-848.	p.136
PC card check	For checking the PC card.	p.137
RS232C check	For checking the RS-232C loopback.	p.138
Flash ROM check	For checking the internal flash ROM.	p.139
Flash ROM initialize	For initializing the internal flash ROM.	p.140

Point

If the [ESC] key is pressed instead while the checks are being executed, the checks are aborted, and the check item selection screen is restored.

9.2. Key check

(1) Press the [0] key and [SET] key.

```
Select Item.: 0   (0-4)
Key Check
```

Fig. 9.2.1 Selecting the key check

(2) Press the key to be checked. The key which has been pressed is displayed on the LCD display.

```
Key Check   (ESC=end)
Push Any Key
```

Fig. 9.2.2 Selecting the key

Point

If the [ESC] key is pressed instead, the check is aborted, and the check item selection screen is restored.

9.3. PC card check

Caution

A PC card is required for this check. Install the card properly before proceeding with the check.

(1) Press the [1] key and [SET] key.

```
Select Item: 1 (0-4)
Mem-Card Check
```

Fig. 9.3.1 Selecting the PC card check

(2) Press the [SET] key.

```
Mem-Card Check
                    OK?
```

Fig. 9.3.2 Confirming the check

(3) Press the [SET] key.

```
Mem-Card Check
Really OK ?  or press ESC
```

Fig. 9.3.3 Executing the check

The PC card check is executed.

1) While the check is being executed, the following screen appears on the LCD display.

```
MemoryCard Checking …
```

Fig. 9.3.4 Executing the check

2) Upon completion of the check, the following screen appears on the LCD display. Three seconds later, the check item selection screen is restored.

```
MemCard Check OK
     ESC → end
```

Fig. 9.3.5 Completing the check

Point

If an error is found, the error buzzer sounds.
The following screen appears on the LCD display.

```
MemoryCard Checking …
E29:M-Card UnForamted
```

9.4. RS-232C check

Caution

A connector is required for this check. Install the connector properly before proceeding with the check.

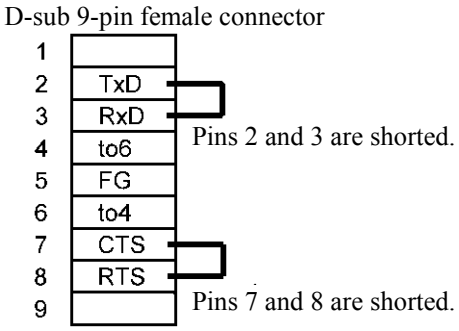


Fig. 9.4.1 Connector

(1) Press the [2] key and [SET] key.

```
Diag:Select NO.: 2   (0-4)
RS-232C   (LoopBack)
```

Fig. 9.4.2 Selecting the RS-232C check

The RS-232C check is executed.

```
RS-232C Check
OK   : R=rr W=ww
       Read data  Write data
```

Fig. 9.4.3 Executing the check

(2) Upon completion of the check, the following screen appears on the LCD display. Three seconds later, the check item selection screen is restored.

```
RS-232C Check OK
      ESC → end
```

Fig. 9.4.4 Completing the check

Point

If an error is found, the error buzzer sounds, and the check is aborted. (Codes 20H to 7FH are checked.) The following screen appears on the LCD display.

```
RS-232C Check
ERR : R=rr W=ww
```

9.5. Internal flash ROM check

(1) Press the [3] key and [SET] key.

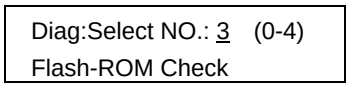


Fig. 9.5.1 Selecting the internal flash ROM check

(2) Press the [SET] key.

The internal flash ROM check is executed.

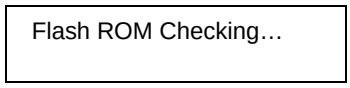


Fig. 9.5.2 Executing the check

(3) Upon completion of the check, the following screen appears on the LCD display. Three seconds later, the check item selection screen is restored.

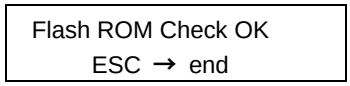
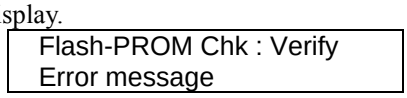


Fig. 9.5.3 Completing the check

Point

If an error is found, the error buzzer sounds, and the check is aborted. The following screen appears on the LCD display.



9.6. Internal flash ROM initialize

Caution

When this operation is conducted, the data contents stored on the internal flash ROM are initialized to their factory settings.

(1) Press the [4] key and [SET] key.

```
Select Item      : 4   (0-4)
Flash-ROM Init.
```

Fig. 9.6.1 Selecting the internal flash ROM initialize

(2) Press the [SET] key.

```
Flash-ROM Init.
Restore cofing data,OK?
```

Fig. 9.6.2 Initializing the internal flash ROM

The internal flash ROM is initialized.

(3) Upon completion of initializing, the following screen appears on the LCD display. Three seconds later, the check item selection screen is restored.

```
Flash-ROM Init. OK
      ESC → end
```

Fig. 9.6.3 Completing the initializing

10 Appendices

10.1. Internal data

10.1.1. Program data（PG1 Table）

Program No.	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (HxV)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
850	37.86	85.08	31.500	640x400	Prog	N	P	ANALOG	RGB	VESA400-85	Character list 7x9	Character List
851	37.86	72.81	31.500	640x480	Prog	N	N	ANALOG	RGB	VESA480-72	OPT27 (song of youth)	Words
852	37.50	75.00	31.500	640x480	Prog	N	N	ANALOG	RGB	VESA480-75	Character 1 (H 5x7/10x14)	H Character 1
853	35.16	56.25	36.000	800x600	Prog	P	P	ANALOG	RGB	VESA600-56	Character 1 (H 7x9/14x18)	H Character 2
854	37.88	60.32	40.000	800x600	Prog	P	P	ANALOG	RGB	VESA600-60	Character 1 (H 16x16/32x32)	H Character 3
855	48.08	72.19	50.000	800x600	Prog	P	P	ANALOG	RGB	VESA600-72	Character 2 (H 5x7/10x14)	H Character 4
856	48.36	60.00	65.000	1024x768	Prog	N	N	ANALOG	RGB	VESA768-60	Character 2 (H 7x9/14x18)	H Character 5
857	56.48	70.07	75.000	1024x768	Prog	N	N	ANALOG	RGB	VESA768-70	Character 2 (H 16x16/32x32)	H Character 6
858	60.02	75.03	78.750	1024x768	Prog	P	P	ANALOG	RGB	VESA768-75	Character 1 (@ 7x9/14x18)	@ Character
859	79.98	75.02	135.000	1280x1024	Prog	P	P	ANALOG	RGB	VESA1024-75	Character 1 (Chinese character "KU" 7x9/14x18)	Chinese Chara 1
860	91.15	85.02	157.500	1280x1024	Prog	P	P	ANALOG	RGB	VESA1024-85	Character 1 (Chinese character "BI" 7x9/64x64)	Chinese Chara 2
861	75.00	60.00	162.000	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-60	Character 1 (Chinese character "AI" 7x9/64x64)	Chinese Chara 3
862	81.25	65.00	175.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-65	Character 1 (Chinese character "ICHI" 16x16/16x16)	1 dot ONO.FF
863	87.50	70.00	189.000	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-70	Character me (#1 18x18)	me Character 1
864	93.75	75.00	202.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-75	Character me (VESA specifications 18x18)	me Character 2
865	100.00	80.00	216.000	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-80	OPT0B (character edge H)	H Character Line

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
866	106.25	85.00	229.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1200-85	OPT0C (character edge O)	O Character Line
867	98.21	70.05	236.500	1800x1350	Prog	N	P	ANALOG	RGB	VESA1350-70		
868	18.44	49.83	16.260	750x350	Prog	N	N	ANALOG	RGB	MDA	1-dot width crosshatch (H=5, V=5)	1 line Cross5x5
869	15.75	60.10	14.360	640x200	Prog	N	N	ANALOG	RGB	CGA	2-dot width crosshatch (H=5, V=5)	2 line Cross 5x5
870	21.85	59.71	16.260	640x350	Prog	N	N	ANALOG	RGB	EGA	OPT23 (EDOD)	
871	30.48	60.00	24.870	640x400	Prog	N	N	ANALOG	RGB	PGA	2-dot width crosshatch (H=8, V=8)	2 line Cross 8x8
872	31.47	50.03	28.320	720x350	Prog	N	N	ANALOG	RGB	VGA-TEXT350-50	1-dot width crosshatch (H=10, V=8)	1 line Cross 10x8
873	31.47	59.94	28.320	720x350	Prog	N	N	ANALOG	RGB	VGA-TEXT350-60	2-dot width crosshatch (H=10, V=8)	2 line Cross 10x8
874	31.47	70.08	28.320	720x350	Prog	N	N	ANALOG	RGB	VGA-TEXT350-70	1-dot width crosshatch (H=16, V=12)	1 line Cross 16x12
875	31.47	50.03	28.320	720x400	Prog	N	N	ANALOG	RGB	VGA-TEXT400-50	2-dot width crosshatch (H=16, V=12)	2 line Cross 16x12
876	31.47	59.94	28.320	720x400	Prog	N	N	ANALOG	RGB	VGA-TEXT400-60		
877	31.47	70.08	28.320	720x400	Prog	N	N	ANALOG	RGB	VGA-TEXT400-70	Burst (format 0)	Burst 1
878	31.47	50.03	25.175	640x350	Prog	N	N	ANALOG	RGB	VGA350-50	Burst (format 1)	Burst 2
879	31.47	59.94	25.175	640x350	Prog	N	N	ANALOG	RGB	VGA350-60	Burst (format 2)	Burst 3
880	31.47	70.09	25.175	640x350	Prog	N	N	ANALOG	RGB	VGA350-70	Burst (format 3)	Burst 4
881	31.47	50.03	25.175	640x400	Prog	N	N	ANALOG	RGB	VGA400-50		
882	31.47	59.94	25.175	640x400	Prog	N	N	ANALOG	RGB	VGA400-60	OPT10 (sine wave scroll)	Sign Wave Scroll
883	31.47	70.09	25.175	640x400	Prog	N	N	ANALOG	RGB	VGA400-70	OPT11 (multi burst)	Multi Burst
884	31.47	50.03	25.175	640x480	Prog	N	N	ANALOG	RGB	VGA480-50	OPT12 (10 steps & 1/10 MHz)	1/10MHz x 10step
885	31.47	59.94	25.175	640x480	Prog	N	N	ANALOG	RGB	VGA480-60	Circle (format 0)	Circle 1
886	35.16	57.16	36.000	800x600	Prog	N	N	ANALOG	RGB	S-VGA-56	Circle (Format 1)	Circle 2
887	48.08	72.19	50.000	800x600	Prog	N	N	ANALOG	RGB	S-VGA-72	Circle (Format 2)	Circle 3
888	46.88	75.00	49.500	800x600	Prog	N	N	ANALOG	RGB	S-VGA-75	Circle (Format 3)	Circle 4
889	48.08	59.80	65.000	1024x768	Prog	N	N	ANALOG	RGB	XGA-60	Circle (Format 4)	Circle 5
890	53.95	66.11	71.640	1024x768	Prog	N	N	ANALOG	RGB	XGA-66	Circle (Format 5)	Circle 6
891	56.48	70.07	75.000	1024x768	Prog	N	N	ANALOG	RGB	XGA-70	Circle (format 6)	Circle 7
892	60.68	57.03	100.000	1280x1024	Prog	N	N	ANALOG	RGB	SXGA-57		
893	63.50	59.68	106.930	1280x1024	Prog	N	N	ANALOG	RGB	SXGA-60A	Window (Format 0, Flicker 0)	Window 1
894	63.75	59.75	110.160	1280x1024	Prog	N	N	ANALOG	RGB	SXGA-60B	Window (Format 1, Flicker 0)	Window 2

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
895	63.72	60.00	109.470	1280x1024	Prog	N	N	ANALOG	RGB	SXGA-60C	Window (Format 2, Flicker 0)	Window 3
896	78.91	74.16	132.880	1280x1024	Prog	N	N	ANALOG	RGB	SXGA-70	Window (Format 3, Flicker 0)	Window 4
897	74.63	59.94	160.000	1600x1200	Prog	N	N	ANALOG	RGB	UXGA1200-60	Window (Format 4, Flicker 0)	Window 5
898	107.42	85.05	220.000	1600x1200	Prog	N	N	ANALOG	RGB	UXGA1200-85A	Window (Format 5, Flicker 0)	Window 6
899	106.48	85.05	230.000	1600x1200	Prog	N	N	ANALOG	RGB	UXGA1200-85B	Window (Format 8, Flicker 7)	Moving Window 1
900	107.42	80.05	220.000	1600x12 80	Prog	N	N	ANALOG	RGB	UXGA1280-80A	Window (Format 9, Flicker 7)	Moving Window 2
901	106.48	80.06	230.000	1600x1280	Prog	N	N	ANALOG	RGB	UXGA1280-80B	Window (Format E, Flicker 7)	Moving Window 3
902	106.40	80.00	238.340	1600x1280	Prog	N	N	ANALOG	RGB	UXGA1280-80C	Window (Format F, Flicker 0)	Window Level
903	109.82	80.40	246.000	1600x1280	Prog	N	N	ANALOG	RGB	UXGA1280-82	Window (Format 0, Flicker 1)	FlickerWindow 1
904	35.52	87.06	44.900	1024x768	Int	N	N	ANALOG	RGB	IBM 8514A	Window (Format 0, Flicker 3)	FlickerWindow 2
905	63.36	60.00	89.120	1024x1024	Prog	N	N	ANALOG	RGB	IBM 5080	Window (Format 0, Flicker 5)	FlickerWindow 3
906	29.58	73.22	24.020	640x754	Int	N	N	ANALOG	RGB	IBM 5550	Window (Format 0, Flicker 7)	FlickerWindow 4
907	63.36	60.00	111.520	1280x1024	Prog	N	N	ANALOG	RGB	IBM 6000		
908	15.71	59.98	6.380	323x246	Prog	N	N	ANALOG	RGB	NAVIGATION	Color bar (horizontal, 8 colors x 1)	Color Bar 1
909	35.00	66.67	30.240	640x480	Prog	N	N	ANALOG	RGB	Mac 480-66A	Color bar (horizontal, 8 colors x 2)	Color Bar 2
910	34.97	66.60	31.330	640x480	Prog	N	N	ANALOG	RGB	Mac 480-66B	Color bar (vertical, 8 colors x 1)	Color Bar 3
911	48.83	66.89	50.000	800x600	Prog	N	N	ANALOG	RGB	Mac 600-66	Color bar (vertical, 8 colors x 2)	Color Bar 4
912	49.72	74.55	57.280	832x624	Prog	N	N	ANALOG	RGB	Mac 624-57	Color bar (horizontal, H=0.1%)	Color Bar 5
913	48.78	59.56	64.000	1024x768	Prog	N	N	ANALOG	RGB	Mac 768-60	Color bar (vertical, V=0.1%)	Color Bar 6
914	60.24	74.93	80.000	1024x768	Prog	N	N	ANALOG	RGB	Mac 768-75	OPT06 (color temperature)	Color Temp.
915	68.68	75.06	100.000	1152x870	Prog	N	N	ANALOG	RGB	Mac 870-75	OPT2D (random 256 colors)	Random 256 Color
916	24.82	56.42	21.050	640x400	Prog	N	N	ANALOG	RGB	NEC PC9801	OPT2A (256-color character)	256 Color Chara
917	32.86	79.94	47.840	1120x750	Int	N	N	ANALOG	RGB	NEC PC9801XL	OPT00 (256-block color)	256 Block Color
918	50.02	60.05	78.430	1120x750	Prog	N	N	ANALOG	RGB	NEC 768-60A	OPT03 (8 colors & 16 gray)	8 Color & 16Gray
919	56.48	70.07	75.000	1024x768	Prog	N	N	ANALOG	RGB	NEC 768-70	Gray scale (4 steps)	Gray 4 step
920	64.60	59.93	107.500	1280x1024	Prog	N	N	ANALOG	RGB	NEC 1024-60	Gray scale (horizontal 8 gradations)	Gray 8 step (H)
921	74.88	69.85	127.000	1280x1024	Prog	N	N	ANALOG	RGB	NEC 1024-70	Gray scale (horizontal 16 gradations)	Gray 16 step (H)
922	78.86	74.11	135.000	1280x1024	Prog	N	N	ANALOG	RGB	NEC 1024-75	OPT1B (horizontal 32 gradations of gray)	Gray 32 step (H)
923	48.36	60.08	65.000	1024x768	Prog	N	N	ANALOG	RGB	NEC 768-60B	OPT1C (horizontal 64 gradations of gray)	Gray 64 step (H)

Program No.	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference		Pattern data	Pattern data name
						H	V					
924	61.80	65.95	92.940	1152x900	Prog	N	N	ANALOG	RGB	SUN 900-66	OPT2B (horizontal linear gradation ramp)	Gray 256 step (H)
925	71.73	76.07	105.590	1152x900	Prog	N	N	ANALOG	RGB	SUN 900-76	Gray scale (vertical 8 gradations)	Gray 8 step (V)
926	70.84	84.03	92.940	1024x800	Prog	N	N	ANALOG	RGB	SUN 800-84	Gray scale (vertical 16 gradations)	Gray 16 step (V)
927	81.13	76.11	135.000	1280x1024	Prog	N	N	ANALOG	RGB	SUN 1024-76	OPT36 (vertical 32 gradations of gray)	Gray 32 step (V)
928	63.38	60.02	107.500	1280x1024	Prog	N	N	ANALOG	RGB	SONY NEWS	OPT37 (vertical 64 gradations of gray)	Gra 64 step (V)
929	78.86	74.11	135.000	1280x1024	Prog	N	N	ANALOG	RGB	SONY 1024-74	OPT2C (vertical linear gradation ramp)	Gray 256 step (V)
930	78.86	74.11	135.000	1280x1024	Prog	N	N	ANALOG	RGB	SONY 1024-74	OPT01 (64-gradation block gray)	Gray 64 Block 1
931	48.48	59.64	64.000	1024x768	Prog	N	N	ANALOG	RGB	SGI Indigo768-60	OPT02 (64-gradation block gray)	Gray 64 Block 2
932	77.01	72.38	130.000	1280x1024	Prog	N	N	ANALOG	RGB	SGI Indigo1024-70	OPT34 (circle & crosshatch)	Circle & Cross
933	63.90	60.00	107.350	1280x1024	Prog	N	N	ANALOG	RGB	SGI IRIS4D	OPT0D (crosstalk width 90%)	Cross Talk 90%
934	63.33	59.97	108.170	1280x1024	Prog	N	N	ANALOG	RGB	HP 9000t1	OPT21 (crosstalk width 60%)	Cross Talk 60%
935	78.13	72.00	135.000	1280x1024	Prog	N	N	ANALOG	RGB	HP 9000t2	Black solid	Black
936	54.00	60.00	69.120	1024x864	Prog	N	N	ANALOG	RGB	VAX 768-60	White solid	RGB
937	70.66	66.47	119.840	1280x1024	Prog	N	N	ANALOG	RGB	VAX 1024-66	Red solid	R
938	60.05	75.06	78.780	1024x768	Prog	N	N	ANALOG	RGB	Fujitsu FMV 1024-75	Green solid	G
939	80.66	100.83	108.410	1280x1024	Prog	N	N	ANALOG	RGB	Fujitsu FMV 1024-100	Blue solid	B
940	79.70	74.83	134.370	1280x1024	Prog	N	N	ANALOG	RGB	Fujitsu FMV5166	Magenta solid	R-B
941	80.38	75.12	135.040	1280x1024	Prog	N	N	ANALOG	RGB	Fujitsu FMV5133	Yellow solid	R-G
942	63.74	60.02	108.100	1280x1024	Prog	N	N	ANALOG	RGB	Fujitsu SIGMA	Cyan solid	G-B
943	78.16	71.64	135.060	1280x1024	Prog	N	N	ANALOG	RGB	HITACHI SXGA	Dot (H=20, V=20)	Dot H20 / V20
944	26.35	59.90	22.770	640x400	Prog	N	N	ANALOG	RGB	Panasonic M550	Dot (H=60, V=60)	Dot H60 / V60
945	46.88	75.00	49.500	800x600	Prog	P	P	ANALOG	RGB	VESA600-75	OPT00 (256-block color)	256 Block Color
946					Prog	N	N	ANALOG	RGB		OPT09 (Crosshatch & circle & character)	Total Test
947	31.47	59.95	28.640	746x471	Prog	N	N	ANALOG	RGB	ASTRO SC-2025	OPT26 (SMPTE color version)	SMPTE RP133 COL
948	64.00	59.98	115.21	1400x1050	Prog	N	N	ANALOG	RGB	SXGA+	OPT30 (Window & Edge)	Window & Edge
949	94.64	59.60	265.01	2048x1536	Prog	N	N	ANALOG	RGB	QXGA	OPT0A (Cirle & Line)	Cirle & Line
950	15.73	60.05	13.500	712x484	Int	N	N	NTSC	YPbPr	NTSC (*p3)	Window (Format 0, Flicker 0)	2-3 pull-down Window 1
951	33.75	60.05	74.250	1920x1080	Int	P	P	Tri-Sync (1080)	YPbPr	1080i (*3,*p0)	Window (Format 0, Flicker 0)	2-3 pull-down Window 1
952					Prog	N	N	ANALOG	RGB		Black solid	Black

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
953					Prog	N	N	ANALOG	RGB		White solid	RGB
954					Prog	N	N	ANALOG	RGB		Red solid	R
955					Prog	N	N	ANALOG	RGB		Green solid	G
956	31.22	50.02	46.200	1170x1168	Int	N	N	ANALOG	RGB	MEDICAL-1I	Blue solid	B
957	31. 22	50.03	46.200	1170x584	Prog	N	N	ANALOG	RGB	MEDICAL-1N	Magenta solid	RB
958	30.69	60.06	36.830	947x946	int	N	N	ANALOG	RGB	MEDICAL-2I	Yellow solid	RG
959	30.69	60.07	36.830	947x473	Prog	N	N	ANALOG	RGB	MEDICAL-2N	Cyan solid	GB
960	37.93	85.04	35.500	720x400	Prog	N	N	ANALOG	RGB	VESA400-88	OPT00 (256-block color)	256 Block Color
961	112.50	90.00	243.000	1600x1200	Prog	N	N	ANALOG	RGB	1200-90	OPT1A (ITCH character)	ITCH Character
962					Prog	N	N	ANALOG	RGB		OPT30 (Window & Edge)	Window & Edge
963	63.98	60.02	108.000	1280x1024	Prog	P	P	ANALOG	RGB	VESA1024-60	OPT19 (ITC cross & marker)	ITC Cross & Marker
964	15.63	50.08	13.500	702x574	Int	N	N	SECAM	YPbPr	SECAM (*p2)	OPT0F (NTSC color bar)	NTSC Color Bar
965	31.47	59.94	34.240	864x480	Prog	N	N	ANALOG	RGB	W-VGA	OPT05 (color bar & crosshatch)	Color & Cross
966	37.88	60.32	53.940	1072x600	Prog	N	N	ANALOG	RGB	W-SVGA	OPT07 (pairing)	Pairing
967	48.36	60.00	87.440	1376x768	Prog	N	N	ANALOG	RGB	W-XGA	OPT08 (crosshatch & circle & gray)	Cross & Circle
968	15.73	60.05	13.500	712x484	Int	N	N	NTSC	YPbPr	NTSC (*p3)	OPT0F (NTSC color bar)	NTSC Color Bar
969	15.63	50.08	13.500	702x574	Int	N	N	PAL	YPbPr	PAL (*p2)	OPT0F (NTSC color bar)	NTSC Color Bar
970	67.50	60.00	148.500	1920x1080	Prog	P	P	Tri-Sync (1080)	YPbPr	1080P (*3,*p0)	OPT13 (gamma correction ramp wr2.5)	Gamma Ramp 1
971	67.50	59.94	148.352	1920x1080	Prog	P	P	Tri-Sync (1080)	YPbPr	1080P (*3,*p0)	OPT14 (gamma correction ramp r2.0)	Gamma Ramp 2
972	33.75	60.05	74.250	1920x1080	Int	P	P	Tri-Sync (1080)	YPbPr	1080i (*3,*p0)	OPT15 (gamma correction ramp r0.5)	Gamma Ramp 3
973	33.75	59.99	74.176	1920x1080	Int	P	P	Tri-Sync (1080)	YPbPr	1080i (*3,*p0)	OPT17 (SMPTE RP27.1)	SMPTE PR27.1
974	33.75	60.05	74.250	1920x1035	Int	P	P	Tri-Sync (1035)	YPbPr	1035i (*3,*p1)	OPT25 (SMPTE RP-133)	SMPTE RP133 MONO.
975	33.75	59.99	74.176	1920x1035	Int	P	P	Tri-Sync (1035)	YPbPr	1035i (*3,*p1)	OPT26 (SMPTE color version)	SMPTE RP133 COL
976	45.00	60.00	74.250	1280x720	Prog	P	P	Tri-Sync (720)	YPbPr	720P (*3,*p0)	OPT1D (64 gray + RGBW color)	64 Gray & Color
977	45.00	59.94	74.176	1280x720	Prog	P	P	Tri-Sync (720)	YPbPr	720P (*3,*p0)	OPT1E (gray scale + circle)	Gray & Circle
978	31.50	59.94	27.000	720x483	Prog	N	N	ANALOG	YPbPr	483P (*p2)(NTSC PROG.)	OPT29 (crosshatch & marker)	Cross & Marker
979	31.25	50.00	27.000	720x576	Prog	N	N	ANALOG	YPbPr	PAL*2 (*p2)(PAL PROG.)	OPT26 (SMPTE color version)	SMPTE RP133 COL
980	83.64	60.00	204.750	1792x1344	Prog	N	N	ANALOG	RGB	VESA1344-60	OPT35 (chessboard & window)	1dot ON.OFF

Program	frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
981	83.64	60.00	204.750	1792x1344	Prog	N	N	ANALOG	RGB	VESA1344-60	OPT22 (EDID)	
982	86.33	60.00	218.250	1856x1392	Prog	N	N	ANALOG	RGB	VESA1392-60	OPT33 (19x15 crosshatch & marker)	D.Y.Test
983	86.33	60.00	218.250	1856x1392	Prog	N	N	ANALOG	RGB	VESA1392-60	OPT32 (3 gradation window)	TTL test
984	90.00	60.00	234.000	1920x1440	Prog	N	N	ANALOG	RGB	VESA1440-60	OPT16 (SMPTE color bar)	SMPTE Color Bar
985	90.00	60.00	234.000	1920x1440	Prog	N	P	ANALOG	RGB	VESA1440-60	OPT28 (timing chart)	Timing Chart
986					Prog	N	N	ANALOG	RGB			
987					Prog	N	N	ANALOG	RGB		Center & edge	Center & Edge
988					Prog	N	N	ANALOG	RGB		Edge & diagonal line	Diagonal & Edge 1
989					Prog	N	N	ANALOG	RGB		Edge & diagonal line & center	Diagonal & Edge 2
990					Prog	N	N	ANALOG	RGB		OPT24 (display position adjustment)	Display Position
991					Prog	N	N	ANALOG	RGB		OPT00 (256 block color)	256 Block Color
992					Prog	N	N	ANALOG	RGB			
993					Prog	N	N	ANALOG	RGB		Moving Bar	Moving Bar
994	15.73	60.05	13.500	712x242	Int	N	N	NTSC-M	YPbPr	NTSC-M (*p3)	OPT0F (NTSC color bars)	NTSC Color Bar
995	31.46	59.93	25.175	640x480	Prog	N	N	ANALOG	RGB	VGA480-60		
996	31.46	59.93	25.175	640x480	Prog	N	N	ANALOG	RGB	VGA480-60	OPT80 (image data #1 display)	IMG Disp #1
997	48.08	72.19	50.000	800x600	Prog	P	P	ANALOG	RGB	VESA600-72	OPT81 (image data #2 display)	IMG Disp #2
998	56.48	70.07	75.000	1024x768	Prog	N	N	ANALOG	RGB	VESA768-70	OPT82 (image data #3 display)	IMG Disp #3
999	79.98	75.02	135.000	1280x1024	Prog	P	P	ANALOG	RGB	VESA1024-75	OPT83 (image data #4 display)	IMG Disp #4

* Default timing data (VGA) applies where the timing data is blank.
* N and P of Sync polarity are N=NEGA and P=POSI.
* The value with which V frequency at the time of an interlace was calculated by the display pipe of VG main part in "2 Field" is displayed. The handling description has described the value calculated in "1 Field."
* 3: Tri-level sync signal output.
* pN: Color difference table No. = N.

10.1.2. Program data（PG2 Table）

Program	Horizontal frequency (KHz)	Vertical frequency	Dot clock frequency (MHz)	No. of display dots (HxV)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
							V					
850	15.734	60.054	15.734	712x484	Int	**N**	**N**	NTSC	YPbPr	NTSC-J 4:3 (*p3)	OPT0F（NTSC color bars）	NTSC Color Bar
851	15.734	60.054	15.734	712x484	Int	**N**	**N**	NTSC	YPbPr	NTSC-J 16:9 (*p3)	OPT34 (Crosshatch & circle)	Cross & Circle
852	15.734	60.054	15.734	712x484	Int	**N**	**N**	NTSC	YPbPr	NTSC-J LB (*p3)	OPT34 (Crosshatch & circle)	Cross & Circle
853	15.625	50.080	15.625	702x574	Int	**N**	**N**	PAL	YPbPr	PAL 4:3 (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
854	15.625	50.080	15.625	702x574	Int	**N**	**N**	PAL	YPbPr	PAL 16:9 (*p2)	OPT34 (Crosshatch & circle)	Cross & Circle
855	15.625	50.080	15.625	702x574	Int	**N**	**N**	PAL	YPbPr	PAL LB (*p2)	OPT34 (Crosshatch & circle)	Cross & Circle
856	15.625	50.080	15.625	702x574	Int	**N**	**N**	SECAM	YPbPr	SECAM 4:3 (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
857	15.625	50.080	15.625	702x574	Int	**N**	**N**	SECAM	YPbPr	SECAM 16:9 (*p2)	OPT34 (Crosshatch & circle)	Cross & Circle
858	15.625	50.080	15.625	702x574	Int	**N**	**N**	SECAM	YPbPr	SECAM LB (*p2)	OPT34 (Crosshatch & circle)	Cross & Circle
859	15.734	60.054	15.734	712x484	Int	**N**	**N**	NTSC-M	YPbPr	NTSC-M (*p3)	OPT0F（NTSC color bars）	NTSC Color Bar
860	15.734	60.054	15.734	712x484	Int	**N**	**N**	NTSC-443	YPbPr	NTSC-443 (*p3)	OPT0F（NTSC color bars）	NTSC Color Bar
861	15.734	60.054	15.734	712x484	Int	**N**	**N**	PAL-M	YPbPr	PAL-M (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
862	15.734	60.054	15.734	712x484	Int	**N**	**N**	PAL-60	YPbPr	PAL-60 (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
863	15.625	50.080	15.625	702x574	Int	**N**	**N**	PAL-N	YPbPr	PAL-N (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
864	15.625	50.080	15.625	702x574	Int	**N**	**N**	PAL-Nc	YPbPr	PAL-Nc (*p2)	OPT0F（NTSC color bars）	NTSC Color Bar
865					Prog	N	N	ANALOG	RGB		OPT16（SMPTE color bars）	SMPTE Color Bar
866	31.469	59.940	27.000	720x483	Prog	**N**	**N**	ANALOG	YPbPr	NTSC PROG. (*p2)	100%,100% color bar	100%,100% Color Bar
867	31.469	59.940	27.000	720x483	Prog	**N**	**N**	ANALOG	YPbPr	NTSC PROG. W (*p2)	75%,75% color bar	75%,75% Color Bar
868	31.469	59.940	27.000	720x483	Prog	**N**	**N**	ANALOG	YPbPr	NTSC PROG. LB (*p2)	OPT25（SMPTE RP-133）	SMPTE RP-133
869	31.250	50.000	27.000	720x576	Prog	**N**	**N**	ANALOG	YPbPr	PAL PROG. (*p2)	OPT26（SMPTE color version）	SMPTE RP133 COL
870	31.250	50.000	27.000	720x576	Prog	**N**	**N**	ANALOG	YPbPr	PAL PROG. W (*p2)	256 Gray scale	Gray 256 step
871	31.250	50.000	27.000	720x576	Prog	**N**	**N**	ANALOG	YPbPr	PAL PROG. LB (*p2)	128 Gray scale	Gray 128 step
872					Prog	N	N	ANALOG	RGB		64 Gray scale	Gray 64 step
873	67.500	60.000	148.500	1920x1080	Prog	**P**	**P**	Tri-Sync(1080)	YPbPr	1920x1080@60p (*3*p0)	32 Gray scale	Gray 32 step
874	67.432	59.940	148.352	1920x1080	Prog	**P**	**P**	Tri-Sync(1080)	YPbPr	1920x1080@59.94p (*3*p0)	16 Gray scale	Gray 16 step
875	56.250	50.000	148.500	1920x1080	Prog	**P**	**P**	Tri-Sync(1080)	YPbPr	1920x1080@50p (*3*p0)	8 Gray scale	Gray 8 step

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
876	33.750	30.000	74.250	1920x1080	Prog	P	P	Tri-Sync(1080)	YPbPr	1920x1080@30p (*3*p0)	4 Gray scale	Gray 4 step
877	33.716	29.970	74.176	1920x1080	Prog	P	P	Tri-Sync(1080)	YPbPr	1920x1080@29.97p (*3*p0)	OPT13 (gamma correction ramp)	Gamma Ramp 1
878	28.125	25.000	74.250	1920x1080	Prog	P	P	Tri-Sync(1080)	YPbPr	1920x1080@25p (*3*p0)	OPT14 (gamma correction ramp)	Gamma Ramp 2
879	27.000	24.000	74.250	1920x1080	Prog	P	P	Tri-Sync(1080)	YPbPr	1920x1080@24p (*3*p0)	OPT15 (gamma correction ramp)	Gamma Ramp 3
880	26.973	23.976	74.176	1920x1080	Prog	P	P	Tri-Sync(1080)	YPbPr	1920x1080@23.98p (*3*p0)	OPT2C (256 gray scale V)	Gray 256 step(V)
881	33.750	60.053	74.250	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@60i (*3*p0)	OPT37 (64 gray scaleV)	Gray 64 step(V)
882	33.716	59.940	74.176	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@59.94i (*3*p0)	OPT36 (32 gray scale V)	Gray 32 step(V)
883	28.125	50.000	74.250	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@50i (*3*p0)	16 Gray scale V	Gray 16 step(V)
884	33.750	60.053	74.250	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@30sf (*3*p0)	8 Gray scale V	Gray 8 step(V)
885	33.716	59.940	74.176	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@29.97sf (*3*p0)	4 Gray scale V	Gray 4 step(V)
886	28.125	50.000	74.250	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@25sf (*3*p0)	OPT38 (Ramp scroll (H))	Ramp scroll (H)
887	27.000	48.043	74.250	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@24sf (*3*p0)	OPT39 (Ramp scroll (V))	Ramp scroll (V)
888	26.973	47.995	74.176	1920x1080	Int	P	P	Tri-Sync(1080)	YPbPr	1920x1080@23.98sf (*3*p0)	Moving bar	Moving bar
889					Prog	N	N	ANALOG	RGB		OPT3A(Ramp scroll (diagonal))	Ramp scroll (diagonal)
890	45.000	60.000	74.250	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@60p (*3*p0)	Black	Black
891	44.955	59.940	74.176	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@59.94p (*3*p0)	White	RGB
892	37.500	50.000	74.250	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@50p (*3*p0)	Red	R
893	22.500	30.000	74.250	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@30p (*3*p0)	Green	G
894	22.477	29.970	74.176	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@29.97p (*3*p0)	Blue	B
895	18.750	25.000	74.250	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@25p (*3*p0)	Magenta	RB
896	18.000	24.000	74.250	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@24p (*3*p0)	Yellow	RG
897	17.982	23.976	74.176	1280x720	Prog	P	P	Tri-Sync(720)	YPbPr	1280x720@23.98p (*3*p0)	Cyan	GB
898	33.750	60.000	74.250	1920x1035	Int	P	P	Tri-Sync(1035)	YPbPr	1920x1035@60i (*3*p1)	1dot checker	1dot checker
899	33.750	59.940	74.176	1920x1035	Int	P	P	Tri-Sync(1035)	YPbPr	1920x1035@59.94i (*3*p1)	Checker(OPT3C)	Checker
900	31.250	50.000	74.250	1920x1080	Int	P	P	Tri-1250	YPbPr	SMPTE295Mi (*p1)	Sub pixel checker	Sub pixel checker
901	62.500	50.000	148.500	1920x1080	Prog	P	P	Tri-1250	YPbPr	SMPTE295Mp (*p1)	OPT00 (256 collors block color)	256 Block Color
902	31.250	50.000	48.000	1280x1152	Int	P	P	1152 BI	YPbPr	AUS1152i(*p1)	Moving Window 1	Moving Window 1
903	31.250	50.000	72.000	1920x1080	Int	P	P	1250 BI	YPbPr	AUS 1080i (*p1)	Moving Window 2	Moving Window 2
904					Prog	N	N	ANALOG	RGB		Moving Window 3	Moving Window 3

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity			Color difference	Timing data name		Pattern data name
						H	V					
905					Prog	N	N	ANALOG	RGB		Flicker Window 1	Flicker Window 1
906					Prog	N	N	ANALOG	RGB		Flicker Window 2	Flicker Window 2
907					Prog	N	N	ANALOG	RGB		Flicker Window 3	Flicker Window 3
908					Prog	N	N	ANALOG	RGB		Flicker Window 4	Flicker Window 4
909					Prog	N	N	ANALOG	RGB	EIA640x480p@59.94 (*p0)	OPT2A (256-color character)	256 Color Chara
910	31.500	60.000	25.200	640x480	Prog	**N**	**N**	ANALOG	RGB	EIA640x480p@60 (*p0)	OPT2D (Random 256-color)	Random 256 Color
911	31.469	59.940	27.000	720x480	Prog	**N**	**N**	ANALOG	RGB	EIA720x480p@59.94 (*p0)	OPT01 (64-gradation block gray)	Gray 64 Block 1
912	31.500	60.000	27.027	720x480	Prog	**N**	**N**	ANALOG	RGB	EIA720x480p@60 (*p0)	OPT02 (64-gradation block gray)	Gray 64 Block 2
913	31.469	59.940	27.000	720x480	Prog	**N**	**N**	ANALOG	RGB	EIA720x480pW@59.94 (*p0)	OPT03 (8 color bars & 16 gray scale)	8 Color & 16 Gray
914	31.500	60.000	27.027	720x480	Prog	**N**	**N**	ANALOG	RGB	EIA720x480pW@60 (*p0)	OPT04 (Gray scale & crosshatch)	Gray & Cross
915	44.955	59.939	74.175	1280x720	Prog	**P**	**P**	ANALOG	RGB	EIA1280x720p@59.94 (*p0)	OPT05 (Color bar & crosshatch)	Color & Cross
916	45.000	60.000	74.250	1280x720	Prog	**P**	**P**	ANALOG	RGB	EIA1280x720p@60 (*p0)	OPT06 (Color temperature)	Color Temp.
917	33.716	59.939	74.175	1920x1080	Int	**P**	**P**	ANALOG	RGB	EIA1920x1080i@59.94 (*p0)	OPT07 (Pairing)	Pairing
918	33.750	60.000	74.250	1920x1080	Int	**P**	**P**	ANALOG	RGB	EIA1920x1080i@60 (*p0)	OPT08 (Crosshatch & circle & gray)	Cross & Circle
919					Prog	N	N	ANALOG	RGB		OPT09 (Crosshatch & circle & character)	Total Test
920					Prog	N	N	ANALOG	RGB		OPT0A (Circle & line)	Circle & Line
921					Prog	N	N	ANALOG	RGB		OPT0B (Character edge (H))	H Character Line
922					Prog	N	N	ANALOG	RGB		OPT0C (Character edge (O))	O Character Line
923	67.432	59.939	148.350	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@59.94 (*p2)	OPT0D (Crosstalk (width 90%))	Cross Talk 90%
924	67.500	60.000	148.500	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@60 (*p2)	OPT21 (Crosstalk (width 60%))	Cross Talk 60%
925	31.250	50.000	27.000	720x576	Prog	**N**	**N**	ANALOG	RGB	EIA720x576p@50 (*p0)	OPT10 (Sine wave scroll)	Sign Wave Scroll
926	31.250	50.000	27.000	720x576	Prog	**N**	**N**	ANALOG	RGB	EIA720x576pW@50 (*p0)	OPT11 (Multi burst)	Multi Burst
927	37.500	50.000	74.250	1280x720	Prog	**P**	**P**	ANALOG	RGB	EIA1280x720p@50 (*p0)	OPT12 (10 steps & 1/10 MHz)	1/10MHz x 10step
928	28.125	50.000	74.250	1920x1080	Int	**P**	**P**	ANALOG	RGB	EIA1920x1080i@50 (*p0)	OPT17 (SMPTE PR27.1)	SMPTE PR27.1
929					Prog	N	N	ANALOG	RGB	EIA640x480p@59.94 (*p0)	OPT18 (ITC pattern 9 windows)	ITC 9 Window
930					Prog	N	N	ANALOG	RGB	EIA640x480p@59.94 (*p0)	OPT19 (ITC pattern crosshatch & marker)	ITC Cross & Marker
931	56.250	50.000	148.500	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@50 (*p0)	OPT1A (ITC pattern H character)	ITC H Character
932	26.973	23.976	74.175	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@23.97 (*p2)	OPT1D (64 gray + RGBW color bar superimposing (full color))	64 Gray & Color
933	27.000	24.000	74.250	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@24 (*p2)	OPT2F (256 gray + RGBW color bar superimposing (full color))	16 Gray & Color

Program No.	Horizontal frequency (KHz)	Vertical frequency	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
934	28.125	25.000	74.250	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@25 (*p2)	OPT1E（Gray scale + circle）	Gray & Circle
935	33.716	29.970	74.175	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@29.97 (*p0)	OPT20（Corner & center point marker）	Corner & Center
936	33.750	30.000	74.250	1920x1080	Prog	**P**	**P**	ANALOG	RGB	EIA1920x1080p@30 (*p0)	OPT24（Display position adjustor）	Display Position
937					Prog	**N**	**N**	ANALOG	RGB		OPT27 (Song of youth)	Words
938					Prog	N	N	ANALOG	RGB		OPT28 (Timing chart)	Timing Chart
939					Prog	N	N	ANALOG	RGB		OPT0E (DDC pattern Func5 **選択**)	DDC pattern
940	37.861	85.080	31.500	640x350	Prog	**P**	N	ANALOG	RGB	VESA640x350@85 (*p0)	OPT23 (DDC pattern Dsub)	DDC pattern
941	37.861	85.080	31.500	640x400	Prog	**N**	**P**	ANALOG	RGB	VESA640x400@85 (*p0)	OPT22 (DDC pattern DVI)	DDC pattern
942	37.927	85.039	35.500	720x400	Prog	**N**	**P**	ANALOG	RGB	VESA720x400@85 (*p0)	Character list 7x9	Character List
943	31.469	59.940	25.175	640x480	Prog	**N**	**N**	ANALOG	RGB	VESA640x480@60 (*p0)	Character 1(H 5x7 / 10x14)	H Character 1
944	37.861	72.809	31.500	640x480	Prog	**N**	**N**	ANALOG	RGB	VESA640x480@72 (*p0)	Character 1(H 7x9 / 14x18)	H Character 2
945	37.500	75.000	31.500	640x480	Prog	**N**	**N**	ANALOG	RGB	VESA640x480@75 (*p0)	Character 1(H 16x16 / 32x32)	H Character 3
946	43.269	85.008	36.000	640x480	Prog	**N**	**N**	ANALOG	RGB	VESA640x480@85 (*p0)	Character 2(H 5x7 / 10x14)	H Character 4
947	31.020	60.000	33.750	848x480	Prog	**P**	**P**	ANALOG	RGB	VESA848x480@60 (*p0)	Character 2(H 7x9 / 14x18)	H Character 5
948	35.156	56.250	36.000	800x600	Prog	**P**	**P**	ANALOG	RGB	VESA800x600@56 (*p0)	Character 2(H 16x16 / 32x32)	H Character 6
949	37.879	60.317	40.000	800x600	Prog	**P**	**P**	ANALOG	RGB	VESA800x600@60 (*p0)	Character 1("BI"7x9 / 64x64)	Chinese Chara 1
950	48.077	72.188	50.000	800x600	Prog	**P**	**P**	ANALOG	RGB	VESA800x600@72 (*p0)	Character me(#1 18x18)	me Character 1
951	46.875	75.000	49.500	800x600	Prog	**P**	**P**	ANALOG	RGB	VESA800x600@75 (*p0)	Character me(VESA specifications 18x18)	me Character 2
952	53.674	85.061	56.250	800x600	Prog	**P**	**P**	ANALOG	RGB	VESA800x600@85 (*p0)	Burst（Format 0）	Burst 1
953	35.522	43.479 (Interlaced)	44.900	1024x768	Int	**P**	**P**	ANALOG	RGB	VESA1024x768@43 (*p0)	Burst（Format 1）	Burst 2
954	48.363	60.004	65.000	1024x768	Prog	**N**	**N**	ANALOG	RGB	VESA1024x768@60 (*p0)	Burst（Format 2）	Burst 3
955	56.476	70.069	75.000	1024x768	Prog	**N**	**N**	ANALOG	RGB	VESA1024x768@70 (*p0)	Burst（Format 3）	Burst 4
956	60.023	75.029	78.780	1024x768	Prog	**P**	**P**	ANALOG	RGB	VESA1024x768@75 (*p0)	Circle（Format 0）	Circle 1
957	68.677	84.997	94.500	1024x768	Prog	**P**	**P**	ANALOG	RGB	VESA1024x768@85 (*p0)	Circle（Format 1）	Circle 2
958	67.500	75.000	108.000	1152x864	Prog	**P**	**P**	ANALOG	RGB	VESA1152x864@75 (*p0)	Circle（Format 2）	Circle 3
959	47.396	59.995	68.250	1280x768	Prog	**P**	**N**	ANALOG	RGB	VESA1280x768@60 (*p0)	Circle（Format 3）	Circle 4
960	47.776	59.870	79.500	1280x768	Prog	**N**	**P**	ANALOG	RGB	VESA1280x768@60 (*p0)	Circle（Format 4）	Circle 5
961	60.289	74.893	102.250	1280x768	Prog	**N**	**P**	ANALOG	RGB	VESA1280x768@75 (*p0)	Circle（Format 5）	Circle 6

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	difference	Timing data name	Pattern data	Pattern data name
						H	V					
962	68.633	84.837	117.500	1280x768	Prog	N	P	ANALOG	RGB	VESA1280x768@85 (*p0)	Circle (Format 6)	Circle 7
963	60.000	60.000	108.000	1280x960	Prog	P	P	ANALOG	RGB	VESA1280x960@60 (*p0)	Window (Format 0,Flicker 0)	Window 1
964	85.938	85.002	148.500	1280x960	Prog	P	P	ANALOG	RGB	VESA1280x960@85 (*p0)	Window (Format 1,Flicker 0)	Window 2
965	63.981	60.020	108.000	1280x1024	Prog	P	P	ANALOG	RGB	VESA1280x1024@60 (*p0)	Window (Format 2,Flicker 0)	Window 3
966	79.976	75.025	135.000	1280x1024	Prog	P	P	ANALOG	RGB	VESA1280x1024@75 (*p0)	Window (Format 3,Flicker 0)	Window 4
967	91.146	85.024	157.500	1280x1024	Prog	P	P	ANALOG	RGB	VESA1280x1024@85 (*p0)	Window (Format 4,Flicker 0)	Window 5
968	47.712	60.015	85.500	1360x768	Prog	P	P	ANALOG	RGB	VESA1360x768@60 (*p0)	Window (Format 5,Flicker 0)	Window 6
969	64.744	59.948	101.000	1400x1050	Prog	P	N	ANALOG	RGB	VESA1400x1050@60 (*p0)	Window (Format 8,Flicker 7)	Moving Window 1
970	65.317	59.978	121.750	1400x1050	Prog	N	P	ANALOG	RGB	VESA1400x1050@60 (*p0)	Window (Format 9,Flicker 7)	Moving Window 2
971	82.278	74.867	156.000	1400x1050	Prog	N	P	ANALOG	RGB	VESA1400x1050@75 (*p0)	Window (Format E,Flicker 7)	Moving Window 3
972	93.881	84.960	179.500	1400x1050	Prog	N	P	ANALOG	RGB	VESA1400x1050@85 (*p0)	Window (Format F,Flicker 7)	Window Level
973	75.000	60.000	162.000	1600x1200	Prog	P	P	ANALOG	RGB	VESA1600x1200@60 (*p0)	Window (Format 0,Flicker 1)	Flicker Window 1
974	81.250	65.000	175.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1600x1200@65 (*p0)	Window (Format 0,Flicker 3)	Flicker Window 2
975	87.500	70.000	189.000	1600x1200	Prog	P	P	ANALOG	RGB	VESA1600x1200@70 (*p0)	Window (Format 0,Flicker 5)	Flicker Window 3
976	93.750	75.000	202.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1600x1200@75 (*p0)	Window (Format 0,Flicker 7)	Flicker Window 4
977	106.250	85.000	229.500	1600x1200	Prog	P	P	ANALOG	RGB	VESA1600x1200@85 (*p0)	Window (Format 0,Flicker 0)	2-3 pull-down
978	83.640	60.000	204.750	1792x1344	Prog	N	P	ANALOG	RGB	VESA1792x1344@60 (*p0)	dot (H=20,V=20)	Dot H20/V20
979	106.270	74.997	261.000	1792x1344	Prog	N	P	ANALOG	RGB	VESA1792x1344@75 (*p0)	dot (H=60,V=60)	Dot H60/V60
980	86.333	59.995	218.250	1856x1392	Prog	N	P	ANALOG	RGB	VESA1856x1392@60 (*p0)	0% window	0% window
981	112.500	75.000	288.000	1856x1392	Prog	N	P	ANALOG	RGB	VESA1856x1392@75 (*p0)	5% window	5% window
982	74.038	59.950	154.000	1920x1200	Prog	P	N	ANALOG	RGB	VESA1920x1200@60 (*p0)	10% window	10% window
983	74.556	59.885	193.250	1920x1200	Prog	N	P	ANALOG	RGB	VESA1920x1200@60 (*p0)	20%window	20%window
984	94.038	74.930	245.250	1920x1200	Prog	N	P	ANALOG	RGB	VESA1920x1200@75 (*p0)	30% window	30% window
985	107.184	84.932	281.250	1920x1200	Prog	N	P	ANALOG	RGB	VESA1920x1200@85 (*p0)	40% window	40% window
986	90.000	60.000	234.000	1920x1440	Prog	N	P	ANALOG	RGB	VESA1920x1440@60 (*p0)	50%window	50%window
987	112.500	75.000	297.000	1920x1440	Prog	N	P	ANALOG	RGB	VESA1920x1440@75 (*p0)	60% window	60% window
988					Prog	N	N	ANALOG	RGB		70% window	70% window
989					Prog	N	N	ANALOG	RGB		80% window	80% window
990					Prog	N	N	ANALOG	RGB		90% window	90% window

Program	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)	No. of display dots (H×V)	Int / Prog	Sync polarity		Sync Type	Color difference	Timing data name	Pattern data	Pattern data name
						H	V					
991					Prog	N	N	ANALOG	RGB		100% window	100% window
992					Prog	N	N	ANALOG	RGB		OPT80 (pattern #5)	IMG Disp #1
993					Prog	N	N	ANALOG	RGB		OPT81 (pattern #6)	IMG Disp #2
994					Prog	N	N	ANALOG	RGB		OPT82 (pattern #7)	IMG Disp #3
995					Prog	N	N	ANALOG	RGB		OPT83 (pattern #8)	IMG Disp #4
996					Prog	N	N	ANALOG	RGB		OPT84 (pattern #9)	IMG Disp #5
997					Prog	N	N	ANALOG	RGB		OPT85 (pattern #10)	IMG Disp #6
998					Prog	N	N	ANALOG	RGB		OPT86 (pattern #11)	IMG Disp #7
999					Prog	N	N	ANALOG	RGB		OPT87 (pattern #12)	IMG Disp #8

* Default timing data (EIA640x480p@59.94) applies where the timing data is blank.
* N and P of Sync polarity are N=NEGA and P=POSI.
* The value with which V frequency at the time of an interlace was calculated by the display pipe of VG main part in "2 Field" is displayed. The handling description has described the value calculated in "1 Field."
* 3: Tri-level sync signal output.
* pN: Color difference table No. = N.

10.1.3. Optional pattern data

CODE	PATTERN	CODE	PATTERN	CODE	PATTERN	CODE	PATTERN
00	256-color block color	10	Sine wave scroll	20	Corner & center point marker	30	Center, corner window & edge marker
01	64-gradation block gray (from white to black)	10 Appendices11	Multi burst	21	Crosstalk (width 60%)	31	32-gradation gray scale (H)
02	64-gradation block gray (from black to white)	12	10 steps & 1/10 MHz	22	DDC DVI	32	3-gradation window
03	8 color bars & 16 gray scale	13	Gamma correction ramp wr=25	23	DDC DSUB	33	19x15 crosshatch & marker
04	Gray scale & crosshatch	14	Gamma correction ramp r=2.0	24	Display position adjustor	34	Crosshatch & circle
05	Color bar & crosshatch	15	Gamma correction ramp r=0.5	25	SMPTE RP-133	35	Chessboard & window
06	Color temperature	16	SMPTE color bars	26	SMPTE color version	36	32-gradation gray scale (V)
07	Pairing	17	SMPTE PR27.1	27	Song of youth	37	64-gradation gray scale (V)
08	Crosshatch & circle & gray	18	ITC pattern 9 windows	28	Timing chart	38	Ramp scroll (H)
09	Crosshatch & circle & character	19	ITC pattern crosshatch & marker	29	Crosshatch & marker	39	Ramp scroll (V)
0A	Circle & line	1A	ITC pattern H character	2A	256-color block color "Color" letters	3A	Ramp scroll (diagonal)
0B	Character edge (H)	1B	32-gradation gray scale (H)	2B	Linear gradation ramp H direction	3B	ANSI pattern (setup)
0C	Character edge (O)	1C	64-gradation gray scale (H)	2C	Linear gradation ramp V direction	3C	ANSI pattern (contrast)
0D	Crosstalk (width 90%)	1D	64-gray + RGBW color bar superimposed	2D	Random 256-color color bar	3D	ANSI pattern (9 points)
0E	DDC pattern	1E	Gray scale + circle	2E	DDC pattern (binary)	3E	ANSI pattern (horizontal resolution)
0F	NTSC color bars	1F	128-gradation gray scale (H)	2F	256 gray + RGBW color bar superimposing (full color)	3F	ANSI pattern (vertical resolution)

* 0H through BFH are image data (#1 to #64) displays.

CAUTION

When program is selected for the EXEC mode of HDCP and pattern is selected for its DISP mode, the DDC patterns of 0E and 2E are not displayed. Only the HDCP execution is performed.

10.1.4. User character data

Code	Description	Cell size
F0	"me" letters #1	18x18
F1	"me" letters #2 (VESA specifications)	18x18
F2	Chinese character "AI"	64x64
F3	Chinese character "BI"	64x64
F4	Chinese character "TAKA"	32x32
F5	Chinese character "KIRI"	32x32
F6	Chinese character "KEN"	32x32
F7	Burst	64x64
F8		
F9		
FA		
FB		
FC		
FD		
FE		
FF		

10.1.5. YPbPr coefficient tables

There are 10 color difference (YPbPr) coefficient tables. The contents of each of these tables are shown below.

	a	b	c	d	e	f	g	H	i
#0	0.2126	0.7152	0.0722	0.1146	0.3854	0.5000	0.5000	0.4542	0.0458
#1	0.2120	0.7010	0.0870	0.1161	0.3839	0.5000	0.5000	0.4448	0.0552
#2	0.2990	0.5870	0.1140	0.1687	0.3313	0.5000	0.5000	0.4187	0.0813
#3	0.2990	0.5870	0.1140	0.1687	0.3313	0.5000	0.5000	0.4187	0.0813
#4 to #9					Same content as #0 (not used)				

* The data given in the tables contains only the above decimal places (x1000).

Correlation with YPbPr

y = a*R + b*G + c*B
pb = -d*R - e*G + f*B
pr = g*R - h*G - i*B

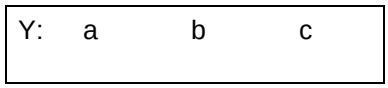
Correlation with SMPTE

No.		
#0	SMPTE 274M,296M,RP-177	1920x1080, 1280x720
#1	SMPTE 240M	Hivision (1920x1035)
#2	SMPTE 293M	720x483
#3	SMPTE 125M	NTSC

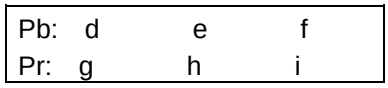
<Correlation with VG-848 functions>

The color difference coefficients can be edited using the YPbPr coefficient table editing function. The correlation between the coefficients and editing screen is shown below.

Y

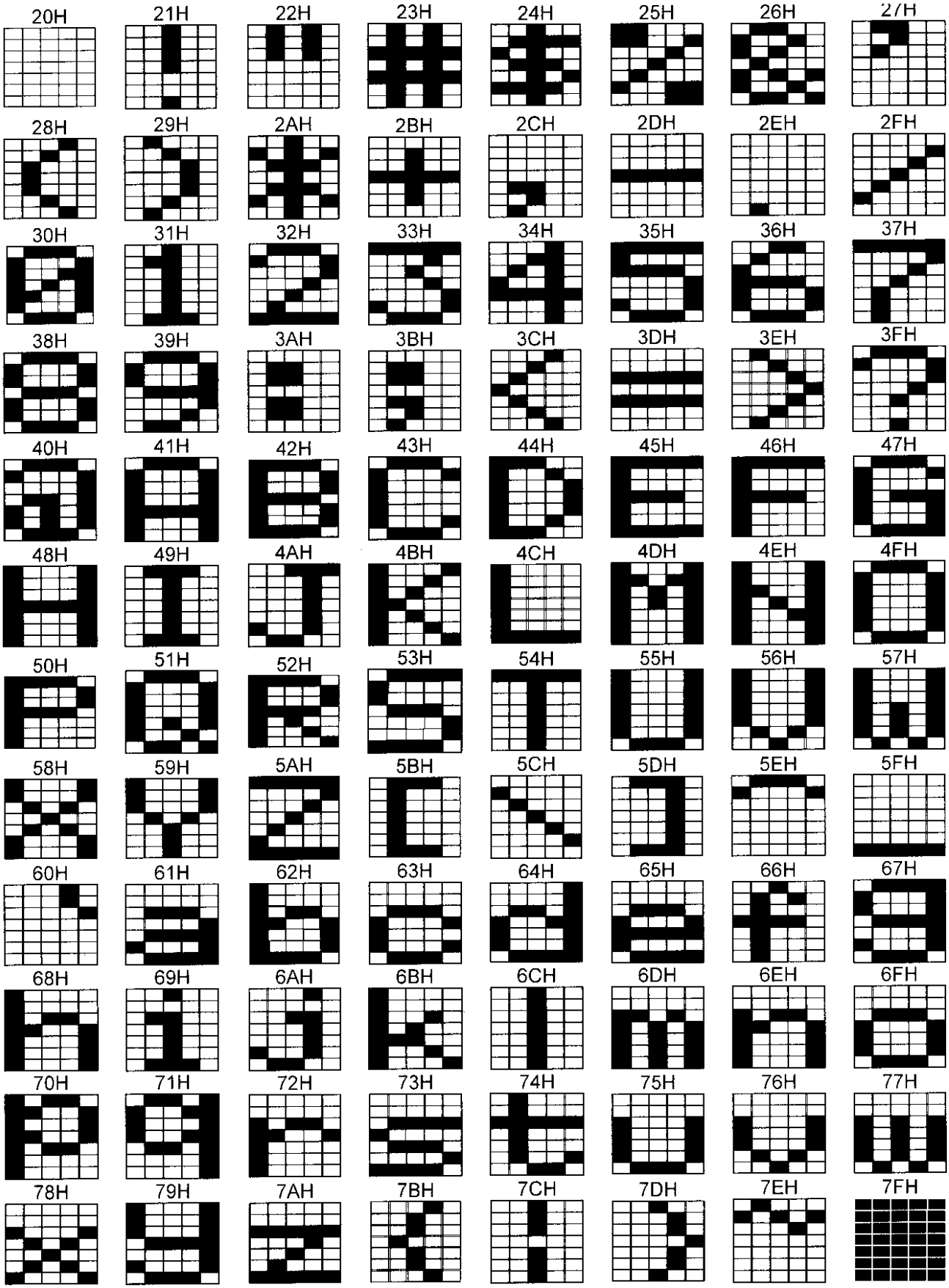


Pb, Pr

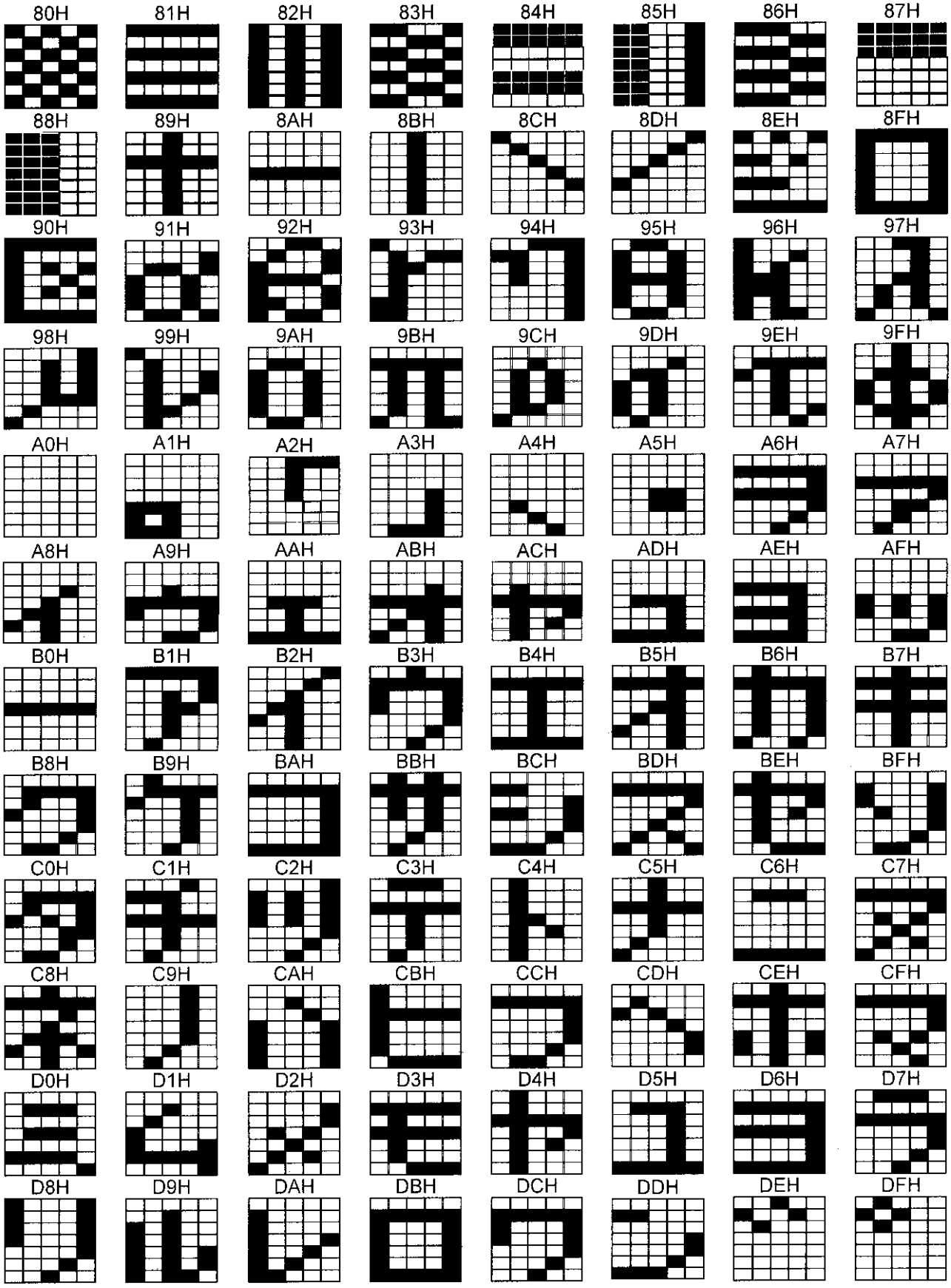


10.1.6. Character codes

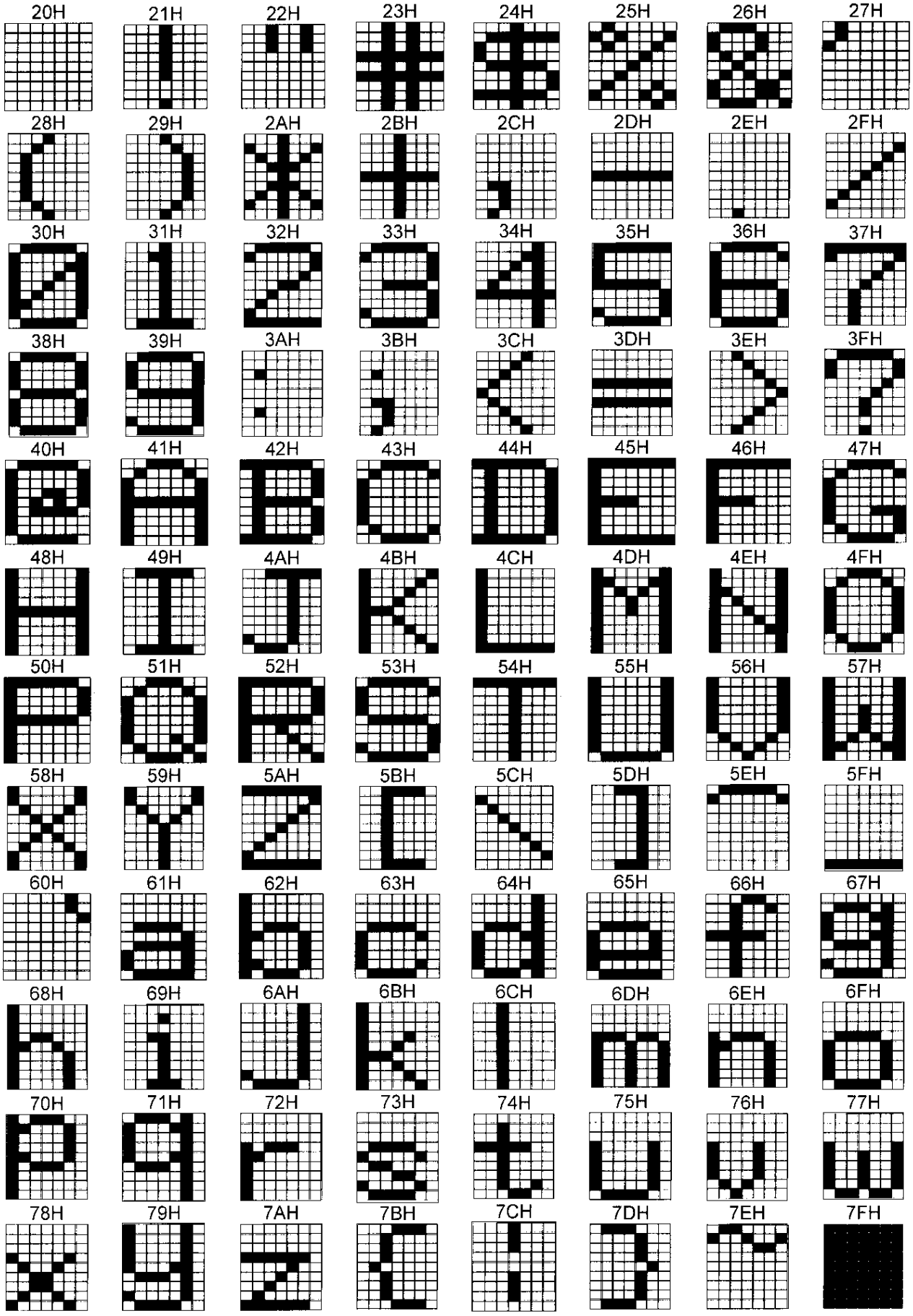
■ **(5x7) Character pattern table 1**



■ **(5x7) Character pattern table 2**

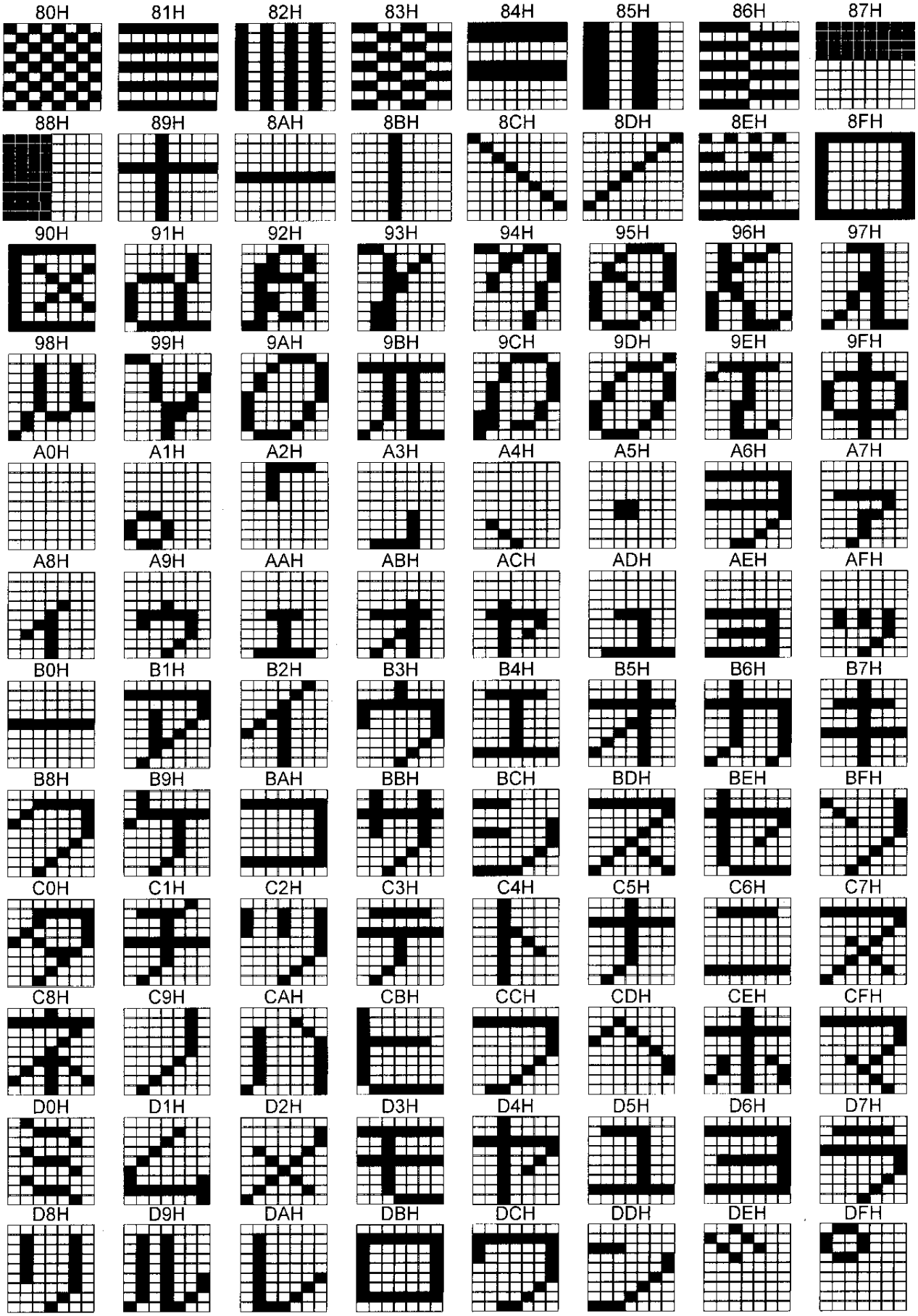


■ **(7x9) Character pattern table 1**

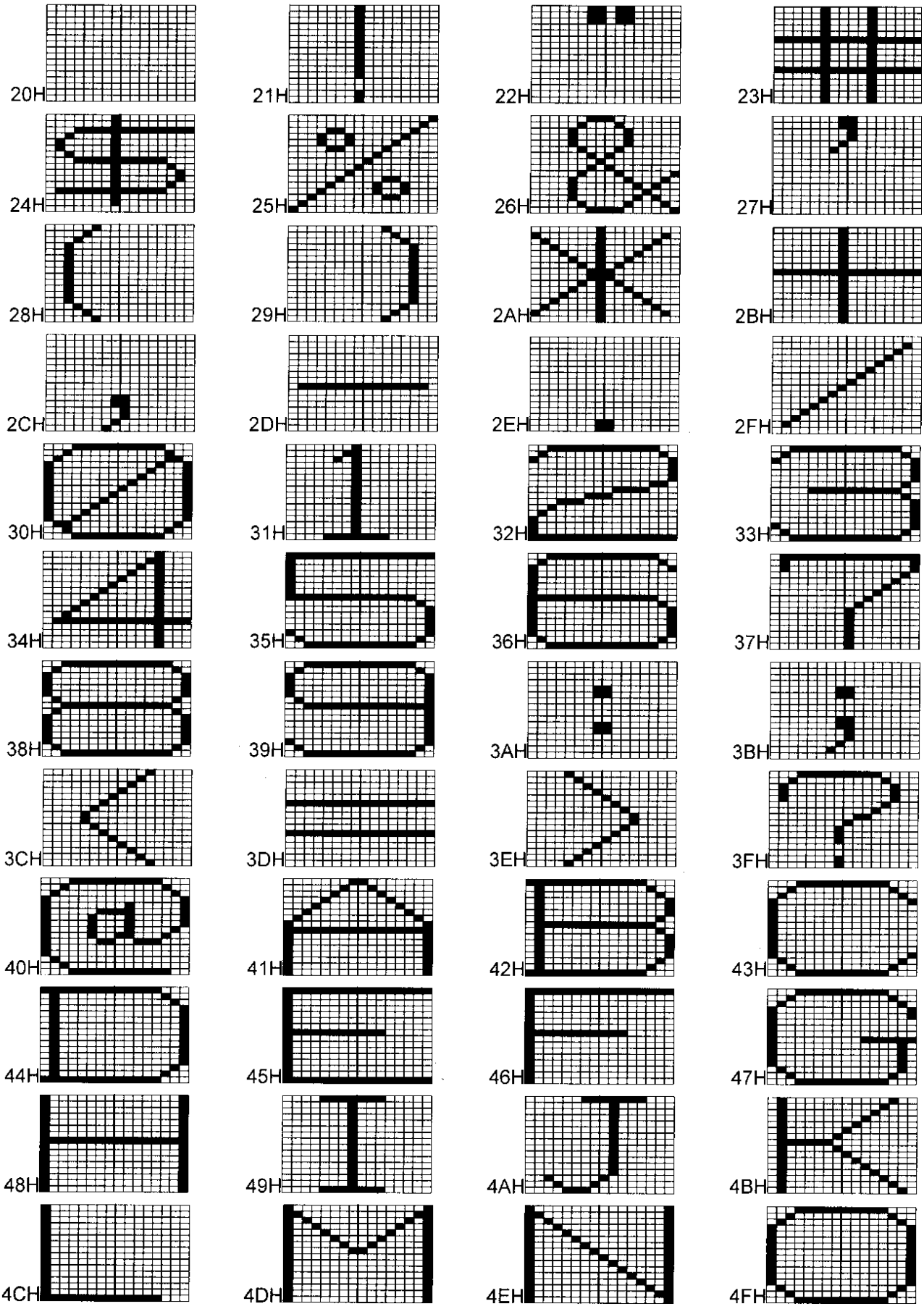


■ **(7x9) Character pattern table 2**

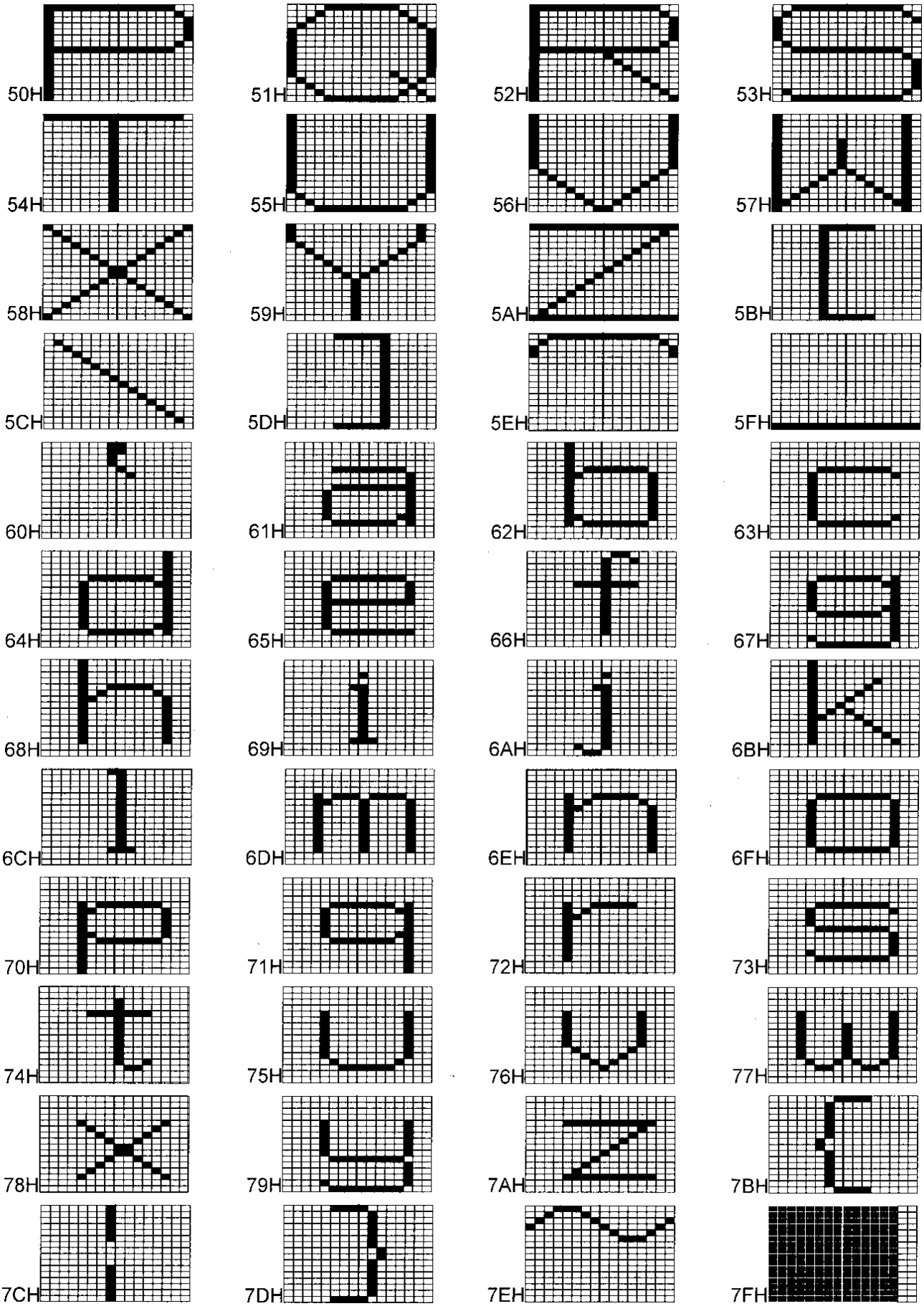
* 8x9 dots are used for the display from 80H to 8FH.



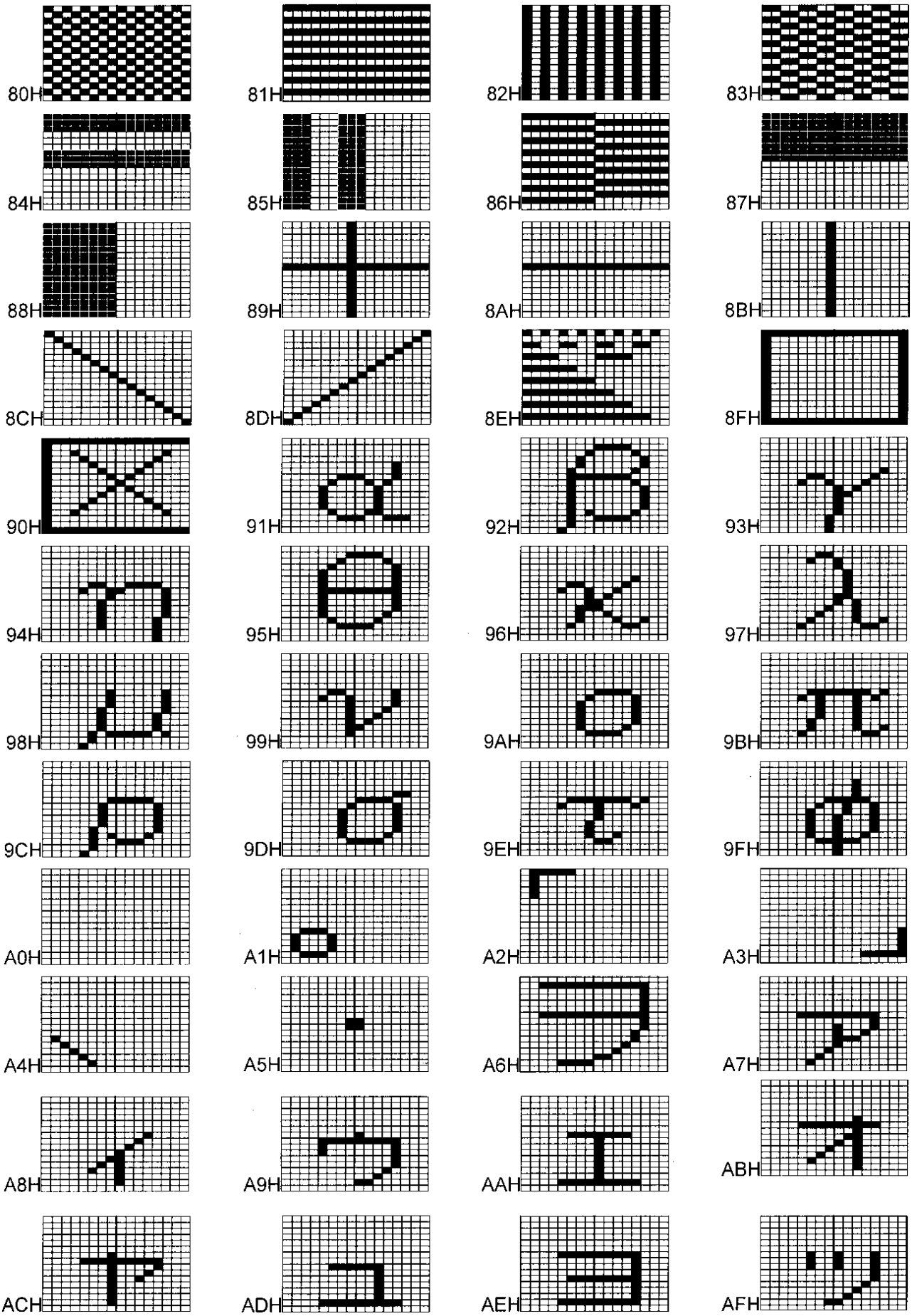
■ **(16x16) Character pattern table 1**



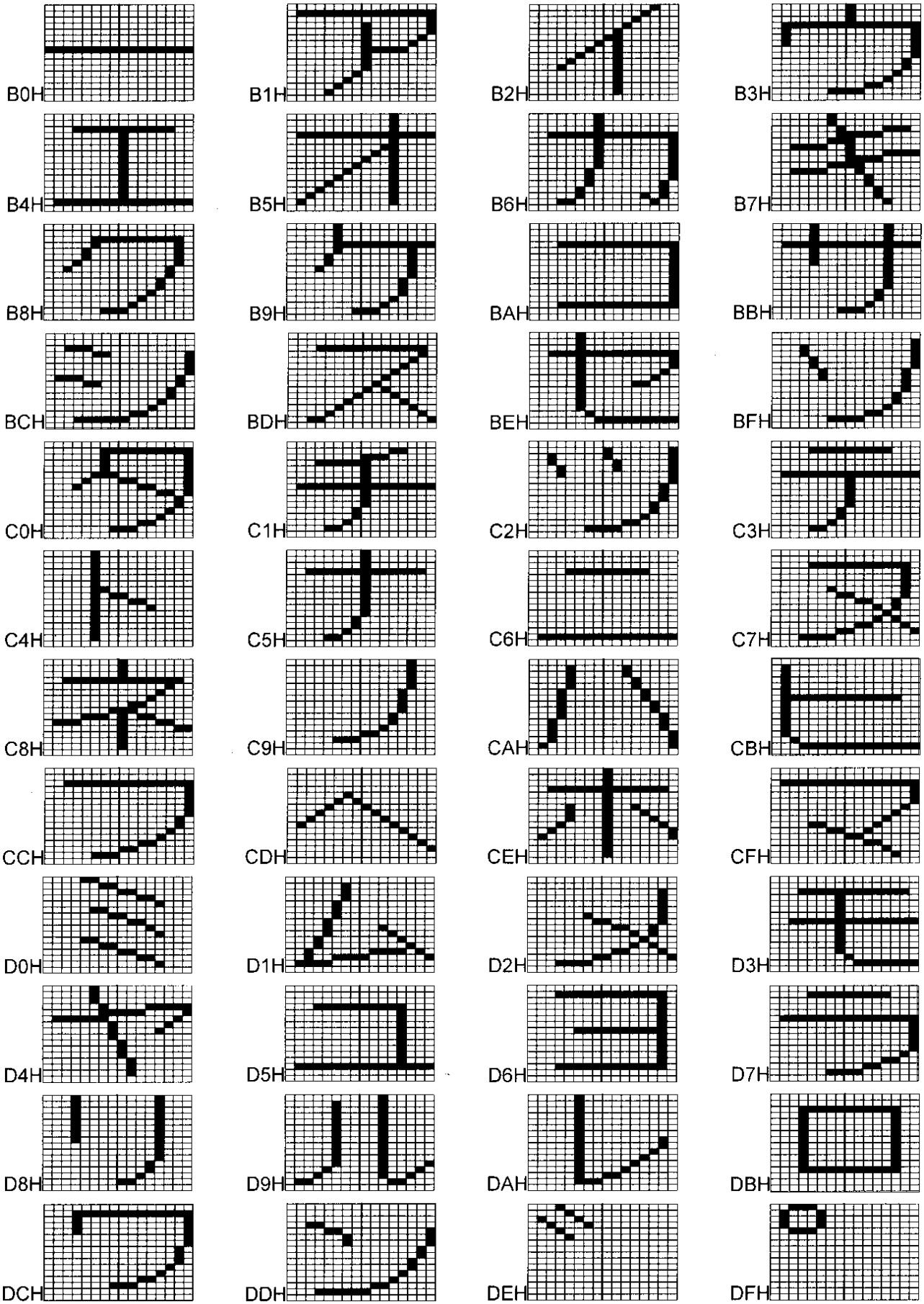
■ **(16x16) Character pattern table 2**



■ **(16x16) Character pattern table 3**

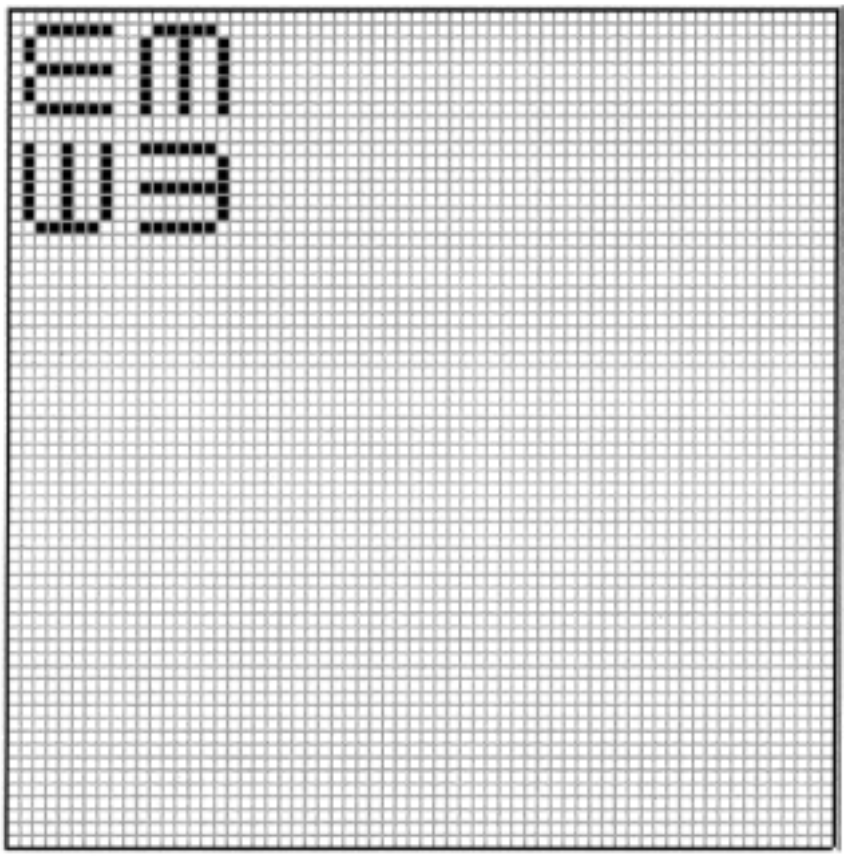


■ **(16x16) Character pattern table 4**

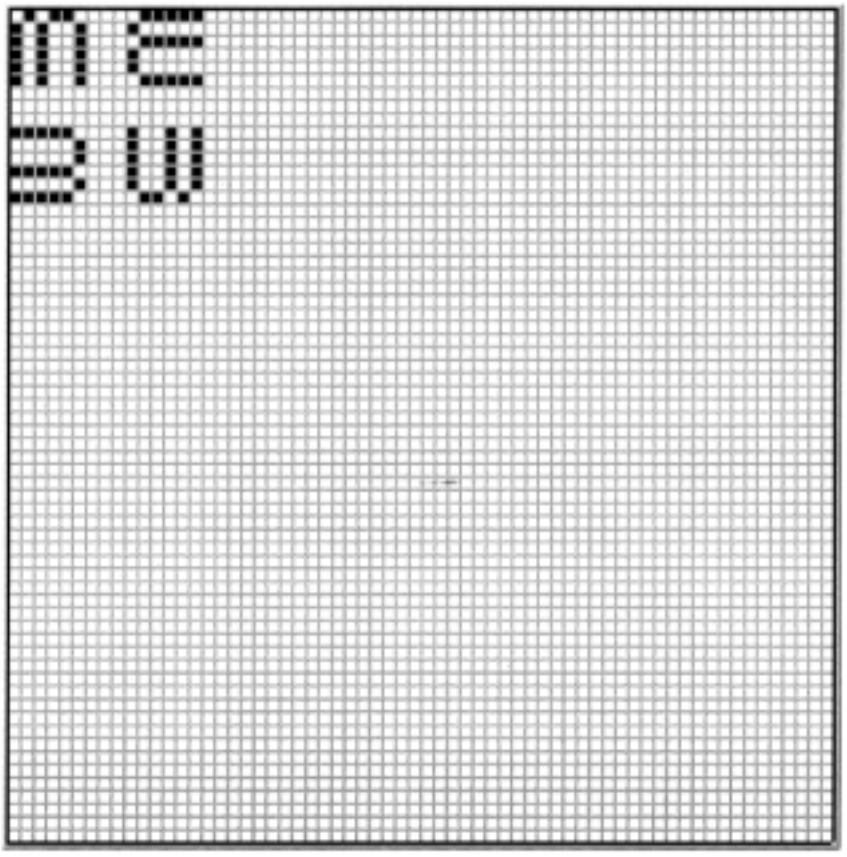


■ **(18x18) Character pattern table**

F0H

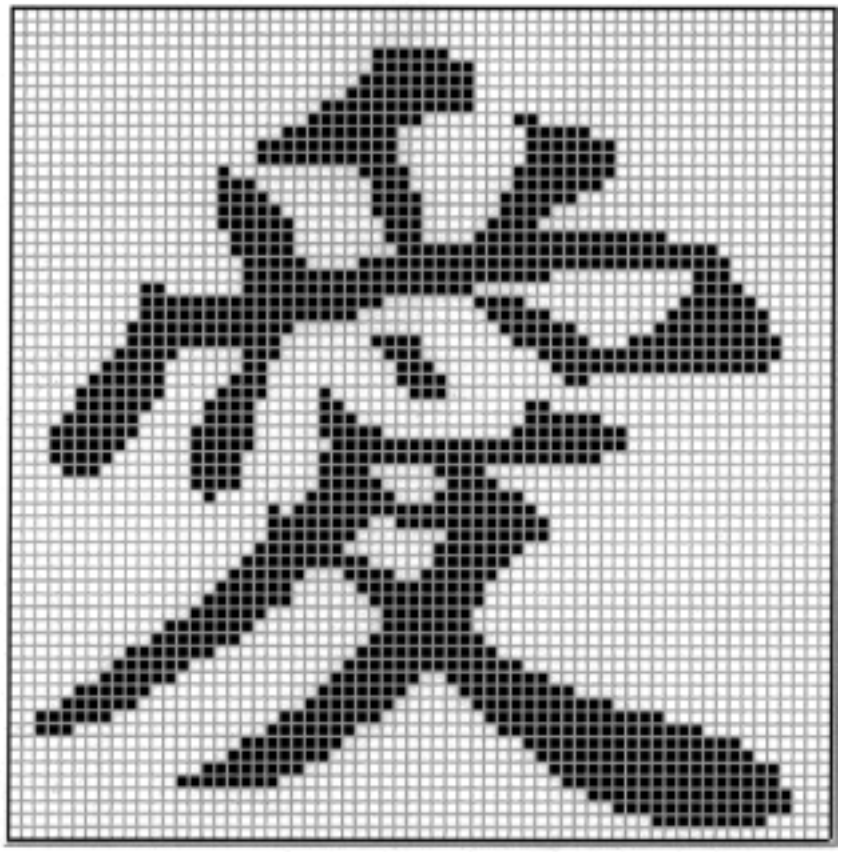


F1H

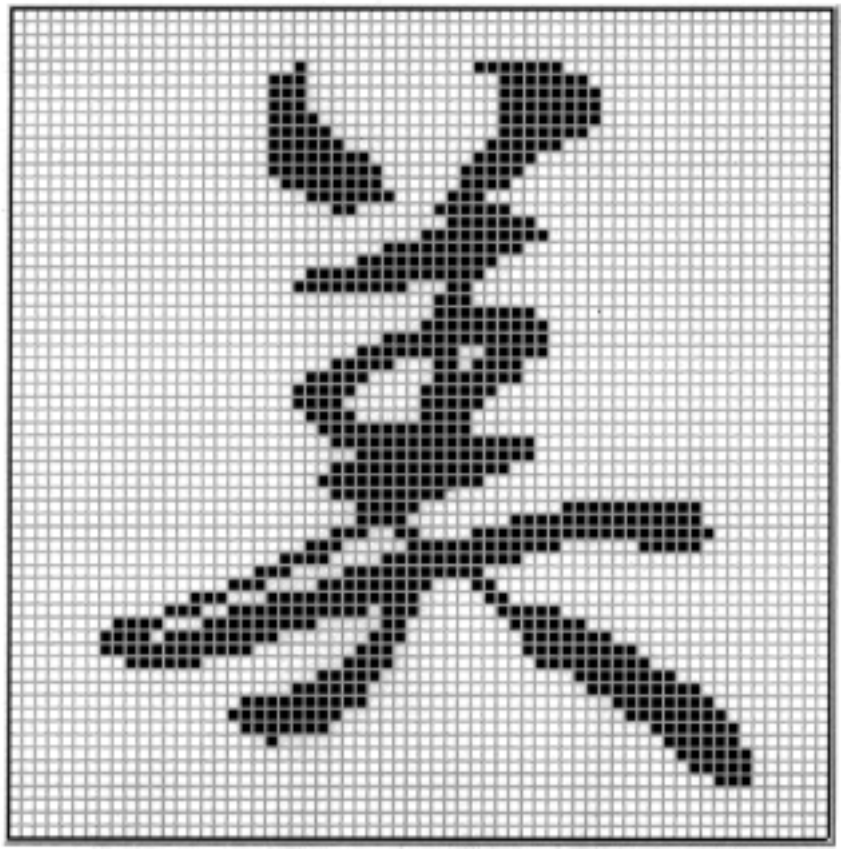


■ **(64x64) Character pattern table**

F2H

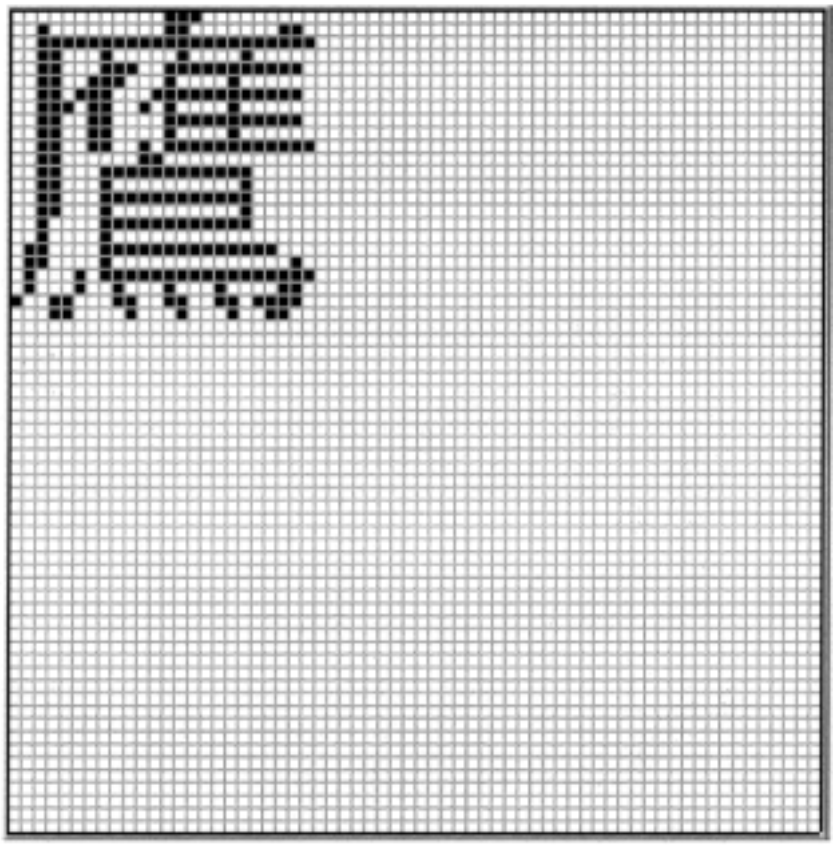


F3H

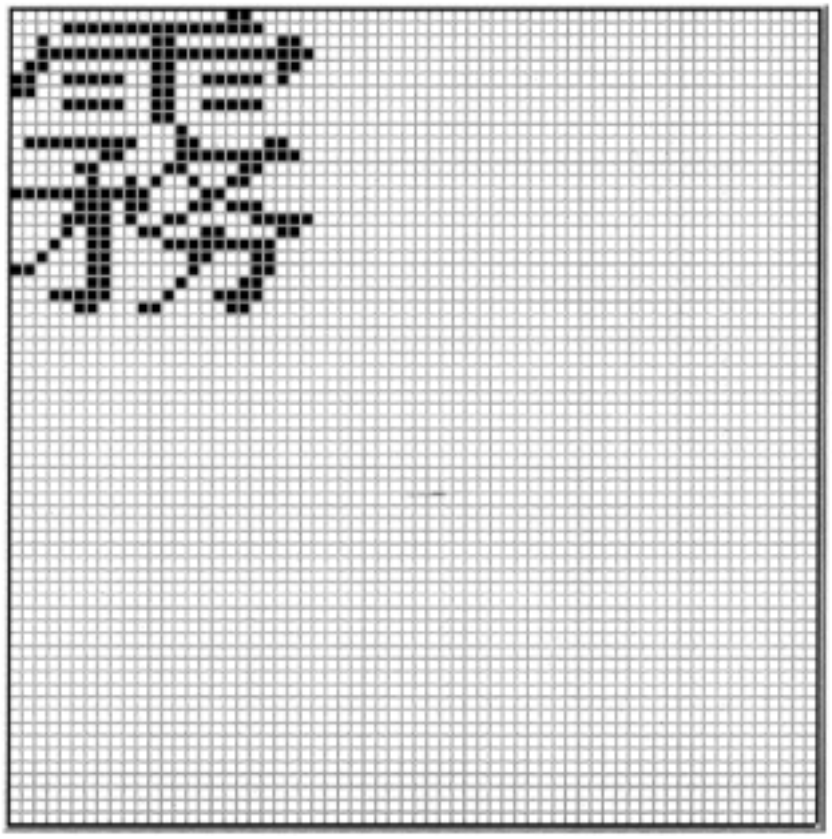


■ **(32x32) Character pattern table**

F4H

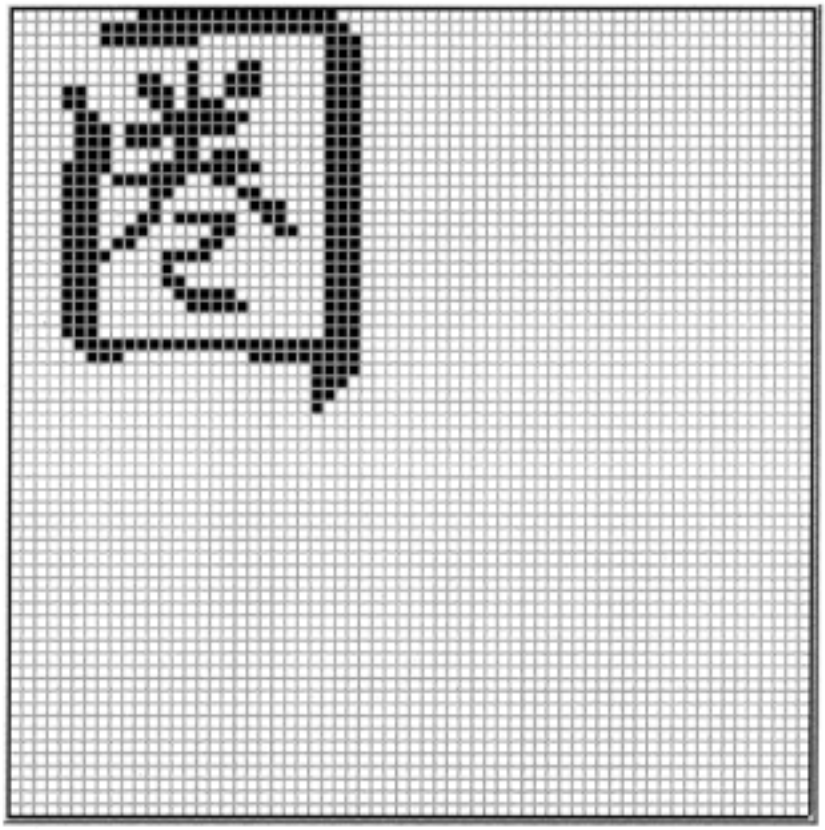


F5H

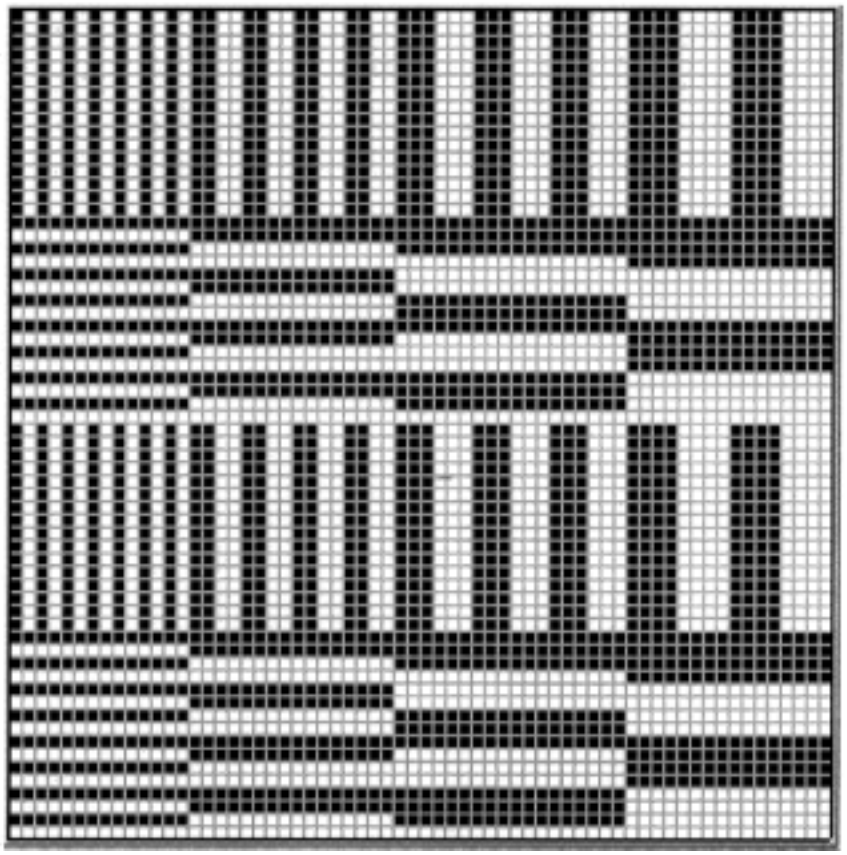


■ **(64x64) Character pattern table**

F6H



F7H



10.2. Table of error messages

Code (H)	Error message	Description	Remedial action
00	Panel ROM Unsetted	The PC card has not been inserted.	Insert the PC card correctly.
01	Prog No Disabled	The number of the program which was input turns out to have been set to "Disable" when direct display or a program was executed.	Input the number of the program which is set to "Enable."
02	DotClk over	DotClock in the horizontal timing data is outside the specified range.	Check the setting range.
03	Hfp over	The front porch in the horizontal timing data is outside the specified range.	Check the setting range. (Hperiod ≥ Hsync + Hbackp + Hdisp)
05	HD over	HDstart + HDwidth in the horizontal timing data is outside the specified range.	Check the setting range. (Hperiod ≥ HDstart + HDwidth)
07	Hperiod over	HPeriod in the horizontal timing data is outside the specified range.	Check the setting range.
08	Hdisp over	Hdisp in the horizontal timing data is outside the specified range.	Check the setting range.
09	Hsync over	Hsync in the horizontal timing data is outside the specified range.	Check the setting range.
0A	Hbp over	Hbackp in the horizontal timing data is outside the specified range.	Check the setting range.
0B	Hblank over	The blanking period in the horizontal timing data is outside the specified range.	Check the setting range.
0C	Hfreq over	The horizontal frequency in the horizontal timing data is outside the specified range.	Check the setting range.
0D	H-TIM data NG	Error other than those described above in the horizontal timing data.	
10	OUTPUT data error	Error in the output condition data.	Check the data.
11	CHR data error	Error in the character pattern data.	Check the data.
12	CROSS data error	Error in the crosshatch pattern data.	Check the data.
13	DOTS data error	Error in the dot pattern data.	Check the data.
14	CRCL data error	Error in the circle pattern data.	Check the data.
15	BRST data error	Error in the burst pattern data.	Check the data.
16	WIND data error	Error in the window pattern data.	Check the data.
17	COLBAR data error	Error in the color bar pattern data.	Check the data.
18	PARAMETER error	Error in a parameter in the terminal mode.	Check the data.
19	DATA error	Error in the data in the terminal mode.	Check the data.
1A	SYNC data error	The sync signal has not been set.	Set the sync signal.
1E	COMM. Timeout	Time-out has occurred in the data during communication in the terminal mode.	
1F	Undef Command	An undefined command was received in the terminal mode.	
20	VSync Timeout	Time-out has occurred during V sync interrupt wait.	
21	Prog-NO. error	Error in the program number.	Check the program number.
22	Group-NO. error	Error in the group number.	Check the group number.
23	User-CHR code error	Error in a user character code.	Check the user character code.

Code (H)	Error message	Description	Remedial action
24	EEPROM write error	An EEPROM write error has occurred.	
26	M-Card Access error	A PC card write error has occurred.	
28	M-Card Not Set	The PC card has not been installed.	Install the PC card.
29	M-Card UnFormatedt	The PC card is not formatted.	Format the PC card on the personal computer which can use the card.
2A	M-Card Full	There is no free space on the PC card.	
2B	OPT PTN No error	Error in the optional pattern number.	Check the number of the optional pattern.
2C	OPT PTN FAT error	Error in user-generated optional pattern FAT.	
2D	OPT PTN Not Registed	No user-generated optional patterns have been registered.	
2E	BMP data No error	Error in the image data number.	Check the number of the image data.
30	BMP data Not Registed	The image data has not been registered.	
32	Key Not Available	The function cannot be used because the key lock function is activated.	
33	CURSOR Not Selected	The cursor pattern has not been selected (when CurTool is used).	
34	OPT-0E (DDC) Disabled	The DDC optional pattern (#0E) is invalid.	
35	Flash ROM write error	A flash ROM write error has occurred.	
38	GRAY data error	Error in the gray scale pattern data.	Check the data.
39	OPT-PTN data error	Error in the optional pattern data.	Check the data.
3B	CURSOR data error	Error in cursor pattern data.	Check the data.
3C	PrgName data error	Error in the program name data.	Check the data.
3D	GCOLOR data error	Error in the graphic color data.	Check the data.
3E	ACTION data error	Error in the action data.	Check the data.
40	Vtotal over	Vtotal in the vertical timing data is outside the specified range.	Check the setting range.
41	Vdisp over	Vdisp in the vertical timing data is outside the specified range.	Check the setting range.
42	Vsync over	Vsync in the vertical timing data is outside the specified range.	Check the setting range.
43	Vbp over	Vbackp in the vertical timing data is outside the specified range	Check the setting range.
44	Vfp over	The front porch in the vertical timing data is outside the specified range.	Check the setting range. (Vtotal ≥ Vsync + Vbackp + Vdisp)
45	Vblank over	The blanking period in the vertical timing data is outside the specified range.	Check the setting range.
46	Vfreq over	The vertical frequency in the vertical timing data is outside the specified range.	Check the setting range.
47	VD over	VDstart + VDline in the vertical timing data is outside the specified range.	Check the setting range. (Vtotal ≥ VDstart + VDline)
48	EQPfp over	EQPfp in the vertical timing data is outside the specified range.	Check the setting range.

Code (H)	Error message	Description	Remedial action
49	EQPbp over	EQPbp in the vertical timing data is outside the specified range.	
4A	V-TIM data NG	Error other than those described above in the vertical timing data.	
4B	DDC1 Timeout	A timeout has occurred in DDC1.	
4C	DDC1 ACK error	ACK was not received in DDC1.	
4D	EDIDD Tim error	A response was not received in EDID.	
4E	DDC2 ACK error	ACK was not received in DDC2.	
60 to 62	File system err	Reserved	
63	Not free area	There is no free space on the PC card where data can be copied.	Delete some files on the PC card.
64	DMA Error	An error occurred during pattern output.	A failure may have occurred. Contact the manufacturer.
65	Data Not Registed	An attempt was made to copy PC card data but the copy source file was not found.	
66	Bideo Bord Busy	An error occurred on the video output board.	A failure may have occurred. Contact the manufacturer.

The following errors may occur when user-generated optional patterns are executed.			
81	OPT-Prog. not Exist	The user-generated optional pattern does not exist.	
82	Variables Stack Err	Variable stack error.	
83	Register Stack Err	Register stack error.	
84	Call Stack Error	Function stack error.	
85	Illegal Instruction	Illegal instruction code.	
86	Divide by Zero	An attempt was made to divide a number by zero.	
87	Math Error	An error has occurred in a floating decimal point calculation.	

10.3. Concerning the video memories and LUTs

The figure below shows the configuration of the video memories and LUTs in the VG-848.

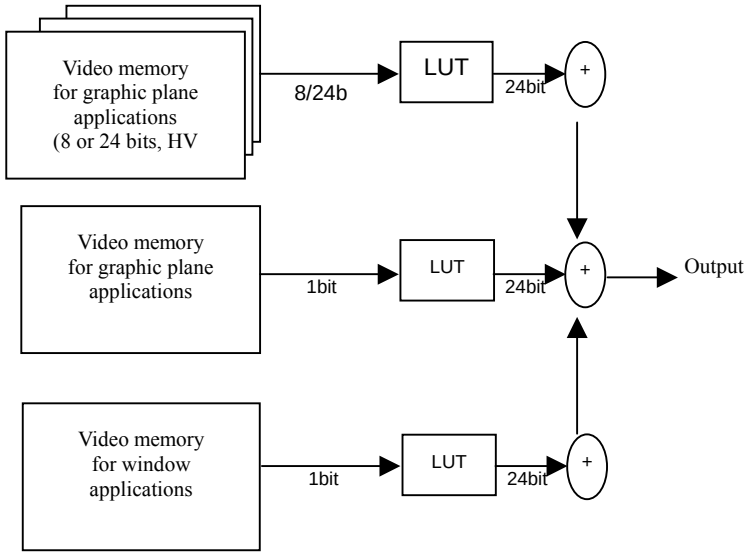


Fig. 10.3.1 Configuration

Table 10.3.1 Details of configuration

VRAM	PATTERN	General description
Video memory for graphic plane applications	Color bar, optional pattern and image data display	This normally operates as a 24-bit full-color VRAM. When color bars or optional patterns are displayed, it operates as an 8-bit VRAM or H/V mode VRAM.
Video memory for graphic plane applications	CHARA, CROSS, DOTS, CIRCLE, +, [ ], X, CURSOR, BURST, NAME, COLOR, GRAY, image data display.	This VRAM is used for the 1-bit drawing of characters, circles, etc.
Video memory for window applications	WINDOW	This VRAM is used exclusively for window patterns.

Point

The priority for the output is Window followed by Character, Graphic Plane. The color which is output in areas of overlap is determined by this priority position.

10.4. Connector pin layouts

10.4.1. Analog D-SUB Connector

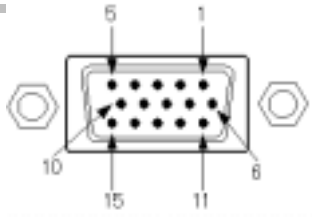


Fig.10.4.1 Pin layout

Table 10.4.1 Pin numbers

Pin No.	Signal	Pin No.	Signal
1	R	9	+5V(DDC power supply)
2	G	10	GND
3	B	11	GND
4	NC	12	DDC DATA
5	NC	13	HS
6	GND(R)	14	VS
7	GND(G)	15	DDC CLK
8	GND(B)		

* Refer to “10.5.3 About DDC power supply” about DDC power supply.

10.4.2. DVI digital serial output connector

Connector: Morex DVI-I (74320-1000), 24 pins + 5 pins (analog)
DVI-D (74320-4000), 24 pins

Output:: Panal link

■ Pin layout

Connector pin	Input/output signal	Connector pin	Input/output signal
1	TMDS DATA2-	16	SENSE
2	TMDS DATA2+	17	TMDS DATA0-
3	TMDS DATA2/4 G	18	TMDS DATA0+
4	TMDS DATA4-	19	TMDS DATA0/5 G
5	TMDS DATA4+	20	TMDS DATA5-
6	DDC CLK	21	TMDS DATA5+
7	DDC DATA	22	TMDS CLK G
8	Analog Vsync	23	TMDS CLK+
9	TMDS DATA1-	24	TMDS CLK-
10	TMDS DATA1+	C1	Analog Red
11	TMDS DATA1/3 G	C2	TMDS CLK-
12	TMDS DATA3-	C3	Analog Blue
13	TMDS DATA3+	C4	Analog Horizontal Sync
14	+5V	C5	Analog Ground (analog R,G,B return)
15	Ground		

■ Layout of pins as seen from panel

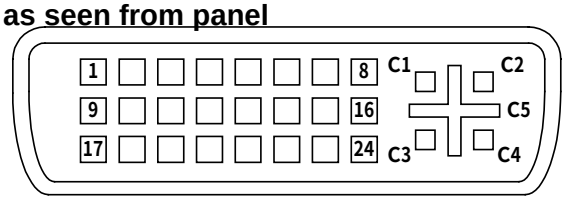


Fig. 10.4.2 Pin layout

Point

Clock delay settings cannot be performed with the PANEL LINK output.

The 1:1 Panel Link data is output from a single connector. Only EVEN data is output with the 1:2 Panel Link.
When the DVI-I (74320-1000) connector is used, no analog signals are output, and analog pin C5 is connected to ground.
The DVI-D (74320-4000) connector does not have the C1 to C5 pins shown in the above figure.
The +5 pin (pin 14) has a maximum current of 0.5A.
* Refer to “10.5.3 About DDC power supply” about DDC power supply.

10.4.3. D5 connector

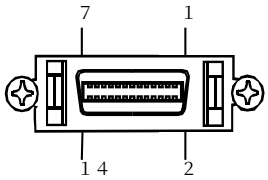


Fig. 10.4.3 Pin layout

Table 10.4.2 Pin numbers

Pin No.	Signal	Pin No.	Signal
1	Y	8	Line 1
2	GND (I)	9	Line 2
3	Pb	10	NC
4	GND (Pb)	11	Line 3
5	Pr	12	NC
6	GND (Pr)	13	NC
7	NC	14	NC

10.4.4. Y/C (S) connector

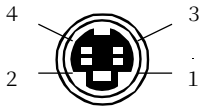


Fig. 10.4.4 Pin layout

Table 10.4.3 Pin numbers

Pin No.	Signal
1	GND
2	GND
3	Y
4	C

10.4.5. Remote (D-Sub 25-pin female) connector

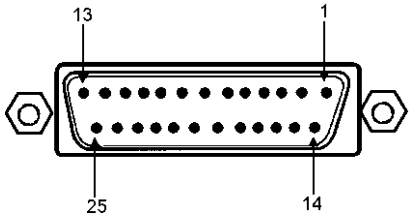


Fig. 10.4.5 Pin layout

Table 10.4.4 Pin numbers

Pin No.	I/O*Note 1	Signal	Pin No.	I/O	
1	I	KX7	14	I	KX6
2	O	KY2	15	O	KY3
3	O	KY4	16	O	KY1
4	O	KY5	17	I	KX4
5	I	KX5	18	O	KY0
6	I	KX3	19	I	KX2
7	I	KX1	20	I	KX0
8	-	GND	21	-	GND
9	O	RMT_RST*Note 2	22	O	RMT_CLK*Note 2
10	O	RMT_LAT*Note 2	23	O	+5V
11	-	GND	24	-	GND
12	O	RMT_DIN*Note 2	25	O	+5V
13	O	RMT_EN*Note 2			

* Note 1 : "I" or "O" is as seen from the VG-848.
* Note 2 : The control signals of these pins are used by Astrodesign. Under no circumstances must any connections be made to these pins.

As shown in the figures below, the signals and remote control box (optional accessory) key contacts are arranged in the form of a matrix.

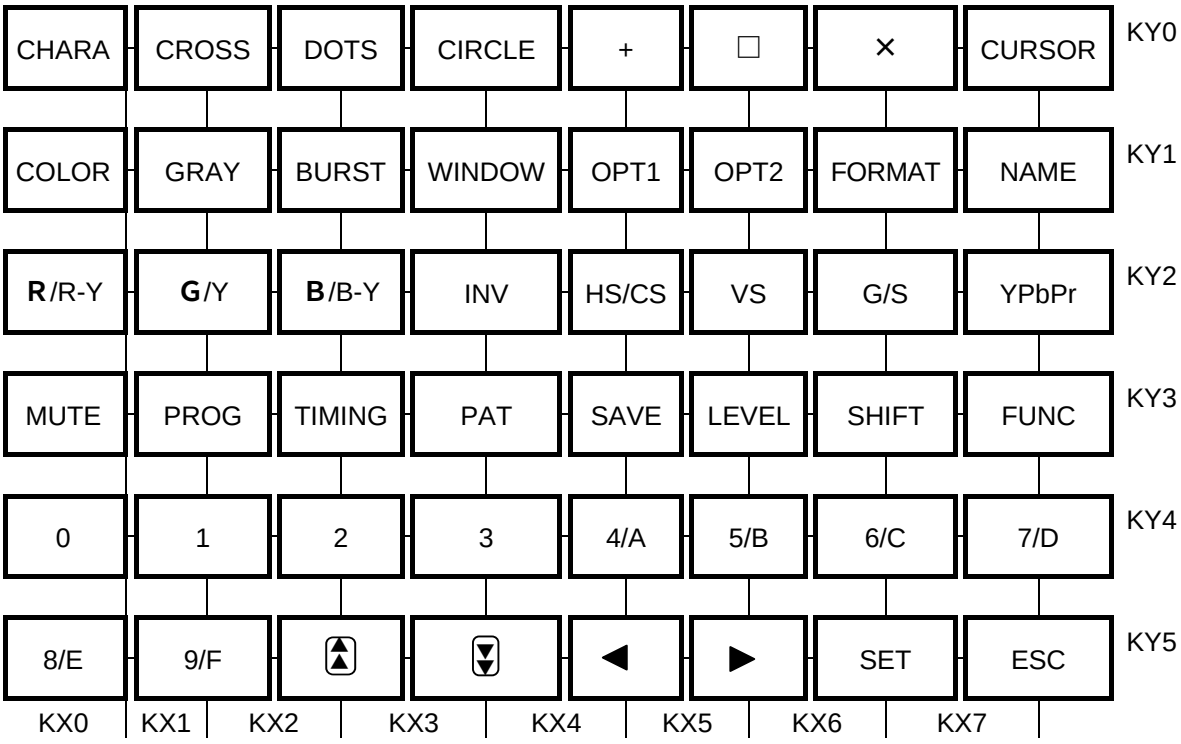


Fig. 10.4.6 RB-1848 key matrix

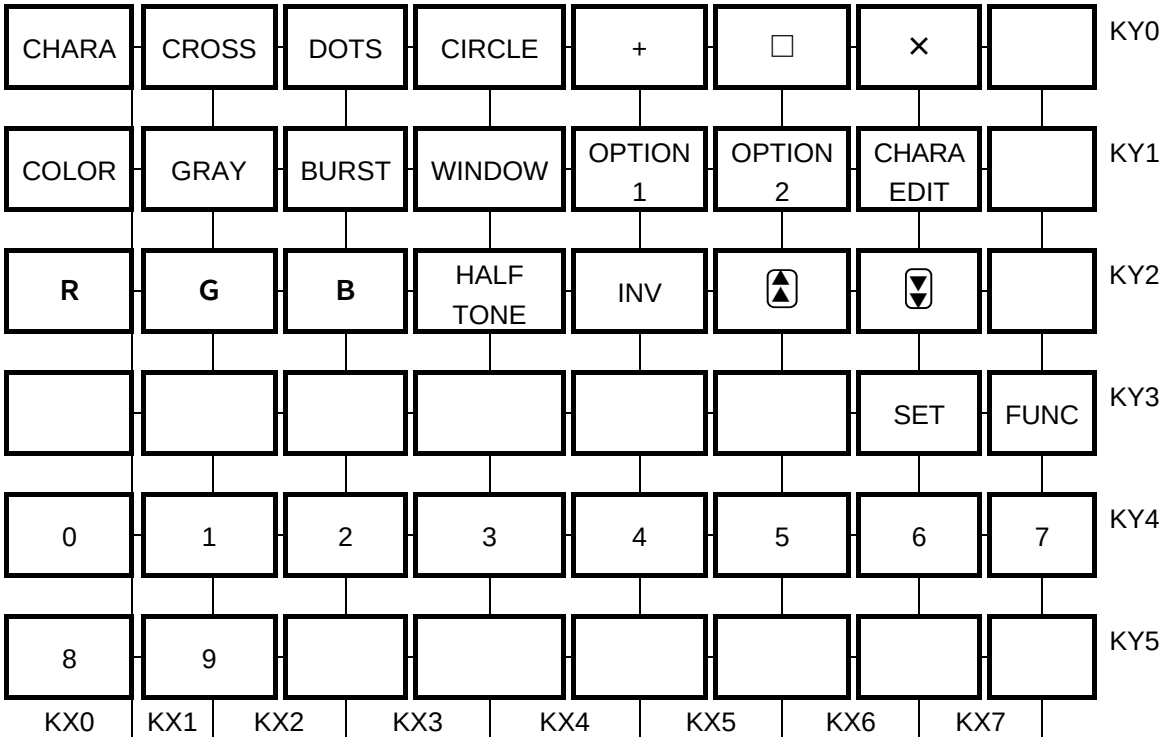


Fig. 10.4.7 RB-614C key matrix

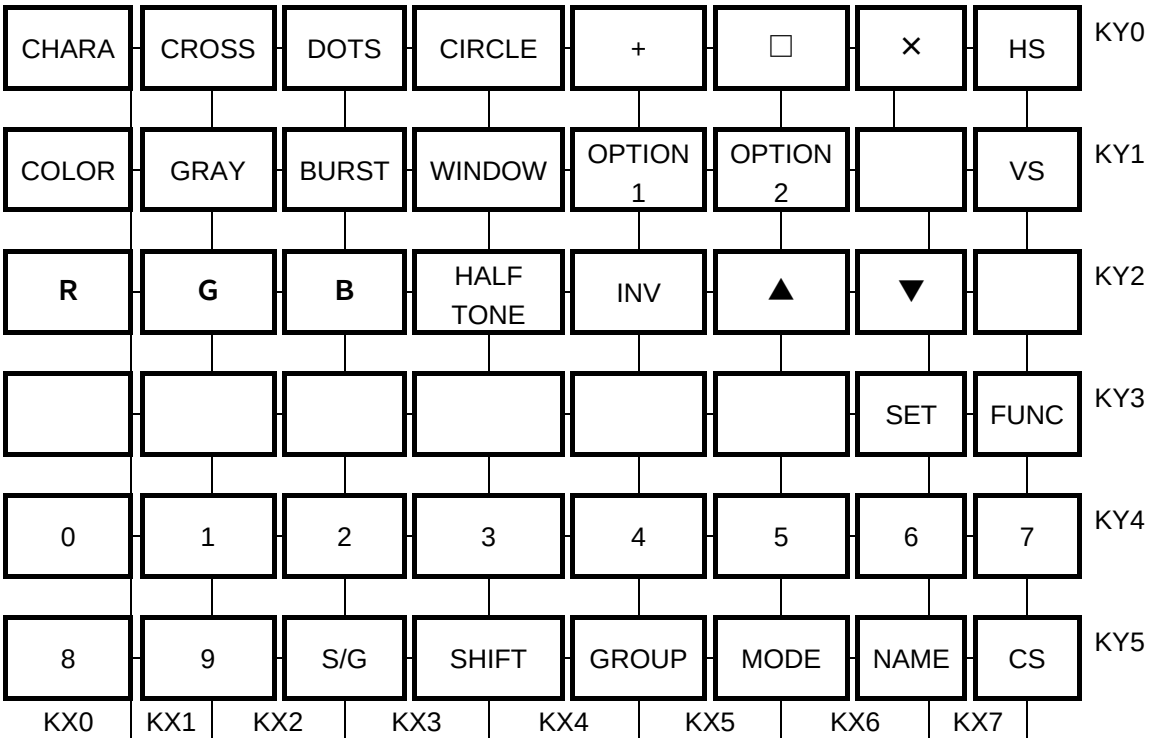


Fig. 10.4.8 RB-649 key matrix

10.4.6. RS-232C (D-Sub 9-pin female) connector

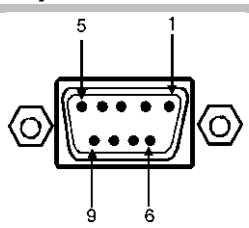


Fig. 10.4.9 Pin layout

Table 10.4.5 Pin numbers

Pin No.	I/O	Signal
1	-	NC
2	O	TXD (transmitted data)
3	I	RXD (received data)
4	-	Shorted with pin 6
5	-	FG (frame ground)
6	-	Shorted with pin 4
7	I	CTS (clear to send)
8	O	RTS (request to send)
9	-	NC

10.5. VG-848 specifications

10.5.1. Specifications

Dot clock frequency	Analog	5.00 to to 300.00MHz
	Digital	Serial output (Panel Link) Single link 25 to 165MHz Dual link 50 to 300MHz
Horizontal frequency		10 to 300 kHz, max. 8192 dots
Number of vertical scanning lines		Max. 8192 lines
Video memory		4096 dots x 4096 dots
Video signal output level		0.30 to 1.20V
Sync signal output level (HS, CS, VS)		More than 2V (75 ohms)
Serration pulse (SERRATION)		OFF or 1H selectable
Composite video sync signals		ON/OFF selectable separately for R, G and B
Scanning		Non-interlaced, interlace & video
Analog output connectors (BNC)		RGB, HS, VS, CS
Fine adjustment of analog output levels		Offset level (RGB coupled), video level (separate for R, G and B)
DVI output		DVI 1.0
Output control	Analog	RGB, ON/OFF and inverse ON/OFF and negative/positive for HS, VS, CS Negative/positive for CLK
Audio output connectors (RCA x 2 channels)		Output frequency: 100 to 20000 Hz (in 100 Hz increments) Output level: 0 to 2000mV (in 50mV increments)
External interface		Remote connector (25-pin)
		RS-232C (9-pin)
		LAN (10/100BaseTX)

10.5.2. Ratings

Supply voltage	AC100 to 120V, AC200 to 240V
Power line frequency	50Hz/60Hz
Power consumption	70VA MAX
Dimensions	430 (W)×88 (H)×430 (D)mm (excluding protrusions)
Weight	Approx. 10 kg
Operating temperature	5 to 40°C
Storage temperature	-10 to 60°C
Humidity	30 to 85%, RH (no condensation)

10.5.3. About DDC Power supply

DDC power supply (+5V) is provided for Analog Dsub output and DVI output of VG-849.
The supply current of DDC power supply is 0.5A max.

The DDC power supply outputs as below.

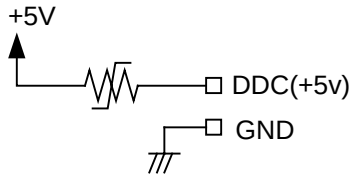


Fig.10.5.1 DDC power supply circuit

Caution

- Although the DDC power supply is equipped with over-current protection element, do not use the current value exceeding the standard.
- Do not provide the current from the connecting side. If so, VG-849 and the connecting apparatus may break.

10.6. Upgrading the firmware version

10.6.1. Preparing to upgrade the firmware version

The version of the firmware in the VG-849 can be upgraded by following one of the two procedures described below.

Provide the items listed below according to the procedure which will be followed.

Implement the preparations which are set forth below according to the method which will be used to supply the data.

■ **When upgrading the firmware version by decompressing compressed files**

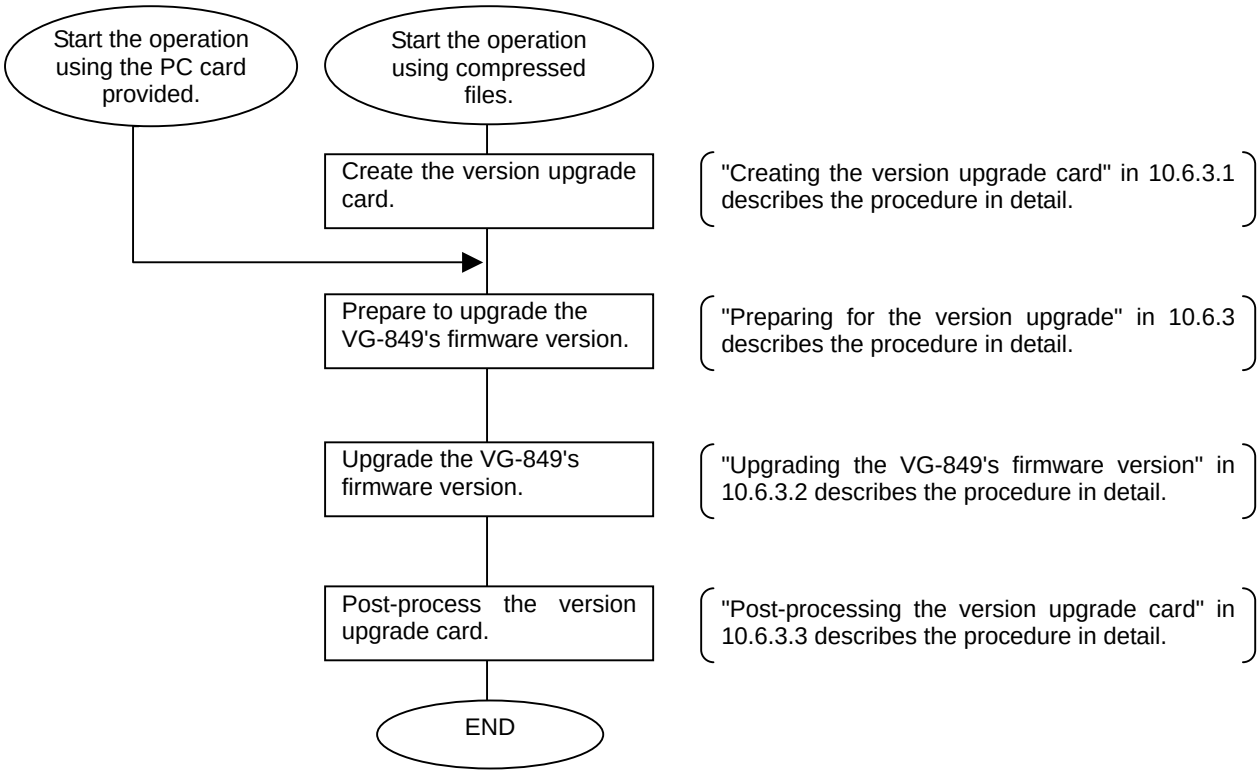
- ATA card or CompactFlash (CF) card: 1 pc
- PC card adapter when using CompactFlash card: 1 pc
- PC running on Windows with a PC card slot (which can read/write CompactFlash (CF) card data)

■ **When using the firmware version upgrade card provided ahead of time**

- There are no items that need to be provided.

10.6.2. Upgrading proSTANDAAD

The flowchart shown below gives an outline of the steps involved in upgrading the firmware version.



Flow for upgrading the firmware version

10.6.3. Detailed procedure

■ Creating the version upgrade card

Point

These steps may be skipped if the upgrade version files have been supplied on the PC card.

(1) Insert the PC card into the PC.

(2) Use the PC provided to decompress the compressed files.

The compressed files supplied can usually be decompressed using a decompression program which supports the LHZ/ZIP format.

For reference, examples of easily obtainable programs for compressing and decompressing data files are given below.

Lhasa (freeware for Windows which supports the LZH/ZIP format and which only decompresses files)

Lhaplus (freeware for Windows which supports over 20 types of compression formats and which compresses and decompresses files)

(3) Copy the decompressed files into a root folder on the PC card.

■ Upgrading the VG-848's firmware version

(1) Set the power of the VG-848 to OFF.

(2) Insert the version upgrade card into the VG-848.

(3) Set the power of the VG-848 to ON.

(4) About three minutes later, the VG-848 will automatically update the firmware version using the data on the PC card.

While the version is being upgraded, the updating status appears on the LCD display.

```
Versionup ver.x.xx===
xxxxxxxxxxxxx
```

Fig. 10.6.1 LCD display when version up is operated.

Caution

Follow the precautions below while the version is being upgraded.
Do not perform either of the operations below by mistake since the internal firmware may be destroyed and the VG-848 may malfunction.
- Turning off the power
- Removing the PC card

(5) Upon completion of the upgrading, the "Versionup complete." message appears on the display. The buzzer then sounds, and the "Please power off" message appears.

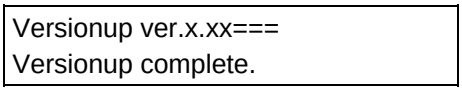


Fig. 10.6.2 Version up complete 1

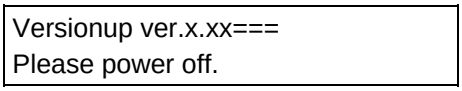


Fig. 10.6.3 Version up complete 2

(6) Set the power of the VG-849 to OFF.

(7) Remove the PC card.

Caution

After turning off the power, be absolutely sure to remove the PC card. If it is not removed, the version upgrading will start again when the power is next turned on.

If the power has been turned on with the PC card left inserted by mistake, do not turn off the power or remove the card until the "Versionup complete." message in (5) appears on the display.

■ Post-processing the version upgrade card

(1) Delete the files which were copied when the version upgrade card was created from the data on the PC card used for upgrading the firmware version. Refer to "5.5. Copying program data (PC card copy)" .

Point

Once the files are deleted, the card can be used as a regular PC card.

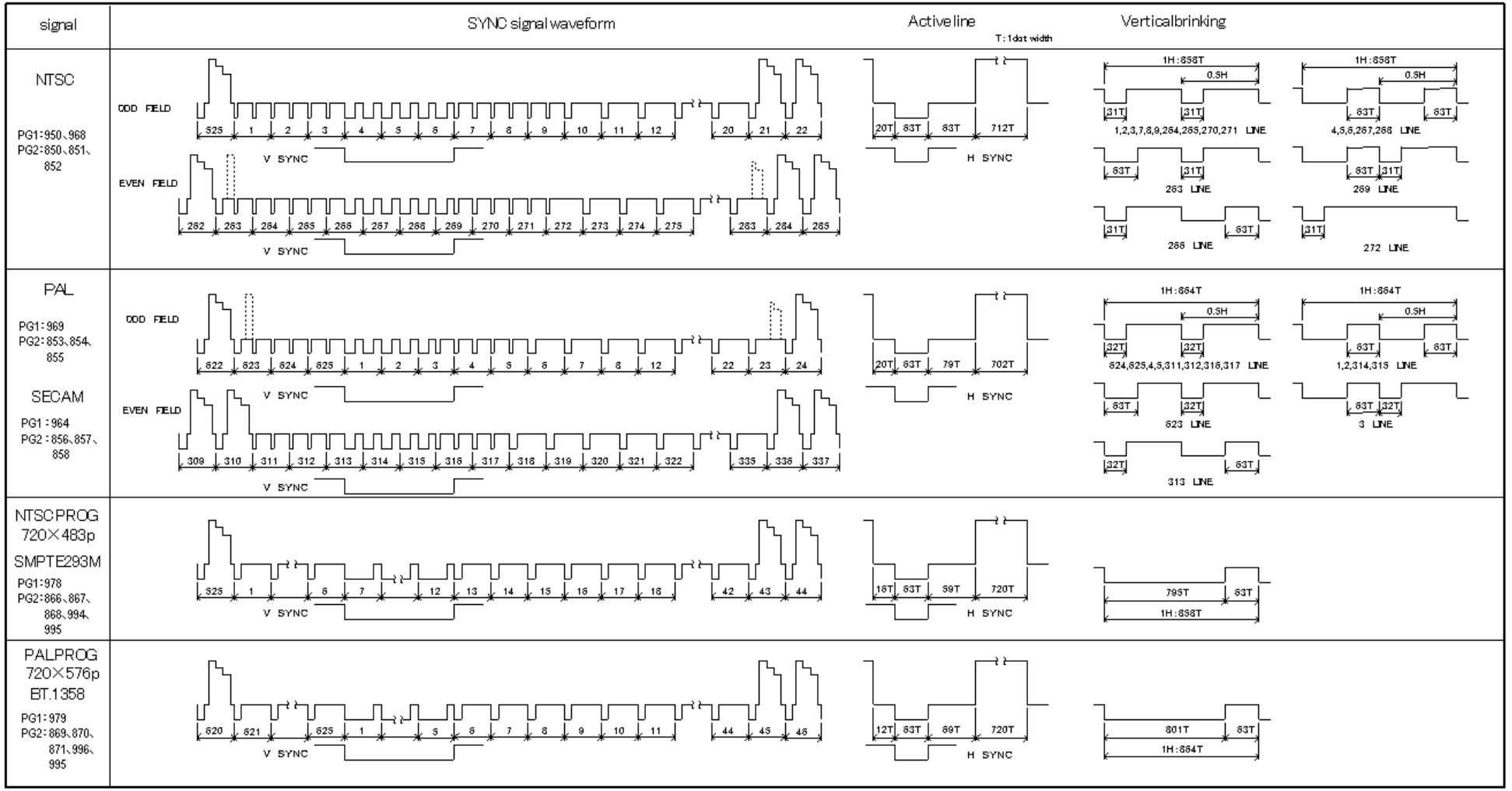
10.7. Standard signal timing specifications

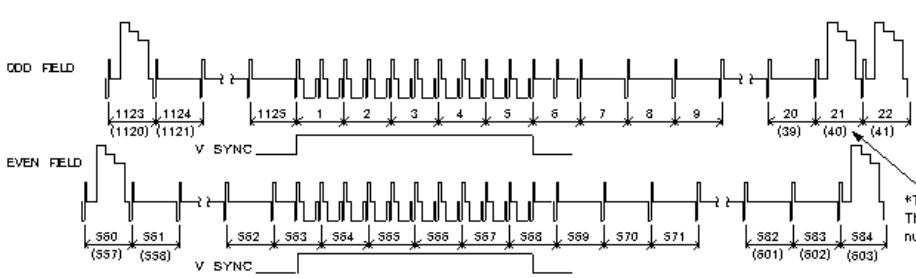
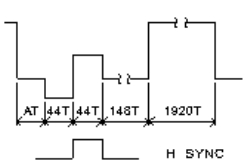
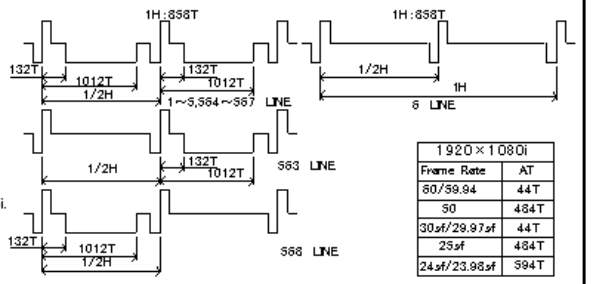
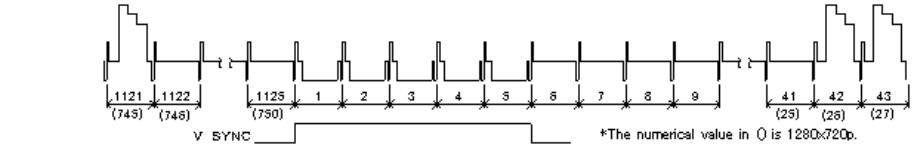
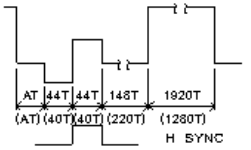
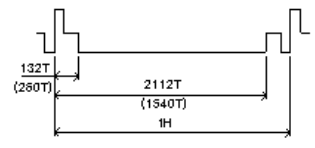
■ Table of internal program rated timings

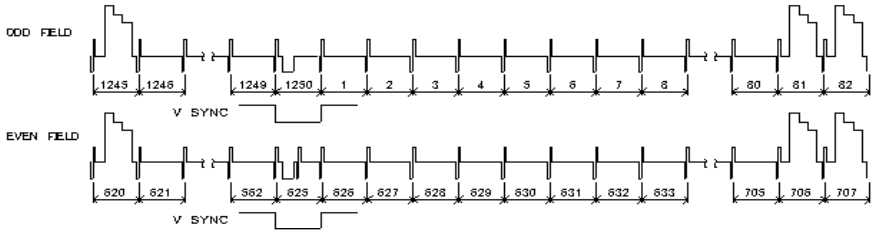
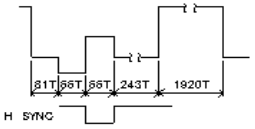
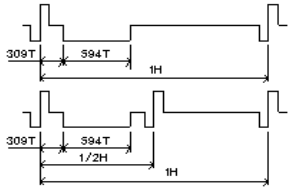
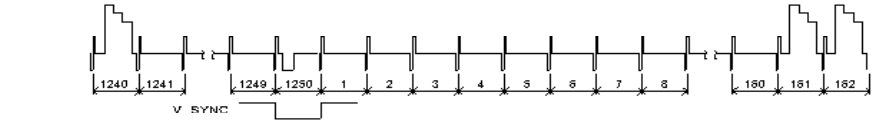
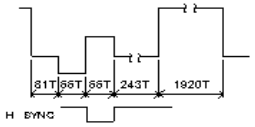
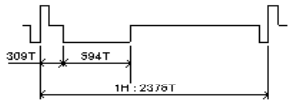
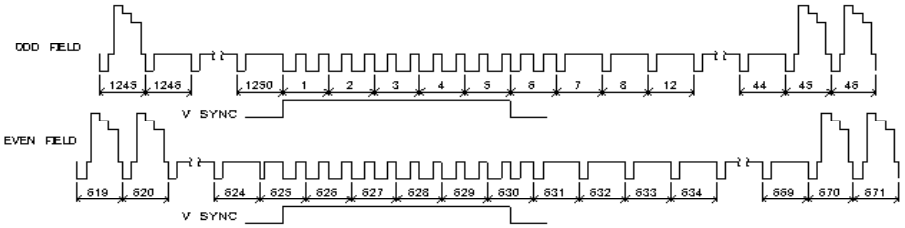
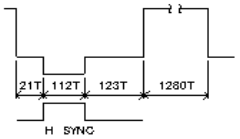
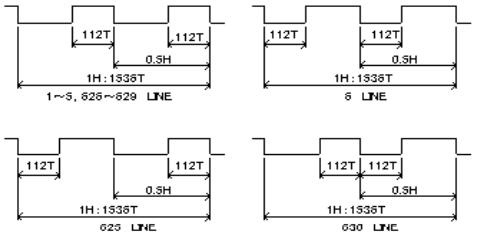
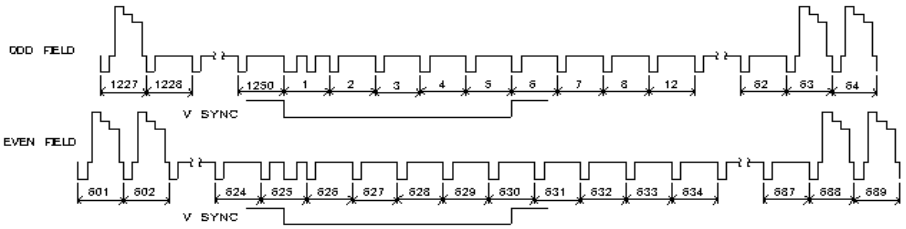
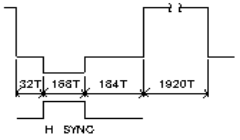
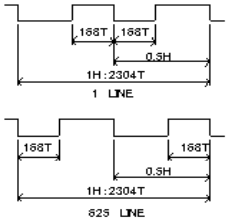
Program No.	Format	Reference standard	No. of effective scanning lines (total no. of scanning lines)	No. of horizontal samples (total no. of horizontal samples)	Aspect ratio	V rate		D connector line (V)			Subcarrier	SETUP
						Fields	Frames	1	2	3		
PG1 950,968 PG2 850,851,852	NTSC (NTSC-3.58/JAPAN)	NTSC	484(524)	712(858)	4:3	59.94	29.97	0	0	0	3.58 3.5795	No
PG1 969 PG2 853,854,855	PAL (B/D/G/H/I/K)	PAL	574(624)		4:3	50	25	—	—		4.43 4.4336	No
PG1 964 PG2 922,923,932	SECAM	SECAM	574(624)	702(864)	4:3	50	25	0	0	0	for=4.4063 fob=4.4250	No
PG1 978 PG2 866,867,868,994,995	720x483 NTSC PROG	293M	483(525)	720(858)	16:9		60		5	5		
PG1 979 PG2 869,870,871,996,997	720x576 PAL PROG.	BT.1358	576(625)	720(864)	16:9		50	0	0	5		
PG1 970、PG2 873	1080/60p	274M	1080(1125)	1920(2200)	16:9		60	5	5	5		
PG1 971、PG2 874							59.94					
PG1 972、PG2 881	1080/60i	274M	1080(1125)	1920(2200)	16:9	60	30	5	0	5		
PG1 973、PG2 882						59.94	29.97					
PG1 974、PG2 898	1035/60i	BTA S-001A		1920(2200)	16:9	60	30	5	0	5		
PG1 975、PG2 899						59.94	29.97					
PG1 976、PG2 890	720/60p	296M	720(750)	1280(1650)	16:9		60	2.2	5	5		
PG1 977、PG2 891							59.94					
PG1 994、PG2 924	NTSC-M	NTSC	484(524)	712(858)	4:3	59.94	29.97	0	0	0	3.5795	Yes
PG2 925	NTSC-443	NTSC	484(524)	712(858)	4:3	59.94	29.97	0	0	0	4.4336	Yes
PG2 926	PAL-M	PAL	574(624)	702(864)	4:3	59.94	29.97	—	—	—	3.5796	Yes
PG2 927	PAL-60	PAL	574(624)	702(864)	4:3	59.94	29.97	—	—	—	4.4336	No
PG2 928	PAL-N	PAL	574(624)	702(864)	4:3	50	25	—	—	—	4.4336	Yes
PG2 929	PAL-Nc	PAL	574(624)	702(864)	4:3	50	25	—	—	—	3.5821	No

Line 1 (no. of scanning lines) 5V: 1125; 2.2V: 750; 0V: 525
Line 2 (interlaced or progressive scanning) 5V: 60 progressive; 2.2V: other than 60; 0V: 60 interlaced
Line 3 (aspect ratio) 5V: 16:9; 2.2: 4:3 letter-box; 0V: 4:3
* When it is not supported, "-" is shown. The output voltage is 0V.
for, fob: Identification signal center frequencies

■ Standard signal timing waveform

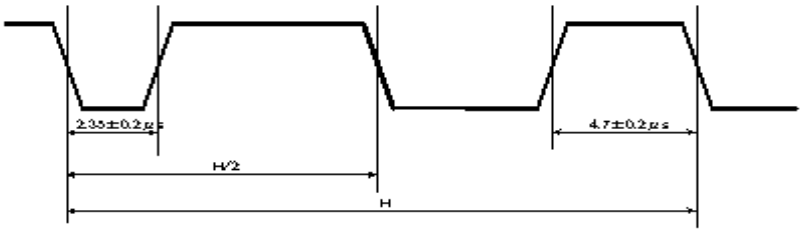


signal	SYNC signal waveform	Active line	Vertical brinking
1920×1080i (1920×1035i) SMPTE274M (BTAS-001) (1080i) PG1: 972、973 PG2: 881、882、883、 (1035i) PG1: 974、975 PG2: 898、899			 1920×1080i Frame Rate / AT 60/59.94 / 44T 50 / 484T 30sf/29.97sf / 44T 25sf / 484T 24sf/23.98sf / 594T
1920×1080p (1280×720p) SMPTE274M (1080p) PG1: 970、971 PG2: 873、874 (720p) PG1: 976、977 PG2: 890、891			 1920×1080p Frame Rate / AT 60/59.94 / 44T 50 / 484T 30/29.97 / 44T 25 / 484T 24/23.98 / 594T 1280×720p Frame Rate / (AT) 60/59.94 / 70T 50 / 400T 30/29.97 / 1720T 25 / 2380T 24/23.98 / 2545T

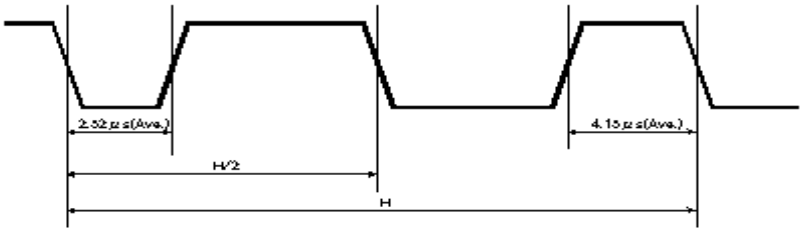
signal	SYNC signal waveform	Active line T:1dot width	Vertical brinking
1920×1080i SMPTE295M China PG2:900			
1920×1080p SMPTE295M (Only an analogoutput) PG2:901			
1280×1152i Australian PG2:902			
1920×1080i (1250) Australian PG2:903			

■ Concerning the vertical blanking of the VBS, Y/C output (PAL/SECAM)

Rating and rating reference values



VG-848



Vertical (field) blanking period

The vertical blanking timing of the VBS and Y/C output differs from the rating as shown above.

10.8. PC card registration method

10.8.1. Registration method

The registration method differs from data contents when registering to PC card.

■ Program data

- When the edited data is registered into a PC card, the folder named “prg” is made. The data exists in that folder.
- The data file is made with the name of “prg001.vgd”, “prg002.vgd” and “prg003.vgd” ….
- The extended data file named “prgext001.vgd” is made in addition to the file “prg001.vgd” only when using VG-848Ver1.29 or subsequent ones and VG-849.

■ Character data

- When the edited data is registered into a PC card, the file is made as it is.
- The data file is made with the name of “uchardata0E0.vgd”, “uchardata0E1.vgd” and “uchardata0E2.vgd”…

■ Group data

- When the edited data is registered into a PC card, the file is made as it is.
- The data file is made with the name of “group001.vgd”, “group002.vgd” and “group003.vgd”…

■ Auto display data

- When the edited data is registered into a PC card, the file is made as it is.
- The data file is made with the name of “autodisp.vgd”.

■ VBM data

- When the edited data is registered into a PC card, the folder named “bmp” is made. The data exists in that folder.
- The data file is made with the name of “bitmap001.vgd”, “bitmap002.vgd” and “bitmap003.vgd”…
- As one data file is made, the name file such as “bitmapname001.vgd” which is a pair of the data file is made.

■ Option pattern data

- When the edited data is registered into a PC card, the file is made as it is.
- The data file is made with the name of “opt001.vgd”, “opt002.vgd” and “opt003.vgd”…
- As one data file is made, the name file such as “optname001.vgd” which is a pair of the data file is made.
- When registering the data file, opt-pth code starts from 40, however, when generating the file, the code from 0. For example, if opt-pth code 40 is registered, the file “opt000.vgd” is made. Since the display uses hex decimal way, if the code 50 is registered, the file “opt016.vgd” is made.

10.8.2. Example of PC card registration contents

PC card

```
├ bmp (folder)                 : VBM data folder
│    ├ bitmap001.vgd           : VBM data
│    ├ bitmap002.vgd           : VBM data
│    ├ bitmap003.vgd           : VBM data
│    ├ bitmapname001.vgd       : VBM Name data
│    ├ bitmapname002.vgd       : VBM Name data
│    └ bitmapname003.vgd       : VBM Name data
├ prg (folder)                 : Program data folder
│    ├ prg001.vgd              : Program data
│    ├ prg002.vgd              : Program data
│    ├ prg003.vgd              : Program data
│    ├ prgext001.vgd           : Extended program data *1
│    ├ prgext002.vgd           : Extended program data *1
│    └ prgext003.vgd           : Extended program data *1
├ autodisp.vgd                 : Auto display data
├ group001.vgd                 : Group data
├ group002.vgd                 : Group data
├ group003.vgd                 : Group data
├ opt001.vgd                   : Option pattern data
├ opt002.vgd                   : Option pattern data
├ opt003.vgd                   : Option pattern data
├ opt016.vgd                   : Option pattern data
├ optname001.vgd               : Option patter Name data
├ optname002.vgd               : Option patter Name data
├ optname003.vgd               : Option patter Name data
├ optname016.vgd               : Option patter Name data
├ uchardata0E0.vgd             : Character data
├ uchardata0E1.vgd             : Option patter Name data
└ uchardata0E2.vgd             : Option patter Name data
```

*1 VG-848Ver1.29 or subsequent ones and VG-849,VG-859.

10.8.3. How to delete the registered data

When deleting the registered data in a PC card, set the PC card into a PC, select the deleting file from the displayed file name, and press “DEL” key, or use the right click menu of the mouse and select “delete”.

10.8.4. How to copy the registered card data

When copying the registered data in a PC card, insert the PC card into a PC, select the copied file from the displayed file. Press “ctrl+c” and “ctrl+v” (copy and paste), or use right click menu and select “copy” → “paste”.

CAUTIONS

- An incorrectly collated manual or a manual with missing pages will be replaced.
-
-
- The contents of this manual are subject to change without prior notice due to improvements.
- The manufacturer will not be liable for any damage or trouble caused by the faulty connection or operation of this generator.
- All inquiries concerning this product should be addressed to your dealer or to the manufacturer at the contact numbers given below.
- The products and product names mentioned in this manual are the trademarks and registered trademarks of the companies concerned.

VG-848（RB-1848）Instruction Manual

Sales and Marketing Department

2-6-17 Haramachi, Meguro-ku, Tokyo 152-0011 Japan

PHONE: +81 3-5720-5834

FAX : +81 3-5720-6353

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