

**Video Signal Generator**  
**VG-823**  
**Instruction Manual**

**Part I**




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
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## FOREWORD

Thank you for purchasing the model VG-823 video signal generator.

This manual provides details on the operation and the precautions to be taken when using the VG-823. Since improper handling can lead to accidents, we recommend that you take the time to read through this manual before attempting to operate the VG-823: the information provided will ensure that you will operate the VG-823 properly.

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

## SAFETY PRECAUTIONS

### WARNING

#### CONCERNING THE POWER CORD

- ◆ Always take hold of the molded part of the plug when disconnecting the power cord.
- ◆ Do not use force to bend the power cord or bundle it with other cords for use. This may cause a fire.
- ◆ Do not place heavy objects on top of the power cord. This may damage the cord, causing a fire or electrical shock.

#### CONCERNING FOREIGN MATTER

- ◆ Do not spill liquids inside the generator or drop inflammable objects or metal parts onto it. Operating the generator under these conditions can cause a fire, electrical shock or malfunctioning.

### CAUTION

#### (1) Concerning the installation and operating locations

- ◆ Install the generator in a stable location.
- ◆ Choose an operating location which is as well-ventilated as possible. The ventilation holes on the sides and the fan are needed to prevent the interior temperature from rising. Do NOT block them since this can cause malfunctioning.

#### (2) Concerning impact

- ◆ This is a precision instrument and, as such, subjecting it to impact may cause malfunctioning. Take special care when moving the generator.

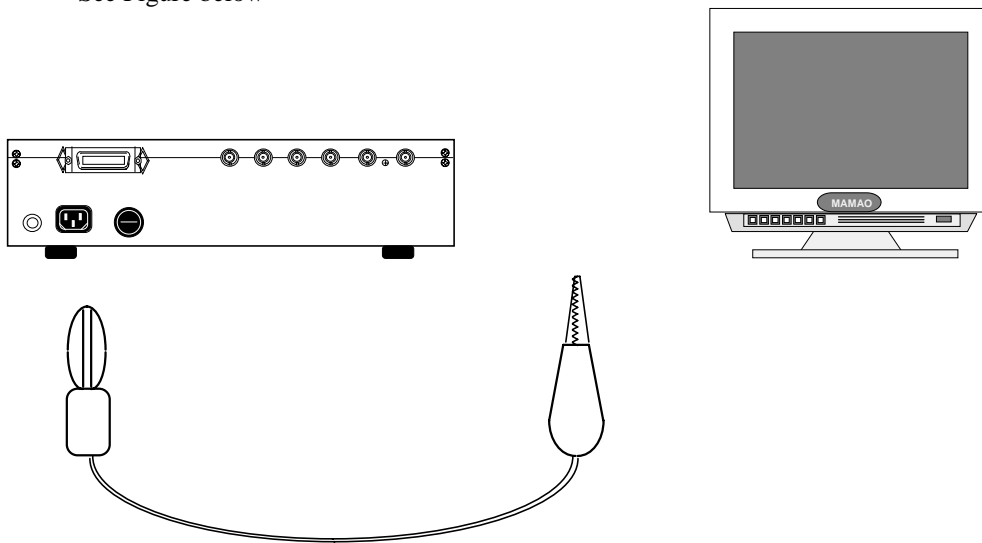
#### (3) Concerning the supply voltage

- ◆ A supply voltage ranging from 90V to 250V can be used with the VG-823.

#### (4) Before connecting the VG-823 to the display

Connect the frame grounds on both the VG-823 and display (using the accessory FG cable) before connecting the signal cables to the two units.

\*See Figure below



**Fig. 0-1**

Connect the banana plug on the cable to the frame ground of the VG-823, and connect the crocodile clip to the frame ground on the CRT. Connection between the frame grounds makes the output D/A converter and other extremely costly parts of the VG-823 less susceptible to damage. Taking this precaution is particularly important when the CRT is a newly developed model.

#### **(5) When disconnecting the VG-823 from the CRT**

First disconnect the cables from the BNC connectors (R/G/B and sync signals), and disconnect the frame ground last.

#### **(6) Handling the panel ROM**

Switching on the VG-823's power with the panel ROM installed must be performed using the POWER switch on the side panel. The panel ROM may be damaged if the power is turned on by plugging in the AC cord or by disconnecting this cord and then re-connecting it.

#### **(7) If problems arise in accuracy**

If any problems in accuracy should arise, keep the power supplied to the VG-823, leave it running for 10 to 15 minutes to allow the VG-823 to stabilize, and then try using it.

#### **(8) When trouble or malfunctioning occurs**

In the unlikely event that trouble or malfunctioning occurs first disconnect the power cord and contact your dealer or an Astrodesign sales representative (at 044-751-1011 in Japan).

# CHAPTER 1 INTRODUCTION

## 1-1 INTRODUCTION

The VG-823 is Astrodesign's latest video signal generator model which features a cost performance superior to that of the model VG-819 generator which has been in use as an industry standard. It supports the timings of 1600 x 1280 dots (horizontal frequency: 100 kHz), which is the maximum resolution of today's computer displays, and its setting accuracy in 1-dot increments enables video signals to be output reliably.

Since it is compatible with existing programmable video signal generators, the VG-823 can be put to use simply by plugging in the panel ROMs currently employed by the user.

By employing the generator with the dedicated remote control box (RB-649: option) which has been newly developed, program data can be edited and entered using on-screen menus. It can be used in an extremely wide spectrum of applications ranging from the development of video signal-related equipment technology to production lines and maintenance.

## 1-2 FEATURES

### (1) High cost performance

The unit's gate array design achieves a compact size, light weight, low cost and low power consumption despite its impressive dot clock frequency band of 5 to 250 MHz which is wider than that of the model VG-819. A setting accuracy in 1-dot increments and high performance are assured across the entire frequency band.

### (2) Data compatibility with other models

The unit allows the use of the panel ROMs whose data has been set and entered in other models in the existing VG series (VG-812, 813, 814, 815, 819, 823 and 829). The same output patterns (11 basic patterns and approx. 30 special patterns incorporated) as those used in the original VG unit are achieved.

### (3) On-screen menu entry function

Using the optional dedicated remote control box (RB-649), menus can be shown on the display of any of the timings, and program data can be edited and entered into panel ROMs. Data can also be entered into the panel ROMs using other optional products (RB-647 operation box and SP-8000 series program editing software).

### (4) Sync signal ON/OFF function

Using the optional dedicated remote control box (RB-649), the sync signals (HS, VS, CS, S/G) can be turned ON or OFF manually. This enables the simulation of power-saving functions complying with VESA and DPMS standards. (Switching is also possible by entering data into an existing panel ROM.)

### (5) Faster selection of pattern drawing

A high-speed CPU and other original circuit design features yield high-speed switching in order to reduce the time taken for pattern switching which is indispensable on production lines. The patterns can be switched in a single-touch action using the RB-649.

### (6) Graphic functions

Crosshatch, dot patterns, etc. can be drawn by sending graphic commands from an external computer via the RS-232C interface, and this enables the generator to be incorporated into automatic measuring systems.

### (7) Full support for a wide range of functions

- The keys on the dedicated remote control box (RB-649) come with LEDs for improved operating ease.
- Both the dedicated RB-649 and existing RB-614C remote control boxes are supported.



- In addition to the existing panel ROM (40 programs), a new EE-PROMs (160 programs) with a four times capacity.
- The RS-232C interface enables the VG generator to be controlled by an external computer.
- Auto display function
- Group display function
- 40 types of sample timing data incorporated



### 1-3-2 Rear panel

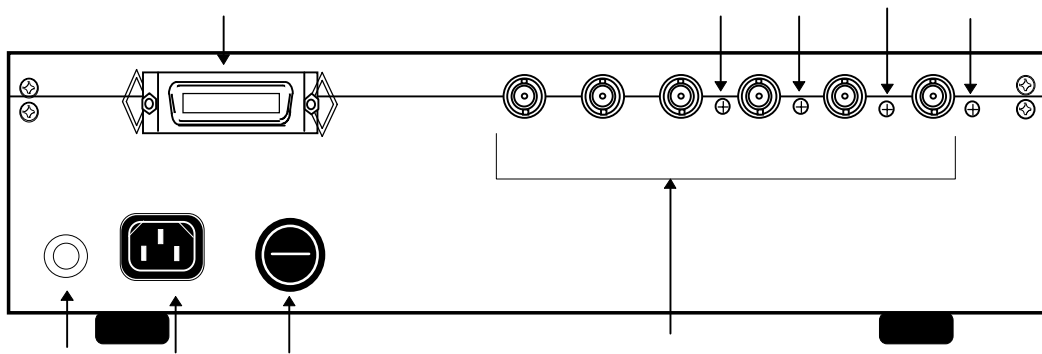


Fig. 1-2

**TTL output connector (57 series; 24-pin connector)**

For details on the connector pin layout, refer to Section 8-5.

**Analog output connectors (BNC)**

- |   |   |                    |    |   |                        |
|---|---|--------------------|----|---|------------------------|
| R | : | Red video signal   | HS | : | Horizontal sync signal |
| G | : | Green video signal | VS | : | Vertical sync signal   |
| B | : | Blue video signal  | CS | : | Composite sync signal  |

**Rear panel trimmer: Used to adjust the RGB output offset.**

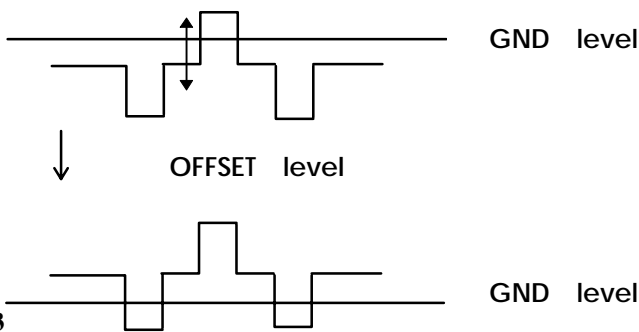


Fig. 1-3

**Rear panel trimmer: Used to adjust the B output level.**

**Rear panel trimmer: Used to adjust the G output level.**

**Rear panel trimmer: Used to adjust the R output level.**

Turning these trimmers causes the Vp-p output level indicated in Fig. 1-4 to change.

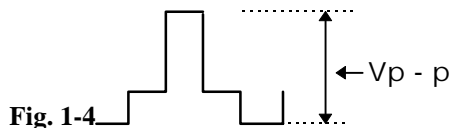


Fig. 1-4

**Frame ground (FG)**

This is connected to the frame ground of the unit which is connected with the VG-823.

**AC power socket**

Any voltage from 90V to 250V can be supplied to this socket.

**Fuse**

A 2A slow-acting fuse is used.

### 1-3-3 Right side panel

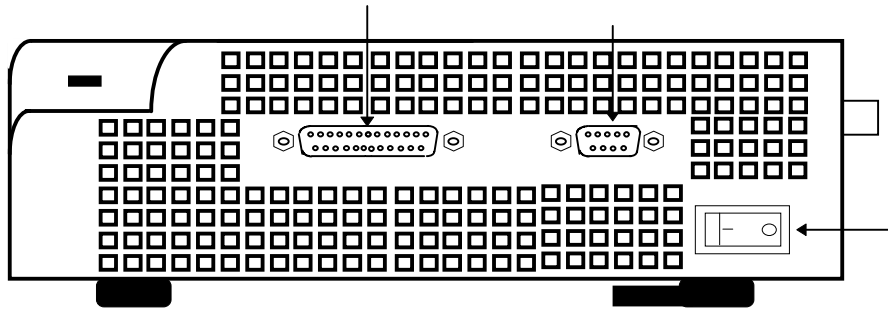


Fig. 1-5

#### **POWER switch**

#### **RS-232C connector (9-pin)**

This is used to control the VG-823 from an external computer (personal computer, etc.) or the optional operation box (RB-647). For details on the connector pin layout, refer to Section 8-5.

#### **Remote connector (25-pin)**

This connects the optional remote control box (RB-649, RB-614C) and enables the unit to be operated by remote control. For details on the connector pin layout, refer to Section 8-5.

**The POWER switch on the rear panel must be used to turn on the VG-823's power.**

**The panel ROM may be damaged if the power is turned on by plugging in the AC cord or by disconnecting this cord and then re-connecting it.**

## CHAPTER 2 PANEL ROMS

### 2-1 Workings of the panel ROM

#### (1) The VG-823 will not operate without the panel ROM.

The VG-823 operates on the basis of the program data entered in the panel ROM.

When the VG-823 is to be operated, install a panel ROM in which the data has already been entered.

(The panel ROM is not required when using the internal sample program data.)

#### (2) How to enter data into the panel ROM

Program data cannot be entered into the panel ROM with the model VG-823 alone.

However, it can be edited and entered by means of the on-screen menu system when the optional remote control box (RB-649) is used. Panel ROM data can also be prepared using other optional products (RB-647 operation box and SP-8000 series of program editing software).

Panel ROMs with data entered for applications involving existing models in the VG series (VG-812, 813, 814, 815, 819, 822 or 829) can be used in their original form. (Refer to the section in Chapter 4 describing the data compatibility with existing models.)

### 2-2 Panel ROM types and functions

#### (1) Types of panel ROMs

The following four types of panel ROMs can be used with the VG-823.

- \* EE-PROM ..... HN58C65P-25 (standard panel ROM: 64Kb, 250ns) made by Hitachi  
HN58C256P-20 (standard panel ROM: 256Kb, 200ns) made by Hitachi
- \* E-PROM ..... 2764 (64Kb, 250ns) made by various companies
- \* EE-PROM ..... AH-3000 (expansion panel ROM: 512Kb, 250ns) option available through Astrodesign

**(2) Panel ROM functions****Table 2-1**

	HN58C65P-25	HN58C256P-20	AH-3000	2764
Write data using RB-649, RB-647				× (*1)
Read data using RB-649, RB-647				
Read data using VG-823				
Number of programs which can be entered	40	160	320	40
Number of user characters which can be entered	4	8	15	4
Number of groups which can be entered	2	40	8	2

\*1) Since data cannot be written into the 2764 (EPROM) with the VG series, use the HN58C65P-25 as the master to write the data with a ROM writer.

## 2-3 Precautions for using AH-3000

- ◆ Number of digits used for program numbers

The AH-3000 (expansion panel ROM: option) has a capacity which enables 320 programs to be entered.

It is divided into 1) an area equivalent to 40 programs of the conventional panel ROM and 2) an expansion area equivalent to the remaining 280 of the 320 programs.

For the program numbers applicable when the AH-3000 has been installed as the panel ROM, enter two digits for program numbers 01 to 40 in exactly the same way as for the existing panel ROM.

Since the program numbers in the expansion area extend from 500 to 779, use three digits to assign them.

## 2-4 Precautions for using HN58C256P panel ROM

- ◆ Number of digits used for program numbers

The HN58C256P panel ROM has a capacity which enables 160 programs to be entered.

It is divided into 1) an area equivalent to 40 programs of the conventional panel ROM and 2) an expansion area equivalent to the remaining 120 of these 160 programs.

For the program numbers applicable when the HN58C256P has been installed as the panel ROM, enter two digits for program numbers 01 to 40 in exactly the same way as for the existing panel ROM.

Since the expansion area is in turn divided into three blocks - program numbers 501 to 540, 601 to 640 and 701 to 740 - use three digits to assign these numbers

This panel ROM is used exclusively with the VG-822 and 823.

Due to differences in access speed, the data cannot be written on or read from the HN58C256P panel ROM with models other than the VG-822 and 823. Although the panel ROM may work with other models, do not use it since its operation cannot be guaranteed.

**Note:** Due to the fact that no E-PROM supporting the HN58C256P is currently being marketed, the HN58C256P cannot be used to copy data onto an E-PROM

# CHAPTER 3 SOFTWARE CONFIGURATION AND OPERATION

## 3-1 Software configuration

The VG-823 system consists of the following functions and modes.

### (1) Direct display function

This function selects the program, sets the timings and outputs the patterns when the **SET** key is pressed after the target program number has been selected using the **INC** and **DEC** keys.

It is used for adjustments on production lines, inspections, etc.

### (2) Auto display function

This repeatedly runs the program automatically in accordance with the setting conditions of the start and end program numbers and interval durations which have been entered in the panel ROM. It is used for demonstrations, aging, etc.

### (3) Self-diagnosis mode

This function checks the components of the VG-823. It can check the LEDs, RAMs, panel ROM and clock generation circuit.

Use it to check out these devices when trouble has occurred in the operation of the signal generator.

(Refer to Chapter 7 for more details on the self-diagnosis mode.)

### (4) Terminal mode

This function controls the VG-823 from a personal computer or other external computer. The commands and data are transferred through the serial I/O port (RS-232C).

The program editing software (SP-8000 series: option) and operation box (RB-647: option) are also used in this mode.

For details on operations in this mode, refer to the instruction manual of the equipment concerned.

## 3-2 Operations before switching on the power

### 3-2-1 Installing the panel ROM and connecting the optional units

- (1) Connect the outputs of the VG-823 to the display.

(With some displays there may be problems if the timings and signals are not as specified.)

- (2) Open the cover of the panel ROM socket area, and install the panel ROM containing the data prepared by the RB-647, SP-8000 series or VG-819.

To secure the panel ROM in the ROM socket, raise the lever, install the panel ROM (taking care not to install it backwards), and then pull the lever down flat.



- (3) To use the remote control box (RB-649, RB-614C: option), connect it to the REMOTE connector.

### 3-2-2 DIP switch settings

- When the generator is shipped from the manufacturing plant, its DIP switches are at the settings indicated by the shading in Table 3-1.
- To change a setting, be absolutely sure to turn off the power, perform the setting as per the table below, and then turn the power back on again.  
(DIP switch settings changed after the power has been turned on will not be valid.)

**Table 3-1**

SW No.	Function	Operation at ON/OFF setting
SW1	Selection of buzzer tone	ON : Buzzer is on.
		OFF : Buzzer is off.
SW2	Selection of panel ROM or internal timing	ON : Panel ROM timing executed
		OFF : Internal timing executed
SW3	Selection of horizontal timing setting accuracy	ON : Horizontal timing is set in 1-dot increments
		OFF : Setting accuracy changes according to dot clock (see *1)
SW4	Selection of polarity when HS, VS and CS are OFF	ON : Low when OFF
		OFF : High when OFF
SW5	Selection of single-touch selection mode (see Section 5-3-2)	ON : Mode is not used.
		OFF : Mode is established.
SW6	Selection of key lock function (see *2)	ON : Mode is not used.
		OFF : Mode is established.
SW7	Not used	OFF Keep this at OFF at all times.
SW8	Not used	ON Keep this at ON at all times.

**Note:** If SW5 is set to OFF when the remote control box (RB-649, RB-614C: option) is used, pattern selection using the direct display function and group display function (see functions which can be used with the RB-614C in Chapter 5) can be performed in a single-touch operation. (However, a multiple number of patterns cannot be displayed simultaneously, and some of the optional patterns cannot be displayed.)

- \*1) When SW3 is set to OFF, the dot setting accuracy for the horizontal timing is set to 1-, 2- or 4-dot increments as with the VG-819.

Dot clock (MHz)	Setting accuracy
5.00-60.00	1-dot increments
60.01-120.00	2-dot increments
120.01-250.00	4-dot increments

- \*2) Selection of the key lock function places restrictions on the functions which can be performed by RB-614C or RB-649.  
With both the RB-614C and RB-649, only function 7 (group display) can be executed.

## 3-3 Operation of functions

### 3-3-1 Direct display function

This executes the timing and pattern data entered in the panel ROM merely by inputting the program number.

#### (1) To initiate this function

To initiate the direct display function, set the power switch on the side panel to ON without pressing any of the keys.

\* **The panel ROM may be damaged if the power is turned on by plugging in the AC cord or by disconnecting this cord and then re-connecting it.**

#### (2) LED initial display

When the power is turned on, the display shown in Fig. 3-1 appears.

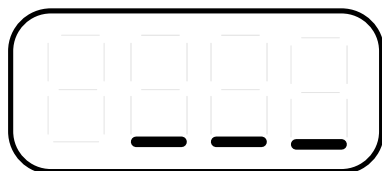


Fig. 3-1

#### (3) Key operations

**INC** key                      Increments the program number by 1.

**DEC** key                      Decrements the program number by 1.

**SET** key                      Executes the program corresponding to the number selected, and outputs the signals.

First, select the target program number by pressing the **INC** or **DEC** key while watching the LED display.

When the **SET** key is next pressed, the signals are output.

#### 《Description》

- The pattern which is output here is the one entered in the pattern select data (see Note) when the panel ROM data was prepared.
- When the power is turned on, no signals are output from the signal generator.
- The signals which are output when the **SET** key is pressed continue to be output until the **SET** is next pressed even if the program number is changed using the **INC** or **DEC** key.
- If the remote control box (RB-649, RB-614C: option) or operation box (RB-647: option) is used, another pattern entered under the same program number can be selected and

displayed or another program number can be selected simply by inputting its 2-digit program number. (The **INC**, **DEC** and **SET** keys need not be operated.)

**Note :** This data assigns the pattern, included among the many patterns entered in one program, which is to be displayed using the direct display function or auto display function.

If the data entered in the selected program contains an error, the error buzzer will sound when the **SET** key is pressed, and an error message will appear on the LED. Errors are described in Section 8-1 on error messages.

### 3-3-2 Auto display function

This executes auto display in accordance with the auto display data entered in the panel ROM. (Auto display data: sequence of numbers of programs to be displayed, interval durations for switching between the programs)

#### (1) To initiate this function

To initiate the auto display function, turn on the power while keeping the **SET** key depressed. The auto display function starts immediately.

**Note 1:** When the program data to be displayed using this function contains an error, the error buzzer will sound, the program number concerned will be skipped, and the program with the next program number will be executed.

**Note 2:** When no auto display data has been set, the error buzzer will sound and operation will stop. Check the panel ROM data.

#### (2) To stop the auto display

Turn off the power to stop the auto display.

### 3-3-3 Using the internal sample program data

Forty sets of typical computer timing data are entered in the VG-823.

Use this data when no panel ROM is installed or when the display timing is unknown.

The internal sample timing data can be used as the copy source when using the copy function (panel ROM copy function) described in Section 5-4.

How to use the sample data and what is entered in the VG-823 are described below.

#### (1) How to use the internal sample timing data

Set DIP SW2 on the top panel to OFF, and turn on the power. This establishes the mode for reading the internal sample timing data.

**Note:** A panel ROM may be installed but it is recommended that it be removed in this mode to prevent misoperation.

The steps taken after this mode has been established are the same as for the direct display function: the three keys (**INC**, **DEC** and **SET**) are used to select the program number and run the program.

**Note:** The In01 display lights simultaneously with the program number on the LED display during sample timing execution. The “ In ” enables this mode to be differentiated from the panel ROM mode.

To transfer from this mode to the mode for running the panel ROM programs, first turn off the power. Then set DIP SW2 to ON, and turn the power back on.

**Note:** When this step is not taken, the panel ROM programs are not run even if the panel ROM has been installed.

## (2) Contents of sample timing data

Refer to the list of internal timing data in Section 8-2.

The pattern data in the programs are all exactly identical.

Pattern select data:

- Programs No.01 to 40..... Color bars (8 colors)

**Note 1:** Other patterns can be selected using the remote control box (RB-649, RB-614C: option) or operation box (RB-647: option).

**Note 2:** The single-touch pattern selection mode (see Section 5-3-2) is established if DIP SW5 is set to OFF while the remote control box is used.

# CHAPTER 4 DATA COMPATIBILITY WITH CONVENTIONAL SIGNAL GENERATORS

This chapter describes the differences between the VG-823 and conventional models, and it outlines the precautions to be watched when preparing the panel ROM for the VG-823 using a conventional model.

## 4-1 Concerning ROM compatibility with conventional models

The model VG-823 is basically designed to be compatible with conventional models in all aspects with the exception of the dot clock frequencies. This means that the ROMs of conventional models can be used with the VG-823 without modification.

However, in this case, the differences outlined below may cause some of the setting conditions to change or errors to result. When panel ROMs of another model are to be employed, check their timings already entered.

## 4-2 Differences from conventional signal generators

The dot clock setting range has been expanded from 5.00 to 250.000 MHz.

The horizontal sync timing can be set in 1-dot increments.

The H front porch and H blanking setting ranges are different from those of other models.

Table 4-1 shows the differences between the VG-823 and conventional models.

**Table 4-1**

Item		VG-823	VG-822	VG-813	VG-812
Dot clock (MHz)		5.00-250.00	5.00-220.00	5.00-150.00	5.00-120.00
H timing setting security (CLK MHz)		Entire area: 1-dot increments	Entire area: 1-dot increments	Entire area: 1-dot increments	Entire area: 4-dot increments
Output conditions	HDTV 3-level sync output	Not possible	Not possible	Not possible	Not possible
	Video output level (V)	0.30-1.20	0.30-1.20	0.30-1.20	0.30-1.20
	Composite video sync output level (V)	0.00-0.60	0.00-0.60	RS-343A ratio (possible only with G/SYNC)	RS-343A ratio (possible only with G/SYNC)
	Setup level (V)	0.00-0.25	0.00-0.25	ON/OFF at RS-343A ratio	ON/OFF at RS-343A ratio

Item		VG-814	VG-819(815)	VG-829
Dot clock (MHz)		5.00-75.00	5.00-240.00 (135.00)	5.00-440.00
H timing setting security (CLK MHz)		Entire area: 2-dot increments	5.00- 60:1dot 60.01-120:2dot 120.01-240:4dot (135)	5.00-110:1dot 110.01-220:2dot 220.01-440:4dot
Output conditions	HDTV 3-level sync output	Possible	Not possible	Not possible
	Video output level (V)	0.30-1.00	0.30-1.20	0.30-1.20
	Composite video sync output level (V)	0.04-0.43	0.00-0.60	0.00-0.60
	Setup level (V)	ON/OFF	0.00-0.25	0.00-0.25

## CHAPTER 5 FUNCTIONS USABLE WITH RB-614C

The functions described below can be executed by connecting the optional RB-614C (remote control box) to the VG-823 and operating it.

### 5-1 Direct display function

- (1) Press the  or  key to select the target program number and output the program.
- (2) The program can be output (with no need to operate the **SET** key) simply by selecting the 2-digit program number.  
When the **SET** key is pressed with the program already output, the program name (No., name, horizontal and vertical frequencies) display at the top left of the screen can be turned on.

### 5-2 Group display function

- (1) Group data

Whereas with direct display the programs are run in numerical sequence such as 01 02 03 and so on or 01 40 39 and so on by incrementing or decrementing the numbers (using the  or  key), with group display the programs are run in the sequence in which the program numbers were entered (group data) using the group data edit function.

This means that, by the use of group data, the numerical sequence used can be assigned without changing the sequence in which the program numbers were entered in the panel ROM.

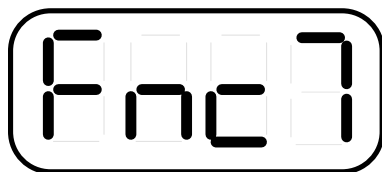
Enter the group data using VG-819 (version 5.0 or higher), VG-829 (version 1.3 or higher), optional RB-647 or RB-649 or the program edit software.

Group data can be entered by using either the optional remote control model (RB-649) or other optional products (RB-647 operation box and SP-8000 series of program editing software). Furthermore, panel ROMs with data entered for applications involving existing models in the VG series (VG-812, 813, 814, 815, 819, 822 or 829) can be used in their original form.

- (2) To initiate this function

When the panel ROM containing the group data is installed and the RB-614C's **FUNC** key is pressed, the characters shown in Fig. 5-1 appear on the LED display.

Fig. 5-1



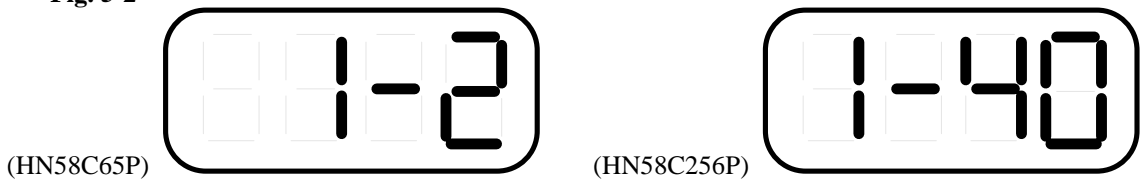
- (3) Select the group number.

If the **7** and **SET** keys are subsequently pressed, a number such as the one shown in Fig. 5-2 appears. When 1 and 2 or 01 to 40 are assigned as the group number, the program whose number was entered first in the group data is now executed. The LED display shows the number of the program executed.

**Note:** When no group data has been entered in the panel ROM, an error will result when a group number is assigned.

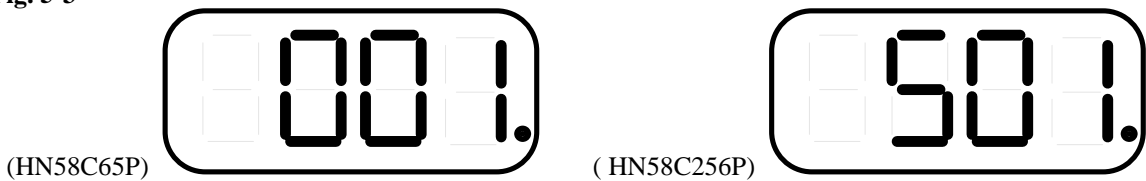
< Display appearing when group number is selected >

**Fig. 5-2**



< Display appearing after group display has been executed >

**Fig. 5-3**



**Note:** The period at the right end of the figures shown above flashes during group display execution.

Use the **□** and **□** keys for the following operations.

- Key ..... This increments the program number now on the display.
- Key ..... This decrements the program number now on the display.
- FUNC** Key ..... This stops execution and returns operation to the direct display mode.

- (4) To select the pattern indicated in (3) above while leaving the program number unchanged, first press the pattern key now selected, and then press the target pattern key.

《Key operation》 (Example: Switching from character to crosshatch)

**CHARA**, **CROSS**

- (5) When DIP SW5 is set to OFF and this function is executed, the patterns described in (4) above can be switched in a single-touch operation. The crosshatch pattern is selected simply by pressing the pattern key corresponding to the pattern to be selected (**CROSS** in the example given above).

**Note:** When DIP SW5 is set to OFF, it is not possible to display a multiple number of patterns simultaneously or display some of the optional patterns.

- (6) Press the **FUNC** key to exit this function.



## 5-3 Single-touch switching function

### 5-3-1 Concerning the single-touch switching function

With direct display and group display, the selection of a pattern using the same program number can be accomplished by a single-touch action. In this mode, when a new pattern is selected, the pattern displayed until now is canceled, and only the newly selected pattern is displayed.

### 5-3-2 To enter the single-touch switching mode

- Follow the procedure below to set the DIP switches.

Set the VG-823's POWER switch to the OFF position.

Set DIP SW5 to OFF, and set the VG-823's POWER switch to the ON position.

Proceed with the direct display or group display.

**Note:** Even when a multiple number of patterns have been entered in the program pattern select data of the program executed, only the pattern with the highest priority will be selected for display. The sequence of priority is listed below.



Next, when another pattern is selected using the same program number, the previous pattern is automatically canceled.

## 5-4 Panel ROM copy function

"All copy" of panel ROMs can easily be performed using this function.

The function can also be used to copy the data of panel ROMs used for other models.

- (1) Regarding combinations of copy source and copy destination panel ROMs

"All copy" is possible for copying data when the panel ROM at the copy source is of the same type as that at the copy destination. However, only the data in the program No.1-No.40 area is copied if one panel ROM is a standard type and the other is the AH-3000 or HN58C256.

- (2) DIP switch settings

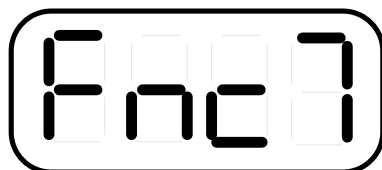
- When SW2 is set to ON and the power is turned on, copying between panel ROMs is enabled.
- When SW2 is set to OFF and the power is turned on, the internal timing data can be copied into the panel ROM. In this case, the panel ROM need not be installed as the copy source.

- (3) Operation method

Install the copy source panel ROM in the socket, and press the **FUNC** key.

The following characters appear on the LED display, and the function selection mode is established.

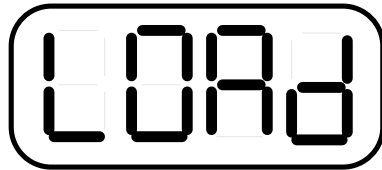
Fig. 5-4



Now press **4** and the **SET** key to select the panel ROM copy function.

The following characters appear on the LED display, and the mode is established for loading the data from the copy source into the VG-823.

**Fig. 5-5**

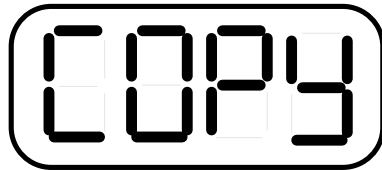


Check that the panel ROM has been installed securely in the socket, and press the **SET** key.

- There is no need to install the panel ROM when SW2 has been set to OFF (internal timing mode).

Loading from the panel ROM is completed in an instant, the following characters appear on the LED display, and the mode is established for copying the data to the copy destination.

**Fig. 5-6**

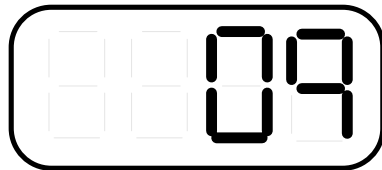


Now remove the copy source panel ROM from the socket, and install the copy destination panel ROM.

Press the **SET** key.

The LED display now starts counting down as shown below, and the data is written into the ROM.

**Fig. 5-7**



Upon completion of the copying, the display returns to the status shown in Fig. 5-5 above, and further copying is possible in this status.

To exit copying and return to the direct display, press the **FUNC** key.

# CHAPTER 6 FUNCTIONS USABLE WITH THE RB-649

The functions described below can be executed by connecting the optional RB-649 (remote control box) to the VG-823 and operating it.

## 6-1 Direct display function

- (1) Press the and keys to select the number of the target program number and output the program.
- (2) The program can also be output by assigning its 2-digit number. (The **SET** key need not be pressed to output the program.)

When the **SET** key is pressed with the program already output, the display of the program name (no., name and H/V frequencies) in the top left of the screen can be turned ON or OFF.

## 6-2 Group display function [FUNCTION7]

- (1) The outline and basic operations of this function are identical to the group display function outlined in Section 5-2.
- (2) To activate the group display function:

There are two ways of doing this when the RB-649 is used.

Install the panel ROM containing the group data and press the key on the RB-649.

The characters shown in Fig. 6-1 appear on the LED display, and the function can then be activated by pressing the and keys.

Fig. 6-1

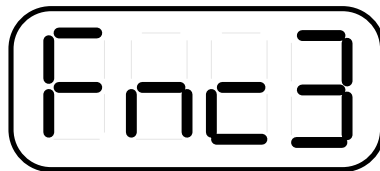


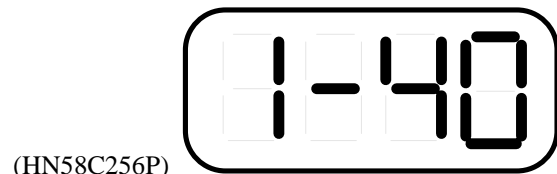
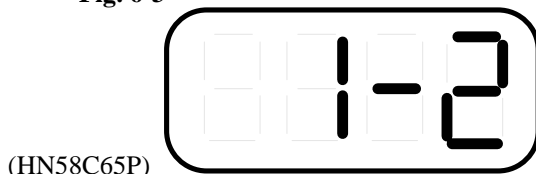
Fig. 6-2



Install the panel ROM containing the group data and press the key on the RB-649.

The characters shown in Fig. 6-3 appear on the LED display, and the function is activated.

Fig. 6-3




- (3) The subsequent steps are the same as those for the group display function in Section 5-1. However, when the key is pressed during group display execution, the characters shown in Fig. 6-2 appear on the LED display, and the group number selection status is established. Press the key to exit this function.

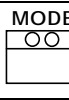









### 6-3 Single-touch switching function

- (1) The outline of this function is identical to the single-touch pattern switching function outlined in Section 5-3 but regular pattern switching or single-touch pattern switching can be selected without setting the DIP switches.
- (2) To activate this mode, first turn on the VG-823's power, and then select a program number and execute direct display. The regular pattern switching mode is now established.

**Note:** This mode is automatically established when DIP switch 5 is set to OFF and the power is turned on. (The red LED in the MODE key is lighted.) This procedure is useful when only this mode is to be used on production lines, for instance.

- (3) Selecting regular pattern switching or single-touch pattern switching






Press the  key to select one of the functions

 status	Description of displays
 LED off	Regular pattern switching; multiple pattern superimposing are possible.
Press the  key.	The red LED lights.
 red LED on	Single-touch pattern switching; only one pattern selected by the pattern priority sequence is displayed. When another pattern has been selected by a pattern key, the previous pattern is automatically canceled, and the selected pattern alone is displayed. Multiple patterns cannot be superimposed but program names can be superimposed using the  key.
Press the  key.	The green LED lights.
 green LED on	Single-touch pattern switching; operation is the same as when the red LED lights but when the  key is pressed, the time chart (H/V timing data, output conditions) of the program being executed are displayed in addition to its name.
Press the  key.	Operation returns to the  status in . The status selected in , or is retained even if the program number is changed.








## 6-4 HS/VS/CS ON/OFF and NEGA/POSI switching

This function can be used to simulate the power-saving function of computer displays as specified in the VESA standards.


- (1) In the existing VG series, the HS, VS and CS output status is determined by the data set in the panel ROM and no changes can be made to these during direct display execution. However, the VG-823 enables these





output conditions to be changed on a real-time basis using the  ,  ,  ,  and  keys on the RB-649. It is also possible to check the specific status by observing the LED.

- (2) ON/OFF and NEGA/POSI switching

 status	Description of displays
The  key is used for ON/OFF and NEGA/POSI switching.	
When the  LED is off	The ON/OFF status can be changed using the HS, VS and CS keys.
Press the  key.	The red LED lights.
 red LED on	The NEGA/POSI status can be changed using the HS, VS and CS keys.
Press the  key.	Operation returns to the  status in .

- (3) ON/OFF switching

Set to the  LED off status.


The ON/OFF status can be changed by pressing the  ,  ,  , and  keys.




**Note:** "S/G" denotes sync on green.

The status is indicated by the LED displays.

LED on: output ON; LED off: output OFF

- (4) NEGA/POSI switching

Set to the  red LED on status.

The NEGA/POSI status can be changed by pressing the  ,  and  keys.

The specific status is indicated by the LED displays.

LED on: NEGA; LED off: POSI

## 6-5 Panel ROM editing function (FUNC3)

### 6-5-1 Concerning the panel ROM editing function (FUNC3)

This function enables the program data (H timing, V timing, output conditions, pattern, pattern select) employed by the user to be prepared or changed, and entered in the panel ROM.

### 6-5-2 To activate the panel ROM editing function (FUNC3)

First, execute direct display, and check that the pattern is displayed on the analog monitor.

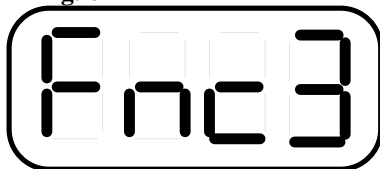
\* The timing (horizontal and vertical frequencies) does not matter provided that one of the patterns is displayed. However, part (the bottom) of the menu will not be displayed unless the timing for a resolution of more than 640 x 480 dots applies.

\* The panel ROM editing function cannot be executed on a TTL monitor.

When the key on the RB-649 is pressed, the characters shown in Fig. 6-4 appear on the LED display.

If the key is then pressed, the function displayed is activated.

**Fig. 6-4**



The above appears next to the vertical frequency on the monitor.

```
PROGRAM No.001   VGA480  H:31.47KHz  V:59.94Hz  [FUNC3]
```

### 6-5-3 Concerning the on-screen menu function

When this function is activated, the timing editing menu shown in Fig. 6-5 appears on the monitor. Available with the panel ROM editing function are four editing menus which can be selected using the MODE key.

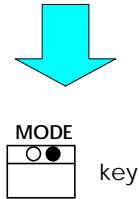
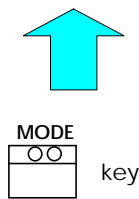
Fig. 6-5

PROGRAM No.001		VGA480	H : 31.47 KHz	V : 59.94 Hz	
MODE	: dot	MODE	: H		
CLOCK	: 25.17 MHz	VTOTAL	: 16.684 msec	525 H	
HPERIOD	: 31.78 μ sec	800 dot	VDISP	: 15.254 msec	480 H
HDISP	: 25.43 μ sec	640 dot	VSYNC	: 0.063 msec	2.0 H
HSYNC	: 3.81 μ sec	96 dot	VBACKP	: 0.794 msec	25 H
HBACKP	: 1.91 μ sec	48 dot	EQP FP	: 0.000 msec	0.0 H
HDSTART	: 0.00 μ sec	0 dot	EQP BP	: 0.000 msec	0.0 H
HDWIDTH	: 0.00 μ sec	0 dot	SERRATION	: OFF	
		EQP	: OFF		
OUTPUT	: ANALOG	VDSTART	: 0.000 msec	0.0 H	
NRZ/RZ	: NRZ	VDLINE	: 0.000 msec	0.0 H	
SYNC ON	:	SCAN	: NONINT		
HS	: NEGA				
VS	: NEGA				
CS	: NEGA				
HD	: POSI				
VD	: POSI	VIDEO	: 0.70 V		
RGB	: POSI	SYNC	: 0.30 V		
HALF	: NEGA	SETUP	: 0.00 V		
CLOCK	: NEGA				

Timing editing menu  
(H/V timing, output conditions)

PROGRAM No.001		VGA480	
GRAPHIC COLOR R	: 255	BURST FORMAT	: 0
G	: 255	STEP	: 30 dot
B	: 255	INTERVAL	: 1 dot
BACKGROUND	: OFF		
		WINDOW MODE	: %
CHARACTER FORMAT	: 1	HWIDTH	: 25.0 %
CODE	: E3 H	VWIDTH	: 25.0 %
FONT	: 64 × 64	R	: 255
CELL	: 64 × 60	G	: 79
		B	: 79
CROSSHATCH H	: 319 dot	FORMAT	: 1
V	: 1 dot	FLICKER	: 0
DOT H	: 25 dot	OPTION PATTERN1	: 00
V	: 25 dot	OPTION PATTERN2	: 05
CIRCLE FORMAT	: 4		

Pattern data 1 editing menu  
(CHARA,CROSS,DOTS,CIRCLE,BURST,WIND,OP1,OP2)

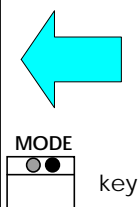


PROGRAM No.001	VGA480	Enable
CHARA	COLOR	R
CROSS	GRAY	G
DOT	BURST	B
CIRCLE	WINDOW	INVERSE
+	OPTION1	RHT
	OPTION2	GHT
x	NAME	BHT

Pattern select data editing menu  
(pattern select, program name, enable/disable)

PROGRAM No.001	VGA480		
COLORBAR MODE	: dot	GRAYSCALE DIRECTION	: 1
HWIDTH	: 64 dot	LEVEL-0	: 255
VWIDTH	: 60 dot	LEVEL-1	: 191
DIRECTION	: 3	LEVEL-2	: 159
COLOR-0	: RGB	LEVEL-3	: 255
COLOR-1	: R	LEVEL-4	: 191
COLOR-2	: G	LEVEL-5	: 159
COLOR-3	: RG	LEVEL-6	: 224
COLOR-4	: B	LEVEL-7	: 191
COLOR-5	: R B	LEVEL-8	: 159
COLOR-6	: GB	LEVEL-9	: 255
COLOR-7	: RGB	LEVEL-A	: 223
COLOR-8	: GB	LEVEL-B	: 127
COLOR-9	: R	LEVEL-C	: 223
COLOR-A	: R B	LEVEL-D	: 191
COLOR-B	: G	LEVEL-F	: 127
COLOR-C	: G	LEVEL-F	: 224
COLOR-D	: RGB		
COLOR-E	: RG		
COLOR-F	: B		


Pattern data 2 editing menu  
(COLOR BAR, GRAY SCALE)




## 6-5-4 Operations common to all program editing functions

### (1) Entering program data

Proceed with the editing operations described below on one of the menus, and press


the  key to enter the data into the panel ROM.


Data can be entered into the panel ROM on any menu, and the following message appears when


the  key is pressed.

“PROGRAM No.    XXX    0=SAVE    1=NOTSAVE    2=EXIT”    ?

To enter the data being edited into the panel ROM, press the  key; to cancel the entry,





press the  key.

When the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.



Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

### (2) How to move the cursor

The cursor indicates which item is to be set by highlighting it. Move the cursor position to the

targeted item using the  and  keys, and input data using the  to  number keys.

When the cursor is at the very top (or bottom), it will move to the very bottom (or top) when the

 or  key is pressed.

### (3) Calling another program number and editing the data


The data in a program with another number can be called from the panel ROM during editing on any menu, edited and entered. When this function is used, the data in a multiple number of programs can be edited and entered.

**Note:** The on-screen menu can be displayed regardless of the timings (horizontal and vertical frequencies) but the character size is reduced with the timings of high resolutions. It is recommended that this function be activated with VGA-equivalent timings, the number of the program to be edited be called and operations be performed.



Assign two digits to call program numbers 01 to 40 and three digits to call number of 500 or more.


How to call the number of another program and edit its data after checking the program entry






The following message appears on the monitor when the  key is pressed.

"PROGRAM No.    XXX    0=SAVE    1=NOTSAVE    2=EXIT"    ?




To enter the data being edited into the panel ROM, press the  key; to cancel the entry, press the  key.

When the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

When the  or  key is pressed, the following message appears on the monitor.

"NEW PROGRAM No. ---"    ?

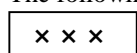


Input the new program number using the  to  keys, and then press the  key.

After the data in the program whose number was just input is loaded from the panel ROM and the new data is displayed on the monitor, the program data can be edited.




At this time, the signals which are output from the model VG-823 are still those of the previous program number.

How to call and edit another program after inputting its number

The following message appears on the monitor when the cursor is moved to the "PROGRAM No.

 location at the very top of the screen using the  or  key.


"NEW PROGRAM No. ---"    ?



Input the new program number using the  to  keys, and then press the  key.

After the data in the program whose number was just input is loaded from the panel ROM and the new data is displayed on the monitor, the program data can be edited.

At this time, the signals which are output from the model VG-823 are still those of the previous program number.


**(4) Exiting the program editing function**





This function is exited by pressing the  key.

When the  key is pressed during editing on one of the menus, the panel ROM editing function is suspended, and operation returns to the direct display function. In this case, the program data being edited is not entered into the panel ROM. To enter the data into the panel ROM, press the  key before exiting from this function.


**6-5-5 Concerning the editing of H timing, V timing and output conditions**



- (1) When the  key is pressed, the H timing, V timing and output condition editing data is displayed on the monitor.  
Data can be input into the highlighted item.


- (2) Move the highlighting to the data to be changed using the  and  keys, and then input the data using the  to  keys.


- (3) Entering the H timing, V timing and output conditions


The following message appears when the  key is pressed.


" PROGRAM No. XXX 0=SAVE 1=NOTSAVE 2=EXIT" ?

To enter the data being edited into the panel ROM, press the  key; to cancel the entry,



press the  key


When the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

When the  key is pressed, the program data editing function is suspended, and

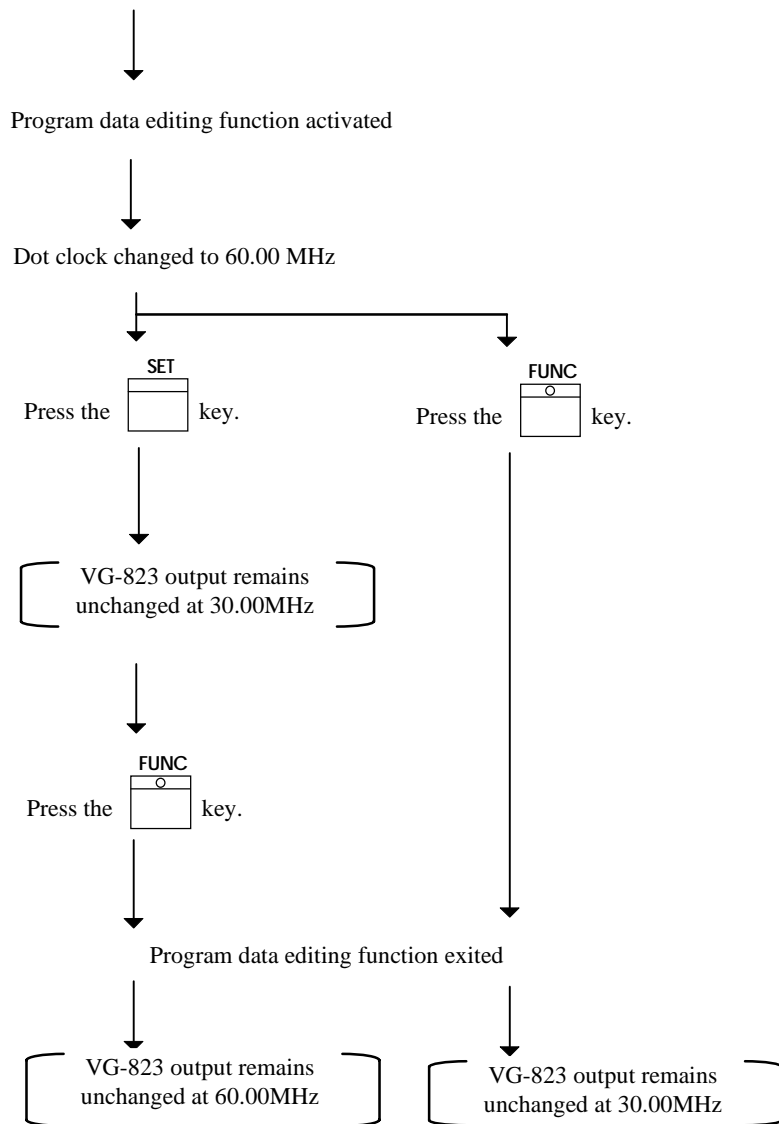
operation returns to the direct display function. In this case, the data is not entered into the panel ROM.

Even when the data has been changed and entered into the panel ROM using the  key, the output status of the model VG-823 will not change on a real-time basis. It is only when operation is returned to direct display using the  key that the output status reflects the data after the change.

When the  key is pressed, operation is switched to pattern data 1 editing described in section 6-5-9.

**(Example)**

Executing direct display program 10 (30.00 MHz dot clock)



### 6-5-6 Timing data setting range

The setting ranges (numerical data only) for the model VG-823's timing data are indicated in the following tables.

Dot Clock	5.00 to 250.00Hz
-----------	------------------

**Table 4-2**

For dot clock frequencies from 5.00 to 110.00 MHz

Horizontal timing	H PERIOD	3.90 to 99.99 $\mu$ sec	89 to 8192 dots
	H DISP	0.20 to 99.00 $\mu$ sec	16 to 4000 dots
	H SYNC	0.40 to 40.00 $\mu$ sec	12 to 2000 dots
	H BACK P	0.00 to 90.00 $\mu$ sec	0 and 4 dots to 4076 dots
	HD START	0.00 to 99.00 $\mu$ sec	0 to 4090 dots (in 4-dot increments)
	HD WIDTH	0.00 to 99.00 $\mu$ sec	0 to 4090 dots (in 4-dot increments)
	H FRONT P	Automatically calculated	When H display is in 4-dot increments: 0 and 4 or more dots When H display is not in 4-dot increments: 7 or more dots
	H BLANKING	Automatically calculated	When all H timings are in 4-dot increments: 64 or more dots When not all H timings are in 4-dot increments: 73 or more dots

For dot clock frequencies from 110.01 to 250.00MHz

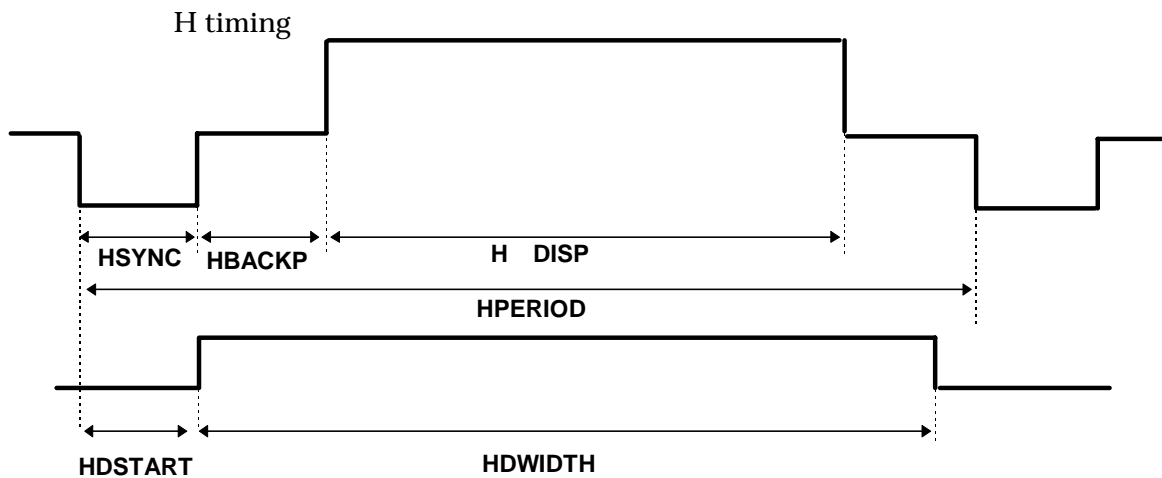
Horizontal timing	H PERIOD	3.90 to 99.99 $\mu$ sec	181 to 8192 dots
	H DISP	0.20 to 99.00 $\mu$ sec	30 to 4000 dots
	H SYNC	0.40 to 40.00 $\mu$ sec	24 to 2000 dots
	H BACK P	0 to 90.00 $\mu$ sec	0 and 8 dots to 4076 dots
	HD START	0 to 99.00 $\mu$ sec	0 to 4090 dots (in 8-dot increments)
	HD WIDTH	0 to 99.00 $\mu$ sec	0 to 4090 dots (in 8-dot increments)
	H FRONT P	Automatically calculated	When H display is in 8-dot increments: 0 and 8 or more dots When H display is not in 8-dot increments: 15 or more dots
	H BLANKING	Automatically calculated	When all H timings are in 8-dot increments: 128 or more dots When not all H timings are in 8-dot increments: 149 or more dots

Vertical timing	V TOTAL	100 to 8192 H (Interlace ) 100 to 4096 H (Interlace & sync, interlace & video)
	V DISP	16 to 4000 H
	V SYNC	1.0 to 99.0 H
	V BACKP	0 to 4000 H
	EQP FP	0.0 to 99.0 H
	EQP BP	0.0 to 99.0 H
	VD START	0.0 to 4095.0 H
	VD LINE	0.0 to 4095.0 H

### 6-5-7 Inputting the H timing data

Input the data within the setting ranges shown in the table below.

Item	Setting range	
MODE	<div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center;">0</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center;"> <input type="text"/> </div> ... μ sec setting	<div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center;">1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center;"> <input type="text"/> </div> ... dot setting
CLOCK	5.00 to 250.00MHz	
HPERIOD	3.90 to 99.99 μ sec	
	Clock frequency of 110.00 and below: 89 to 8192 dots	
	Clock frequency of 110.01 and above: 181 to 8192 dots	
HDISP	0.20 to 99.00 μ sec	
	Clock frequency of 110.00 and below: 16 to 4000 dots	
	Clock frequency of 110.01 and above: 32 to 4000 dots	
HSYNC	0.40to 40.00 μ sec	
	Clock frequency of 110.00 and below: 12 to 2000 dots	
	Clock frequency of 110.01 and above: 24 to 2000 dots	
HBACKP	0.00 to 90.00 μ sec	
	Clock frequency of 110.00 and below: 0 and 8 to 4076 dots	
	Clock frequency of 110.01 and above: 0 and 8 to 4076 dots	
HDSTART	0.00 to 99.00 μ sec	
	Clock frequency of 110.00 and below: 0 to 4090 dots (4-dots increments)	
	Clock frequency of 110.01 and above: 0-4090 dots (8-dots increments)	
HDWIDTH	0.00 to 99.00 μ sec	
	Clock frequency of 110.00 and below: 0 to 4090 dots (4-dots increments)	
	Clock frequency of 110.01 and above: 0 to 4090 dots (8-dots increments)	

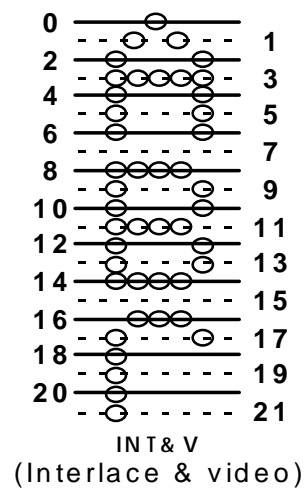
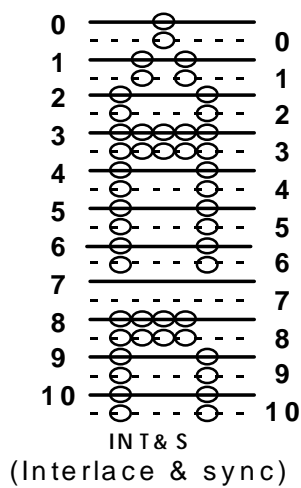
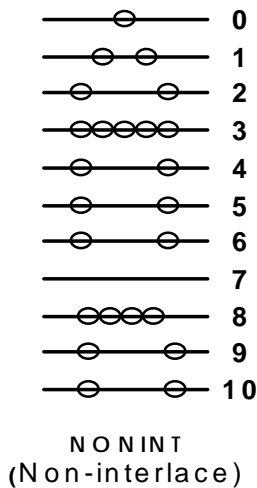


### 6-5-8 Inputting the V timing data

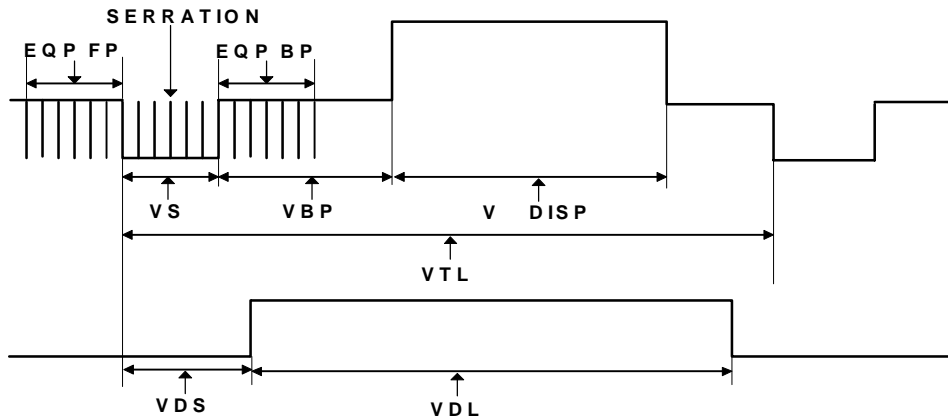
Input the data within the setting ranges shown in the table below

Item	Setting range

MODE	0 ... H setting		1 ... msec setting	
VTOTAL	Non-interlace		100 to 8192H	
	Interlace & sync/video		100 to 4096H	
	7.960 to 99.999msec			
VDISP	16 to 4000H			
	1.270 to 99.999msec			
VSYNC	1.0 to 99.0H			
	0.070 to 99.999msec			
VBACKP	0 to 4000H			
	0.000 to 99.999msec			
EQP FP	0.0 to 99.0H			
	0.000 to 99.999msec			
EQP BP	0.0 to 99.0H			
	0.000 to 99.999msec			
SERRATION	0 · OFF	1 ... 0.5H	2 ... 1.0H	3 ... XOR
	EQP 0 ... OFF		1 ... ON	
	VDSTART			
	0.0 to 4095.0H		0.000 to 99.999msec	
VDLINE				
0.0 to 4095.0H		0.000 to 99.999msec		
SCAN	0 ... NONINT		1 ... INT&S	
			2 ... INT&V	

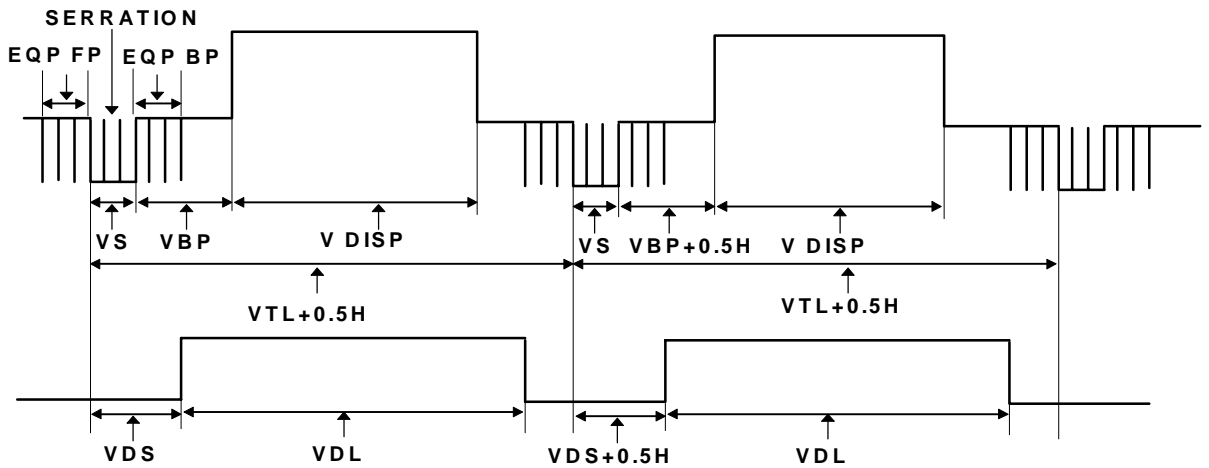


\* For non-interlace



VTL	V TOTAL
VS	V SYNC
VBP	V BACKP
EQP FP	EQP FP
EQP BP	EQP BP
VDISP	V DISP
VDS	VD START
VDL	VD LINE

\* For interlace



• Even-numbered field

• Odd-numbered field

VTL	V TOTAL
VS	V SYNC
VBP	V BACKP
EQP FP	EQP FP
EQP BP	EQP BP
VDISP	V DISP
VDS	VD START
VDL	VD LINE

**Note 1:** When INT&S (interlace & sync) or INT&V (interlace & video) has been selected as SCAN item, set the number of scanning lines per field in the V timing data.

**Note 2:** When the H setting has been selected as MODE item

When HPERIOD is input, the following calculations are performed inside the VG-823 so that the millisecond values of the V timing data are changed.

The H values in the V timing data remain unchanged.

(Equation)

$$VTOTAL(msec) = \frac{VTOTAL(H) \times HPERIOD(\mu sec)}{1000}$$

$$VDISP(msec) = \frac{VDISP(H) \times HPERIOD(\mu sec)}{1000}$$

The same calculations are performed for VSYNC, VBACKP, EQFPF, EQBPB, VDSTART and VDLIN.

**Note 3:** When a millisecond setting has been selected for the MODE item

When HPERIOD is input, the following calculations are performed inside the VG-823 so that the H values of the V timing data are changed.

The millisecond values in the V timing data remain unchanged.

(Equation)

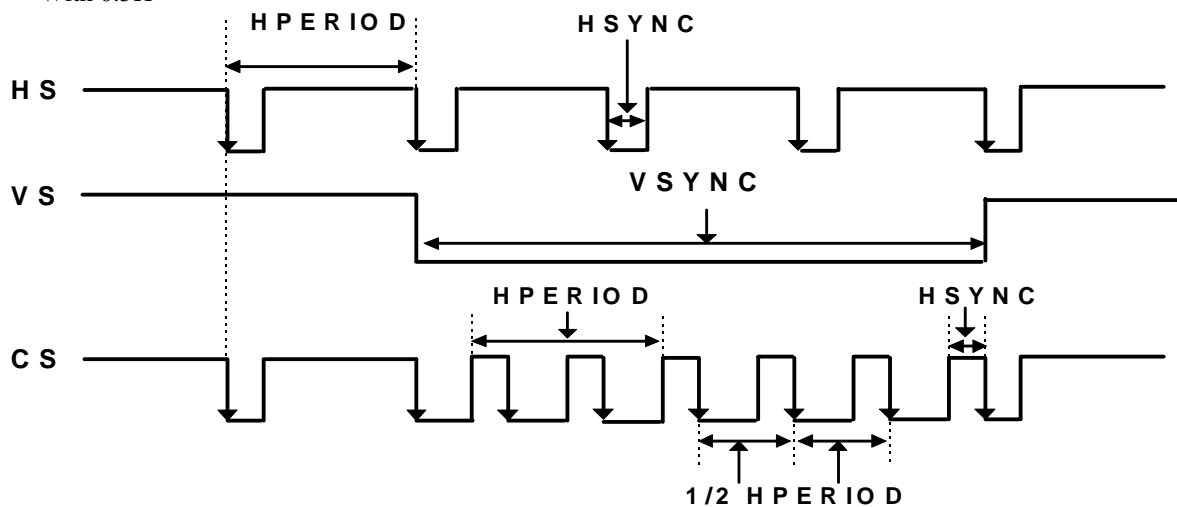
$$VTOTAL(msec) = \frac{VTOTAL(H) \times 1000}{HPERIOD(\mu sec)}$$

$$VDISP(msec) = \frac{VDISP(msec) \times 1000}{HPERIOD(\mu sec)}$$

The same calculations are performed for VSYNC, VBACKP, EQFPF, EQBPB, VDSTART and VDLIN.

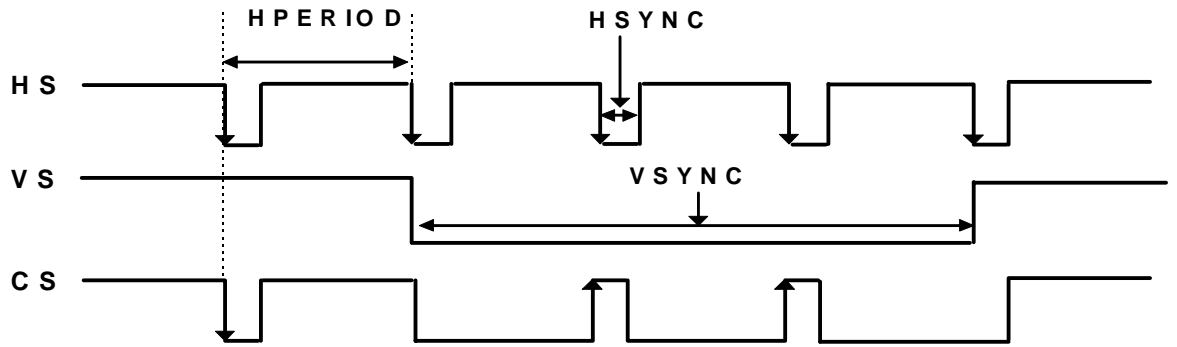
<Example 1> SERRATION phase correlation

With 0.5H

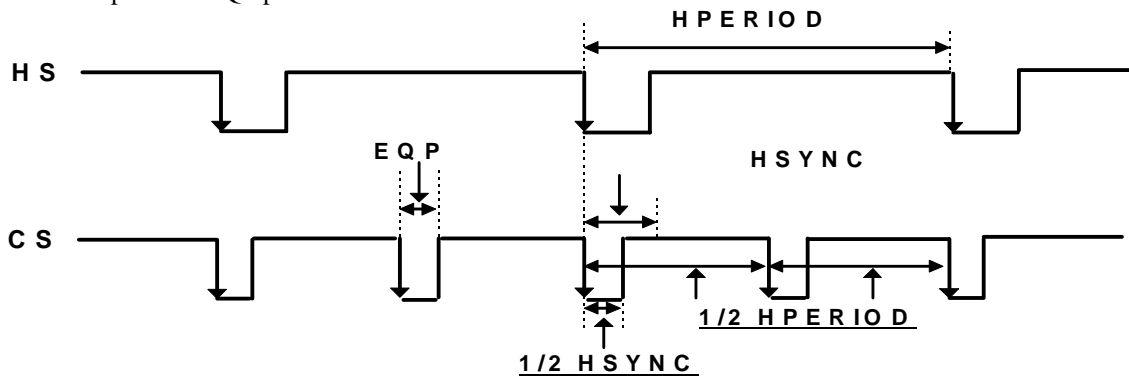




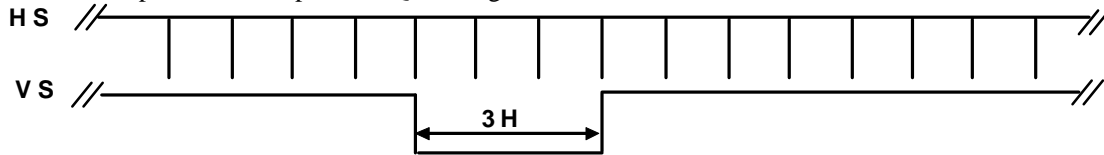
With XOR



<Example 2> EQP phase correlation



<Example 3> Examples of EQP settings



<Example 3-1>

EQP FP	0H
EQP BP	0H
EQP	OFF
SERRATION	OFF



<Example 3-2>

EQP FP	0H
EQP BP	0H
EQP	OFF
SERRATION	0.5H



<Example 3-3>

EQP FP	3H
EQP BP	3H
EQP	ON
SERRATION	1H



<Example 3-4>

EQP FP	3H
EQP BP	0H
EQP	OFF
SERRATION	OFF



(6) Inputting the output condition data

Input the data within the setting ranges shown in the table below.

Item	Setting range
OUTPUT	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... ANALOG</div> <div style="text-align: center;">1 <input type="checkbox"/> ... TTL</div> </div>
NRZ/RZ	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NRZ</div> <div style="text-align: center;">1 <input type="checkbox"/> ... RZ</div> </div>
SYNC ON	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... None</div> <div style="text-align: center;">1 <input type="checkbox"/> ... R</div> <div style="text-align: center;">2 <input type="checkbox"/> ... G</div> <div style="text-align: center;">3 <input type="checkbox"/> ... RG</div> </div>
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">4 <input type="checkbox"/> ... B</div> <div style="text-align: center;">5 <input type="checkbox"/> ... RB</div> <div style="text-align: center;">6 <input type="checkbox"/> ... GB</div> <div style="text-align: center;">7 <input type="checkbox"/> ... RGB</div> </div>
HS	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> <div style="text-align: center;">2 <input type="checkbox"/> ... OFF</div> </div>
VS	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> <div style="text-align: center;">2 <input type="checkbox"/> ... OFF</div> </div>
CS	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> <div style="text-align: center;">2 <input type="checkbox"/> ... OFF</div> <div style="text-align: center;">3 <input type="checkbox"/> ... HS</div> <div style="text-align: center;">4 <input type="checkbox"/> ... VS</div> </div>
HD	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> </div>
VD	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> </div>
RGB	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> </div>
HALF	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> </div>
CLOCK	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">0 <input type="checkbox"/> ... NEGA</div> <div style="text-align: center;">1 <input type="checkbox"/> ... POSI</div> </div>
VIDEO	0.30-1.20V
SYNC	0.00-0.60V
SETUP	0.00-0.25V

**Note 1:** When ANALOG has been selected for the OUTPUT item, TTL output R, G, B, RHT, GHT and BHT cannot be used.

When TTL has been selected for the OUTPUT item, the ANALOG output cannot be used.

**Note 2:** When OFF has been selected for the HS item, both the ANALOG output and TTL output are set OFF.

**Note 3:** When OFF has been selected for the VS item, both the ANALOG output and TTL output are

set OFF.

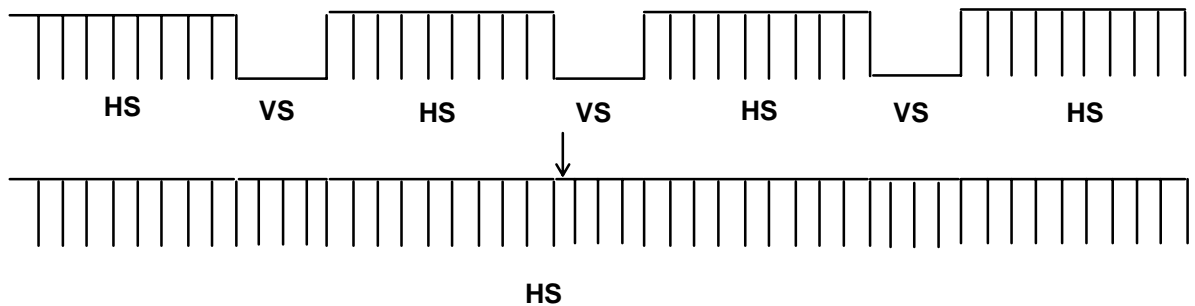
**Note 4:** When OFF has been selected for the CS item, both the ANALOG output and TTL output are set OFF.

When HS or VS has been selected for the CS item, HS or VS is set for SYNC of the ANALOG output, TTL output and SYNC on VIDEO.

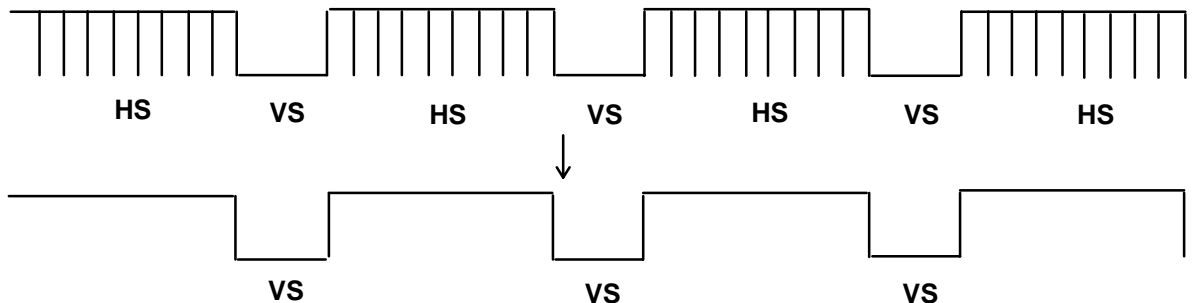
Polarity settings

There are five CS setting items, and each has its own address inside the VG-823. When CS is set to "N" or "P," CS is made negative or positive. To set the polarity when HS or VS is to be output from the CS connector, first select the polarity (N or P) and then set HS or VS. This will produce an HS or VS output with a negative or positive polarity.

Waveform diagram 1 When HS (NEGA) is output from CS connector



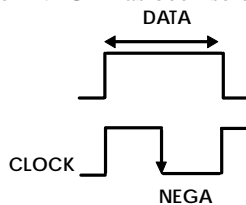
Waveform diagram 2 When VS (NEGA) is output from CS connector



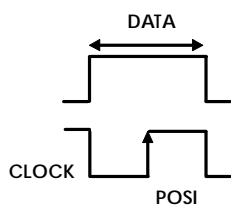
**Note 5:** Select the polarity of the TTL output R/G/B video signals for the RGB item.

**Note 6:** Select the polarity of the TTL output RHT/GHT/BHT half-tone signals for the HALF item.

**Note 7:** When NEGA has been selected for the CLOCK item




**Note 8:** When POSI has been selected for the CLOCK item







### 6-5-9 Pattern data 1 editing

(1) The data for pattern data 1 editing is displayed on the monitor while the red LED of the


 key is lighted

Data can be input for the highlighted item.

(2) Use the  and  keys to move the highlighting to the data to be changed, and input


the data using the  to  keys.


(3) Entering the pattern data 1


When the  key is pressed, the following message appears on the monitor.


"PROGRAM No.    XXX    0=SAVE    1=NOTSAVE    2=EXIT"    ?
--


To enter the data being edited into the panel ROM, press the  key; to cancel the entry,

press the  key.

If the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

If the  key is pressed, the program data editing function is aborted, and operation returns to direct display. In this case, the data is not entered in the panel ROM.

If the  key is pressed, operation is switched to the pattern data 2 editing described in Section 6-5-10.

(4) Inputting graphic color data

Input the data within the setting ranges shown in the table below.

When ANALOG has been selected for output condition data

Item	Setting range
GRAPHIC COLOR R	0-255
GRAPHIC COLOR G	0-255
GRAPHIC COLOR B	0-255

When TTL has been selected for the output condition data

Item	Setting range																
VIDEO RGB	<table border="0"> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> </tr> <tr> <td><input type="checkbox"/>...None</td> <td><input type="checkbox"/>...R</td> <td><input type="checkbox"/>...G</td> <td><input type="checkbox"/>...RG</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> </tr> <tr> <td><input type="checkbox"/>...B</td> <td><input type="checkbox"/>...RB</td> <td><input type="checkbox"/>...GB</td> <td><input type="checkbox"/>...RGB</td> </tr> </table>	0	1	2	3	<input type="checkbox"/> ...None	<input type="checkbox"/> ...R	<input type="checkbox"/> ...G	<input type="checkbox"/> ...RG	4	5	6	7	<input type="checkbox"/> ...B	<input type="checkbox"/> ...RB	<input type="checkbox"/> ...GB	<input type="checkbox"/> ...RGB
	0	1	2	3													
<input type="checkbox"/> ...None	<input type="checkbox"/> ...R	<input type="checkbox"/> ...G	<input type="checkbox"/> ...RG														
4	5	6	7														
<input type="checkbox"/> ...B	<input type="checkbox"/> ...RB	<input type="checkbox"/> ...GB	<input type="checkbox"/> ...RGB														
HALF TONE rgb	<table border="0"> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> </tr> <tr> <td><input type="checkbox"/>...None</td> <td><input type="checkbox"/>...r</td> <td><input type="checkbox"/>...g</td> <td><input type="checkbox"/>...rg</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> </tr> <tr> <td><input type="checkbox"/>...b</td> <td><input type="checkbox"/>...rb</td> <td><input type="checkbox"/>...gb</td> <td><input type="checkbox"/>...gb</td> </tr> </table>	0	1	2	3	<input type="checkbox"/> ...None	<input type="checkbox"/> ...r	<input type="checkbox"/> ...g	<input type="checkbox"/> ...rg	4	5	6	7	<input type="checkbox"/> ...b	<input type="checkbox"/> ...rb	<input type="checkbox"/> ...gb	<input type="checkbox"/> ...gb
	0	1	2	3													
<input type="checkbox"/> ...None	<input type="checkbox"/> ...r	<input type="checkbox"/> ...g	<input type="checkbox"/> ...rg														
4	5	6	7														
<input type="checkbox"/> ...b	<input type="checkbox"/> ...rb	<input type="checkbox"/> ...gb	<input type="checkbox"/> ...gb														

(5) Inputting the background data

Input the data within the setting ranges shown in the table below.

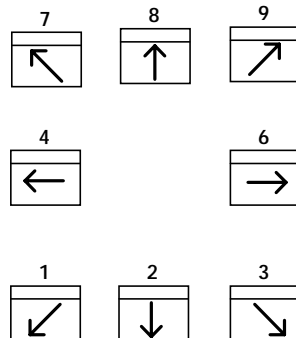
Item	Setting range				
BACKGROUND	<table border="0"> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> </tr> <tr> <td><input type="checkbox"/>...OFF</td> <td><input type="checkbox"/>...ON</td> </tr> </table>	0	1	<input type="checkbox"/> ...OFF	<input type="checkbox"/> ...ON
0	1				
<input type="checkbox"/> ...OFF	<input type="checkbox"/> ...ON				

(6) Inputting the character data

Input the data within the setting ranges shown in the table below.

Item	Setting range						
CHARACTER FORMAT	<table border="0"> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td><input type="checkbox"/> Character list</td> <td><input type="checkbox"/> All 1 character</td> <td><input type="checkbox"/> Corners &amp; center</td> </tr> </table>	0	1	2	<input type="checkbox"/> Character list	<input type="checkbox"/> All 1 character	<input type="checkbox"/> Corners & center
0	1	2					
<input type="checkbox"/> Character list	<input type="checkbox"/> All 1 character	<input type="checkbox"/> Corners & center					
CODE	With HN58C65 panel ROM      20-E3H      * 1						
	With HN58C256 panel ROM      20-E7H      * 1						
FONT	<table border="0"> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td><input type="checkbox"/>... 5 × 7</td> <td><input type="checkbox"/>... 7 × 9</td> <td><input type="checkbox"/>... 16 × 16</td> </tr> </table>	0	1	2	<input type="checkbox"/> ... 5 × 7	<input type="checkbox"/> ... 7 × 9	<input type="checkbox"/> ... 16 × 16
0	1	2					
<input type="checkbox"/> ... 5 × 7	<input type="checkbox"/> ... 7 × 9	<input type="checkbox"/> ... 16 × 16					
CELL	1-64 × 1-64						

\*1 Select the characters from the code table.

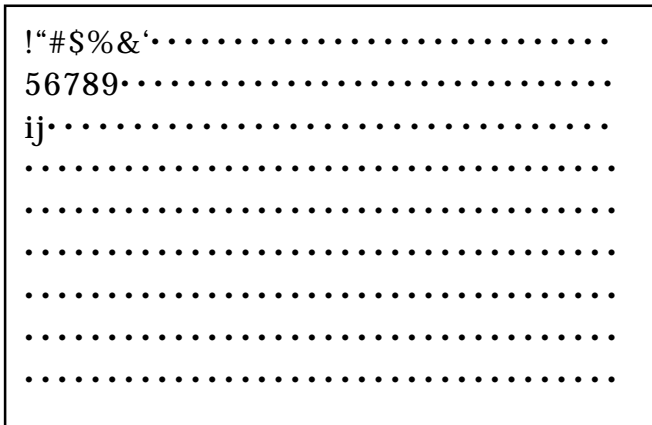


Use the following keys to move the cursor on the code table.

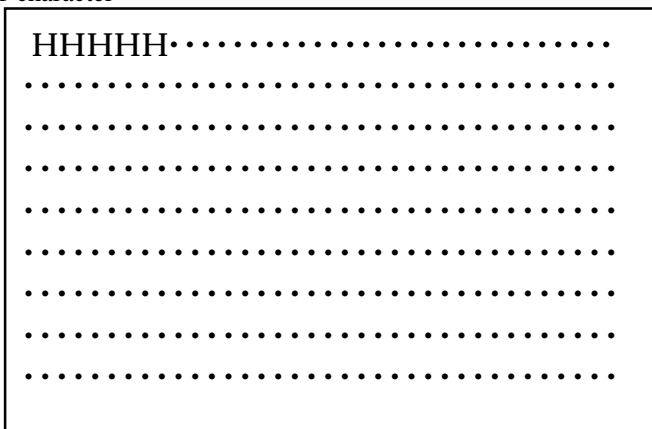
When the  key is pressed, the character is selected.

When E0 to E7H is set for the code, the font is automatically set to 64 x 64.

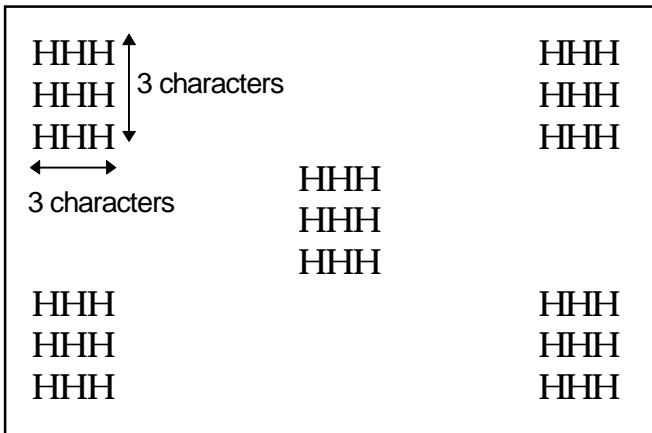
Character list



All 1 character



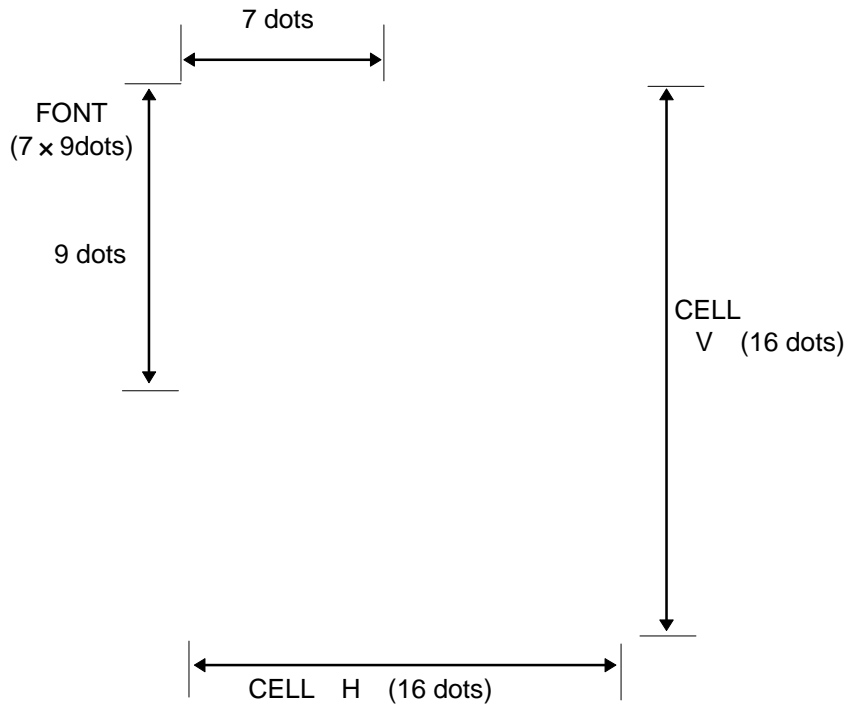
Corners & center



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



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

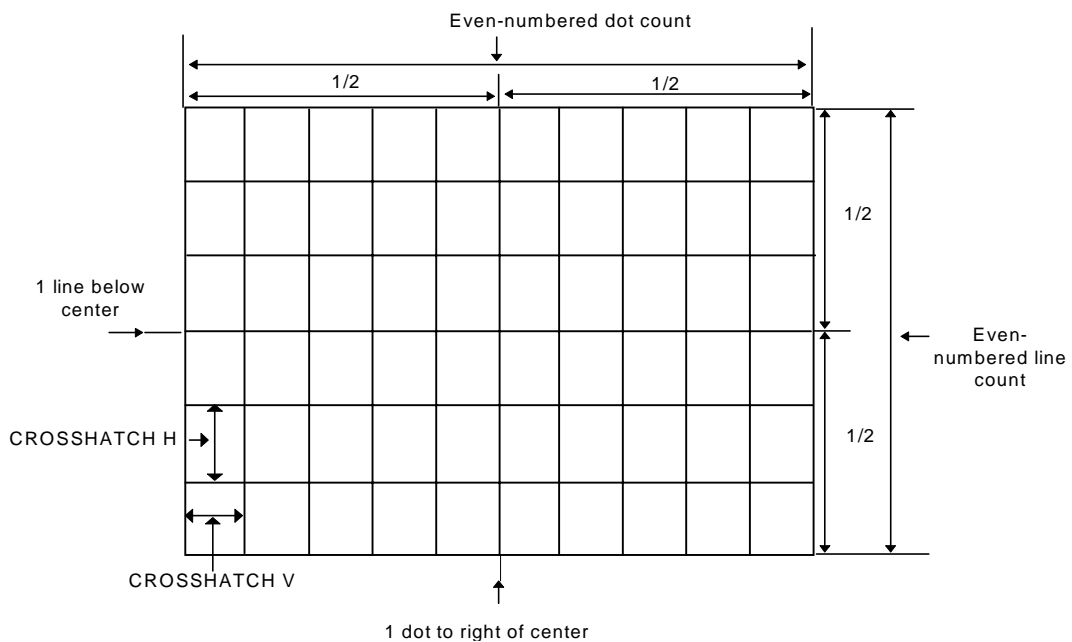


(7) Inputting the crosshatch data

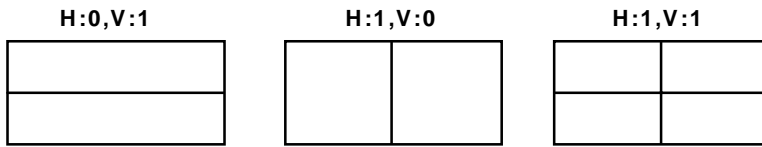
Input the data within the setting ranges shown in the table below.

Item	Setting range
CROSSHATCH H	0-9999 dots
CROSSHATCH V	0-9999 dots

Crosshatch patterns are always displayed after the screen center is calculated. When both the number of dots and number of lines displayed are set to odd numbers, the screen center can be calculated, but when they are set to even numbers, the point which is one dot to the right of the center and one line below it is used as the actual screen center.



\* Examples when "0 and 1", "1 and 0" and "1 and 1" settings are used for H: and V: are shown below.



An error results when both H and V are "0."

(8) Inputting the dot data

Input the data within the setting ranges shown in the table below.

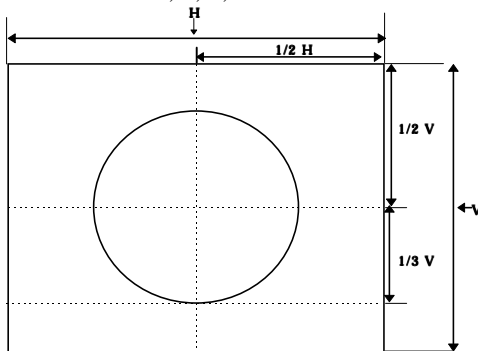
Item	Setting range
DOT H	1-9999 dots
DOT V	1-9999 dots

(9) Inputting circle data

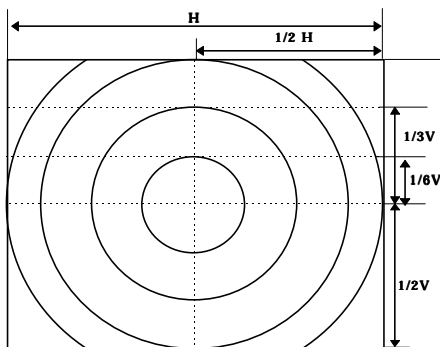
Input the data within the setting ranges shown in the table below.

Item	Setting range
CIRCLE FORMAT	0-4

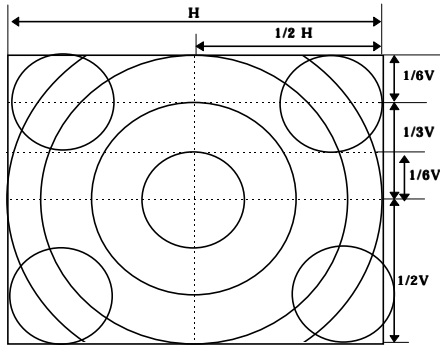
Select format 0, 1, 2, 3 or 4.



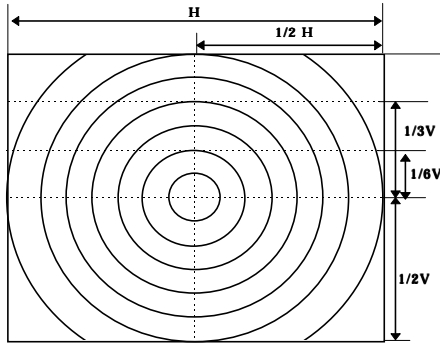
FORMAT **0** Single circle  
Center ... 1/2 H  
Radius ... 1/3 V



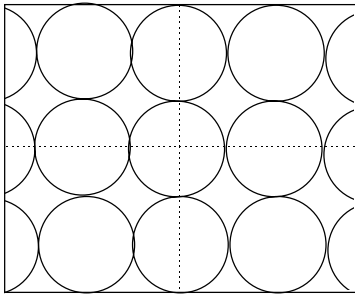
FORMAT **1** Concentric circles (1)  
Center ... 1/2 H, 1/2 V  
Radius (from center) ... 1/6 V, 1/3 V, 1/2 V, 1/2 H



FORMAT **2**  
 FORMAT **1** + (4 circles with 1/6V radius)



FORMAT **3** Concentric circles (2)  
 Center: 1/2 H, 1/2 V  
 Radius (from center): addition of other circles inside 1/6V, 1/3V, 1/2V circles, and addition



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.

(10) Inputting burst data

Input the data within the setting ranges shown in the table below.

Item	Setting range
BURST FORMAT	0 ~ 3
STEP	1 ~ 99 dot
INTERVAL	1 ~ 99 dot

Set the tracing start point with formats **0** to **3**, and set the step (thickness increment amount) and interval (number of lines with same thickness to be displayed).

FORMAT

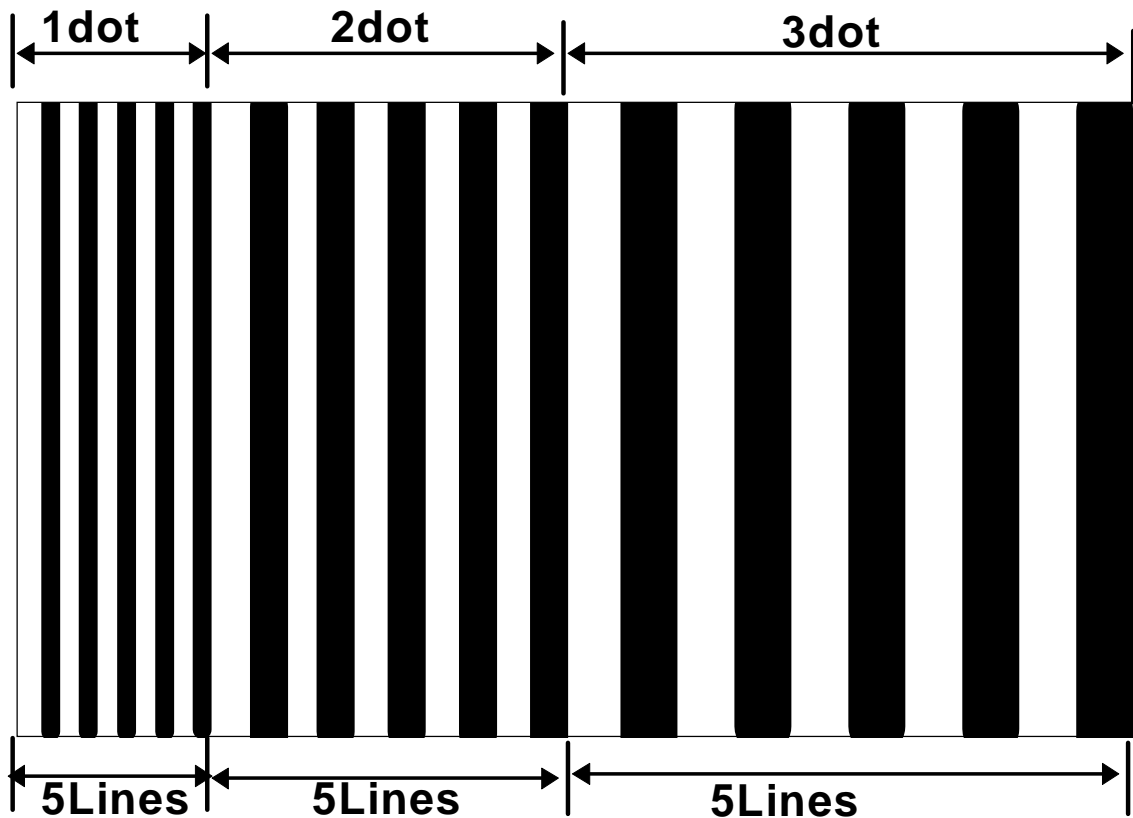
<b>0</b>	.....	Settings are incremented from left to right.
<b>1</b>	.....	Settings are incremented from right to left.
<b>2</b>	.....	Settings are incremented from center to left and right.
<b>3</b>	.....	Settings are incremented from left and right to center.

\* "Step" is an amount by which the thickness of the vertical lines is incremented.

\* "Interval" is the number of vertical lines displayed with the same thickness.

【Examples of settings】

Format 0, step 1, interval 5



(11) Inputting the window data

Input the data within the setting ranges shown in the table below.

Item	Setting range	
WINDOW MODE	0 <input type="text"/> ... setting in %	1 <input type="text"/> ... setting in dots
HWIDTH	MODE setting in %	0.1 to 100.0%
	MODE setting in dots	4-9996dot
VWIDTH	MODE setting in %	0.1 to 100.0%
	MODE setting in dots	1 to 9999dots
R	0 to 255	
G	0 to 255	
B	0 to 255	
FORMAT	0 to F	* 2
FLICKER	0 to 7	

\*2 Select the format from among those provided on the code table.  
Use the following keys to move the cursor on the code table.



When the  <sup>5</sup> key is pressed, the format is selected.

Select the flicker interval.

	With window format 0 to 7	With window format 8 to D (scroll)
0	No flicker	4-dot scrolling every V period
1	Flicker every V period	8-dot scrolling every V period
2	Flicker every two V periods	16-dot scrolling every V period
3	Flicker every four V periods	16-dot scrolling every V period
4	Flicker every eight V periods	16-dot scrolling every V period
5	Flicker every sixteen V periods	16-dot scrolling every V period
6	Flicker every thirty-two V periods	16-dot scrolling every V period
7	Flicker arises every sixty-four V periods	16-dot scrolling every V period

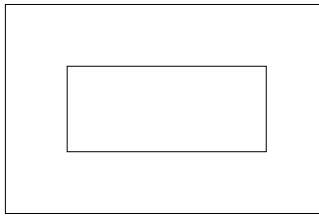
Select the number of windows, etc. by selecting one format from formats 0 to E.

Select the speed (with formats 0 to 7) with the flicker interval.

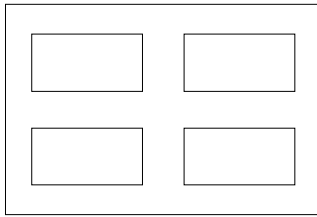
Select the scrolling speed (with formats 8 to E).

**Note:** The VG-823 shows the same display for "format F" as for "format 0."

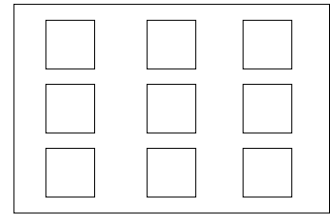
0



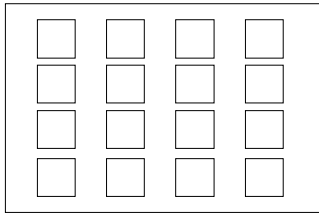
1



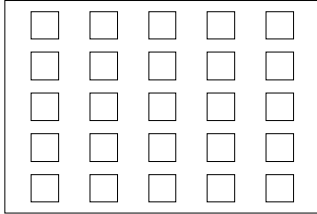
2



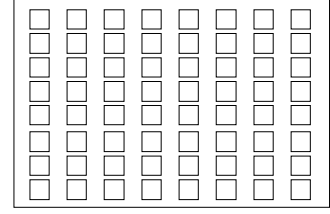
3



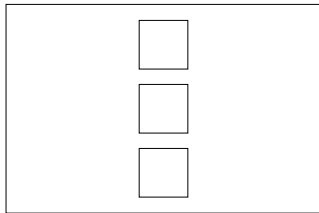
4



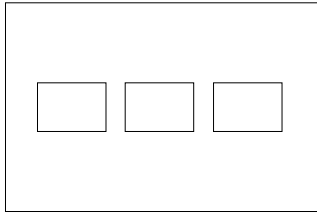
5



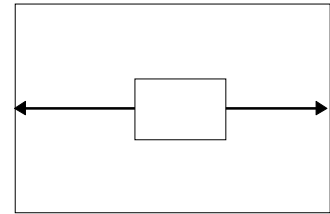
6



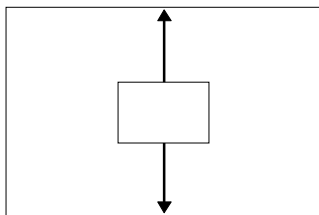
7



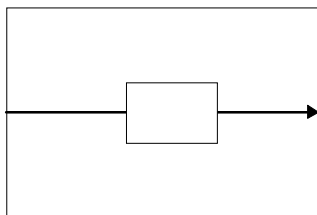
8 Horizontal scrolling



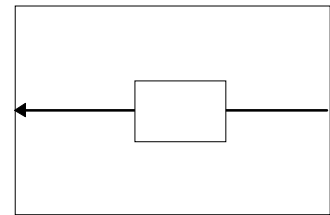
9 Vertical scrolling



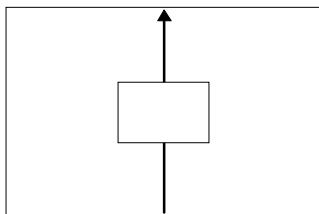
A Scrolling to the right



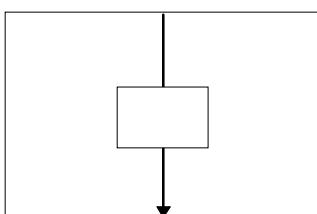
B Scrolling to the left



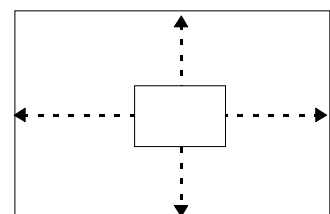
C Scrolling upward



D Scrolling downward



E Window (position assignment)



**Note:** Format E

This format is effective when using a panel ROM in which the position has already been assigned by another model (VG-815, VG-819 or VG-829) in the VG series.

Otherwise, the same display as for format 0 appears.

(12) Inputting the option pattern 1 data

Input the data within the setting ranges shown in the table below.

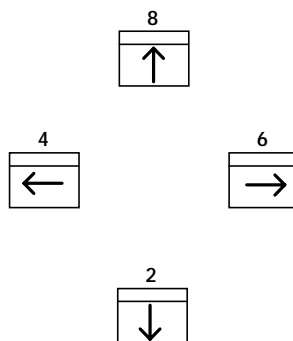
Item	Setting range
OPTION PATTERN1	00 ~ 1F * 3


(13) Inputting the option pattern 2 data

Input the data within the setting ranges shown in the table below.

Item	Setting range
OPTION PATTERN2	00 ~ 1F * 3

\*3 Select the option number from among those provided on the code table.  
Use the following keys to move the cursor on the code table.

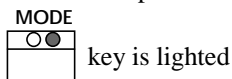


When the  key is pressed, the option number is selected.



**6-5-10 Pattern data 1 editing**





(1) The data for pattern data 1 editing is displayed on the monitor while the red LED of the




key is lighted. Data can be input for the highlighted item.

(2) Use the  and  keys to move the highlighting to the data to be changed, and input

the data using the  to  keys.

(3) Entering the pattern data 1

When the  key is pressed, the following message appears on the monitor.

"PROGRAM No.    XXX    0=SAVE    1=NOTSAVE    2=EXIT"    ?
--

To enter the data being edited into the panel ROM, press the  key; to cancel the entry,

press the  key.

If the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

If the  key is pressed, the program data editing function is aborted, and operation returns to direct display. In this case, the data is not entered in the panel ROM.

If the  key is pressed, operation is switched to the pattern data 2 editing described in 6-5-11.

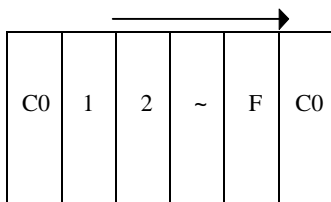
(4) Inputting color bar data

Input the data within the setting ranges shown in the table below.

Item	Setting range	
COLORBAR MODE	<input type="text" value="0"/> ... setting in %	<input type="text" value="1"/> ... setting in dots
HWIDTH	MODE setting in %	0.1 to 100.0%
	MODE setting in dots	4 to 9996 dots
VWIDTH	MODE setting in %	0.1 to 100.0%
	MODE setting in dots	1 to 9999 dots
DIRECTION	0 to 3	
COLOR-0	<input type="text" value="0"/> .. None	<input type="text" value="1"/> .. R
COLOR-F	<input type="text" value="2"/> .. G	<input type="text" value="3"/> .. RG
	<input type="text" value="4"/> .. B	<input type="text" value="5"/> .. RB
	<input type="text" value="6"/> .. GB	<input type="text" value="7"/> .. RGB

The color bar pattern is always traced from the top left corner of the screen at the interval provided. DIRECTION 0, 1, 2 or 3 is selected as the alignment direction.

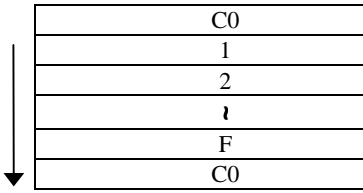
0..... Horizontal direction



The designated colors "C0-F" are repeated horizontally. The V interval is ignored.

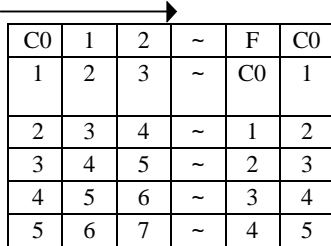


1..... Vertical direction



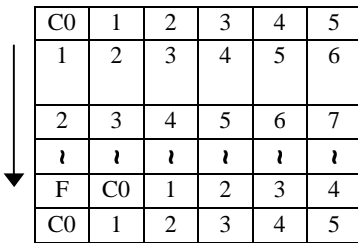
The designated colors "C0-F" are repeated vertically. The H interval is ignored.

2..... Horizontal direction



The designated colors "C0-F" are repeated horizontally, and when they reach the rightmost position, they are repeated on the next line which is separated from the first line by the V interval.

3..... Vertical direction



The designated colors "C0-F" are repeated vertically, and when they reach the bottom position, they are repeated in the next row which is separated from the first row by the H interval.

(5) Inputting the gray scale data

Input the data within the setting ranges shown in the table below.  
When ANALOG is selected for output condition data

Item	Setting range
GRAYSCALE DIRECTION	0 ~ 1
LEVEL-0 }	0 ~ 255
LEVEL-F	


When ANALOG is selected for output condition data

Item	Setting range												
HALFTONE DIRECTION	0 ~ 1												
COLOR-0 }	<table style="width: 100%; text-align: center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> <tr> <td>• None</td><td>• R</td><td>• G</td><td>• RG</td> </tr> </table>	0	1	2	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• None	• R	• G	• RG
0	1	2	3										
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
• None	• R	• G	• RG										
COLOR-F	<table style="width: 100%; text-align: center;"> <tr> <td>4</td><td>5</td><td>6</td><td>7</td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> <tr> <td>• B</td><td>• RB</td><td>• GB</td><td>• RGB</td> </tr> </table>	4	5	6	7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• B	• RB	• GB	• RGB
4	5	6	7										
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
• B	• RB	• GB	• RGB										






6-5-11 Pattern select data editing





The pattern select data assigns the patterns to be displayed when direct display, group play or auto display is executed.

- (1) The red and green LEDs of the  key light, and the pattern names, R/G/B, INVERSE and RHT/GHT/BHT are displayed on the monitor.


The pattern select ON status applies to the pattern whose name is highlighted.

- (2) Use the  and  keys to move the  mark to the pattern name to be changed, and input the  or  key to set pattern select ON or OFF.



 key... Pattern select OFF


 key... Pattern select ON (name is highlighted)


- (3) Entering the pattern select data


When the  key is pressed, the following message appears on the monitor.

"PROGRAM No.    XXX    0=SAVE    1=NOTSAVE    2=EXIT" ?

To enter the data being edited into the panel ROM, press the  key; to cancel the entry, press the  key.

If the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.





If the  key is pressed, the program data editing function is aborted, and operation returns to direct display. In this case, the data is not entered in the panel ROM.

### 6-5-12 Program name editing


Disable is set and entered to prohibit the use of a specific program in the panel ROM. A program whose number has been disabled cannot be executed by direct display, etc. Normally, the enable setting is used.

A name consisting of up to 8 characters is given to each program, and it can be displayed over the pattern at the top left of the display during direct display, group display or auto display execution.



- (1) The program names and enable/disable status are displayed on the monitor. Data can be input for the highlighted item..


- (2) Use the  and  keys to move the highlighting to the data to be changed, and input the data using the  to  keys.


- (3) Entering the program name


When the  key is pressed, the following message appears on the monitor.


"PROGRAM No. XXX 0=SAVE 1=NOTSAVE 2=EXIT" ?

To enter the data being edited into the panel ROM, press the  key; to cancel the entry, press the  key.



If the  key is pressed, all the data is checked. The data is entered in the panel ROM provided that no errors are found. If an error is found, an error message appears, and the data must be input again.

Press the  key if the program number is to remain unchanged. Operation is returned to data editing.

If the  key is pressed, the program data editing function is aborted, and operation returns to direct display. In this case, the data is not entered in the panel ROM.

If the  key is pressed, operation is switched to the H and V timing and output condition data editing described in Section 6-5-5.

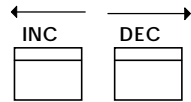
(4) Inputting the program name


Use the  and  keys to highlight the program name.

The table of codes for inputting the program name appears on the monitor.


Characters can now be input at the place where the program name is highlighted.

PROGRAM No.001 : ABCDEF<sup>█</sup>GH

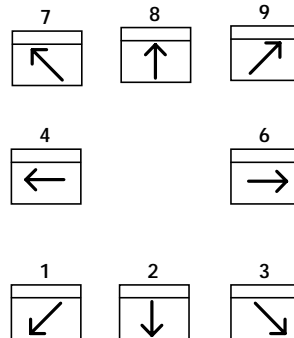


To move the highlighted character in the program name, use the  key to



move it to the left and  key to move it to the right.



Select the character to be input from among those in the program name input code table. If the  key is now pressed, the character is input into the program name.

Use the following keys to move the cursor on the program name input code table.



(5) Inputting the enable/disable data

Use the  and  keys to highlight Enable/Disable.

Item	Setting range
Enable/Disable	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>0</p>  <p>... Enable</p> </div> <div style="text-align: center;"> <p>1</p>  <p>... Disable</p> </div> </div>

Selecting "Disable" disables execution in the direct display mode.

## 6-6 Program editing function (FUNC2)

### 6-6-1 Concerning the program editing function (FUNC2)

This function prepares and changes the program data (H timing, V timing, output conditions, patterns, pattern select) in the buffer RAM inside the VG-823 before executing it.

Unlike the panel ROM editing function, this function cannot enter data into the panel ROM. It is used when the panel ROM data is to be left unchanged (no rewriting of contents) or when the panel ROM is an E-PROM.


Any data which has been input will be lost when the VG-823's power is turned off or when a program with another number is executed. Use the panel ROM editing function (FUNC3) to enter input data into the panel ROM.


The method used by this function to edit program data is the same as that used by the panel ROM editing function described in section 6-5.

### 6-6-2 To activate the program editing function (FUNC2)

Execute direct display, and check that the patterns are output to the analog monitor.

- ◆ The timing (horizontal and vertical frequencies) does not matter provided that one of the patterns is displayed. However, part (the bottom) of the menu will not be displayed unless the timing for a resolution of more than 640 x 480 dots applies.
- ◆ The program editing function cannot be executed on a TTL monitor.

When the  key on the RB-649 is pressed, the characters shown in Fig. 6-6 appear on

the LED display. If the  key is then pressed, the characters shown in Fig. 6-7 appear


on the LED display. When the  key is now pressed, the program editing function is activated.

Fig-6-6

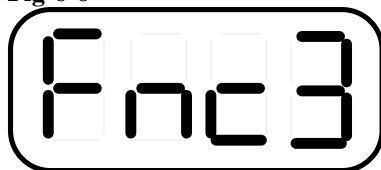
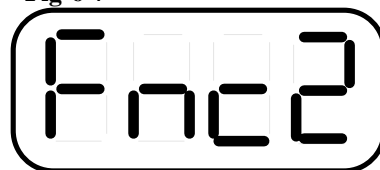
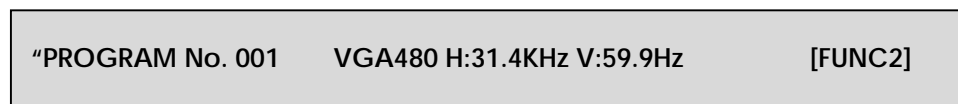


Fig-6-7




The above appears next to the vertical frequency on the monitor.







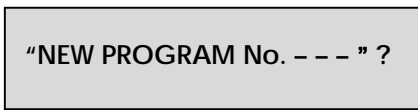
### 6-6-3 How to operate the program edit function



For details on subsequent operations, refer to the section on editing the H and V timing data and output conditions for FUNC3.

**Note:** Even if the  key is pressed in a subsequent operation, the data will be not entered into the panel ROM.


### 6-6-4 How to call and edit another program after inputting its number

First press the  key on the monitor or move the cursor to the "PROGRAM No. " position at the very top of the screen using the  or  key. The following message now appears on the monitor.



Continue by inputting the new program number using the  to  keys. After the data in the program whose number was just input is loaded from the panel ROM and the new data is displayed on the monitor, the program data can be edited. At this time, the signals which are output from the model VG-823 are still those of the previous program number.

### 6-6-5 Executing the program edit function

To execute the program data which has been changed on the on-screen menu, press the  key and exit from this function.

## 6-7 Panel ROM copy function (FUNC4)

"All copy" of panel ROMs can easily be performed using this function. The function can also be used to copy the data of panel ROMs used for other models.

Data can be copied in 1-program increments; the data prepared by character editing can also be copied.

### (1) Regarding combinations of copy source and copy destination panel ROMs

When "all copy" has been undertaken, the data is copied as shown in the table below.

Copy source	Copy destination	What is copied
HN58C65	HN58C65	The data is exactly the same as the copy source.
HN58C65	HN58C256	One of the following four choices can be made for the area into which the copy source data is to be copied.
Programs 01 to 40	Programs 01 to 40	
Programs 01 to 40	Programs 501 to 540	
Programs 01 to 40	Programs 601 to 640	
Programs 01 to 40	Programs 701 to 740	
HN58C65	AH-3000	The copy source data is copied into the program 01-40 area.

Copy source	Copy destination	What is copied
HN58C256	HN58C256	The data is exactly the same as the copy source.
HN58C256	HN58C65	The contents of the copy source's program 01-40 area are copied.
HN58C256	AH3000	The copy source areas as shown below are copied.
Programs 01 to 40	Programs 01 to 40	
Programs 501 to 540	Programs 500 to 539	
Programs 601 to 640	Programs 540 to 579	
Programs 701 to 740	Programs 580 to 619	
HN58C65	AH-3000	

Copy source	Copy destination	What is copied
AH3000	AH3000	The data is exactly the same as the copy source.
AH3000	HN58C65	The contents of the copy source's program 01-40 area are copied.
AH3000	HN58C256	The copy source areas as shown below are copied.
Programs 01 to 40	Programs 01 to 40	
Programs 500 to 539	Programs 501 to 540	
Programs 540 to 579	Programs 601 to 640	
Programs 580 to 619	Programs 701 to 740	

### (2) DIP switch settings


- When SW2 is set to ON and the power is turned on, copying between panel ROMs is


possible.

- When SW2 is set to OFF and the power is turned on, the internal timing data can be copied into the panel ROM.

In this case, no panel ROM needs to be installed as the copy source.

**(3) To activate the panel ROM copy function**

When the  key on the RB-649 is pressed, the characters shown in Fig. 6-8 appear on

the LED display. When the  key is pressed, the characters shown in Fig. 6-9 appear


on the LED display. This function can then be activated by pressing the  key.

Fig. 6-8

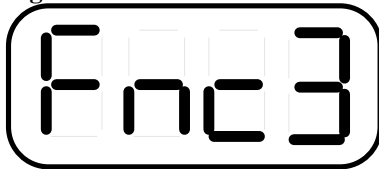
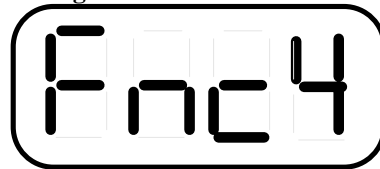












Fig. 6-9



**(4) Selecting the copy mode**


Select the copy mode using the  and  keys, and then press the  key.

	LED display		Significance of display
	All copy		All the data in the panel ROM is copied.
	Copying of 1 program		The data in the program whose number was designated is copied.
	Copying of timing data for 1 program		Only the timing data (H/V timing data, output conditions) for the program whose number was designated is copied.
	Copying of pattern data for 1 program		Only the pattern data (patterns, pattern select) for the program whose number was designated is copied.
	Copying of character editing data		The data prepared by character editing is copied.

**(5) Procedure for all copy**

The characters shown in Fig. 6-10 appear on the LED display. Install the panel ROM




serving as the copy source, and press the  key.

- ◆ When SW2 has been set to OFF (internal timing mode), no panel ROM needs to be installed.

**Fig. 6-10**





After the data in the copy source panel ROM has been loaded, the characters shown in Fig. 6-11 appear on the LED display. Install the panel ROM serving as the copy






destination, and press the  key.

**Fig. 6-11**



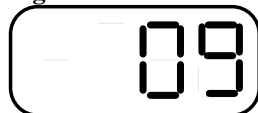
When HN58C65 has been set as the copy source and HN58C256 as the copy destination, the characters shown in Fig. 6-12 appear on the LED display. Select the area into which

the data is to be copied using the  key, and press the  key.


	LED display		Significance of display
Assign the area using the  key.	<b>Fig. 6-12</b>		The data is copied into the program 01-40 area.
			The data is copied into the program 501-540 area.
			The data is copied into the program 601-640 area.
			The data is copied into the program 701-740 area.


The characters shown in Fig. 6-13 appear on the LED display, countdown commences and the data is written.

**Fig. 6-13**






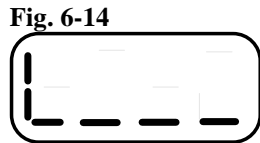
On completion of the copying, the characters shown in Fig. 6-10 appear on the LED display, and operation returns to the status in .




- \* If the  key is pressed during step or , the processing is suspended, and operation returns to the copy mode selection in (4).

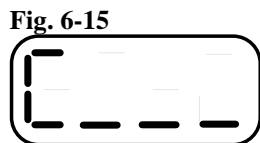
- \* If the  key is pressed during step or , the panel ROM copy function is suspended, and operation returns to direct display.

**(6) Copying of 1 program, timing data or pattern data**

The characters shown in Fig. 6-14 appear on the LED display. Install the panel ROM serving as the copy source, input the program number using the  to  keys, and then press the  key.



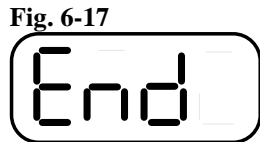
After the data in the copy source panel ROM has been loaded, the characters shown in Fig. 6-15 appear on the LED display. Install the panel ROM serving as the copy destination, input the program number using the  to  keys, and then press the  key.





The characters shown in Fig. 6-16 appear on the LED display, and the data is written.






On completion of the copying, the characters shown in Fig. 6-17 appear on the LED display, and operation returns to the status in .



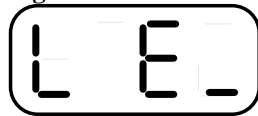
- \* If the  key is pressed during step or , the processing is suspended, and operation returns to the copy mode selection in (4).
- \* If the  key is pressed during step or , the panel ROM copy function is




suspended, and operation returns to direct display.

**(7) Copying of character editing data**

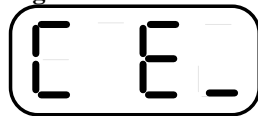
The characters shown in Fig. 6-18 appear on the LED display. Install the panel ROM serving as the copy source, input the character code using the  to  keys, and then press the  key.

**Fig. 6-18**



After the data in the copy source panel ROM has been loaded, the characters shown in Fig. 6-19 appear on the LED display. Install the panel ROM serving as the copy destination, input the character code using the  to  keys, and then press the  key.

**Fig. 6-19**



The characters shown in Fig. 6-20 appear on the LED display, and the data is written.



**Fig. 6-20**



On completion of the copying, the characters shown in Fig. 6-21 appear on the LED display, and operation returns to the status in .

**Fig. 6-21**



- \* If the  key is pressed during step or , the processing is suspended, and operation returns to the copy mode selection in (4).
- \* If the  key is pressed during step or , the panel ROM copy function is suspended, and operation returns to direct display.
- ◆ Program numbers by panel ROM and character code setting ranges

Panel ROM	Program No.	Character code
HN58C65	001 - 040	0 - 3
HN68C256	001 - 040 501 - 540 601 - 640 701 - 740	0 - 7
AH-3000	001 - 040 500 - 779	0 - 7

## 6-8 Character editing function (FUNC8)


### (1) Concerning the character editing function


The character editing function enables the user to edit characters and designs in a maximum 64 by 64-dot area and enter the results into panel ROMs. The characters entered in a panel ROM can be used as patterns by designating character codes as with internal characters.

### (2) To activate the character editing function

Execute direct display, and check that patterns are output properly to the analog monitor.

\* The character editing function cannot be executed on a TTL monitor.

When the  key on the RB-649 is pressed, the characters shown in Fig. 6-22 appear

on the LED display. If the  key is then pressed, the characters shown in Fig. 6-23


appear on the LED display. If the  key is now pressed, the character editing function is activated.

Fig. 6-22

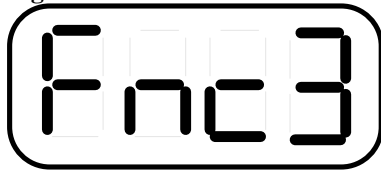





Fig. 6-23



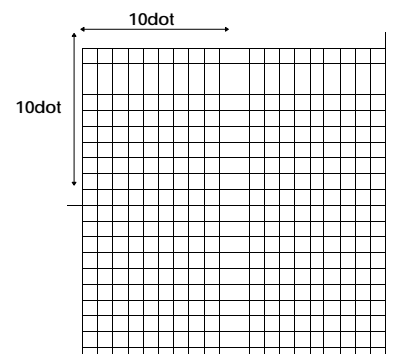
### (3) Selecting the character code

Use the  and  keys to select the character code from among the codes displayed on the monitor, and then press the  key.

### (4) 64 by 64-dot character display

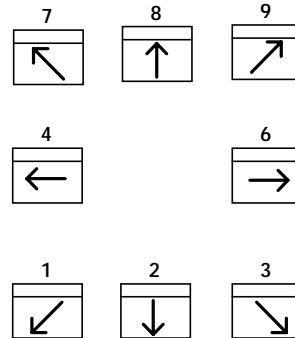
The characters are enlarged to the size of 64 dots by 64 dots on the monitor display.

A white square denotes that a dot is ON, and a black square that a dot is OFF.



A mark is provided every 10 dots from the top left.


Edit the characters using the keys shown below.






Moving the cursor: Move the cursor by one dot in the directions shown by the arrows.



Key	Operation
<p>0</p>	This clears (OFF) the status of the entire 64 by 64-dot area.
<p>5</p>	This reverses (ON OFF, OFF ON) the status of the dot where the cursor is positioned.
<p>MODE</p> <p>Red LED lights</p>	1-dot ON mode The dot to which the cursor has moved is automatically set ON.
<p>MODE</p> <p>Green LED lights</p>	1-dot OFF mode The dot to which the cursor has moved is automatically set OFF.
<p>INV</p>	This reverses the status of the entire 64 by 64-dot area.
<p>SET</p>	This writes the characters being edited into the panel ROM and returns operation to the character code selection in (3).
<p>FUNC</p>	This suspends the character editing function, and returns operation to direct display. The characters being edited are not written into the panel ROM.
<p>CHARA</p>	This loads the VG-823's internal characters (5x7, 7x9, 16x16) onto the 64 by 64-dot area.


**(5) Loading the VG-823's internal characters**



When  is pressed, three font sizes are displayed on the monitor.



Select the font size using the  and  keys, and then press the  key.

The character codes and characters are displayed below the three font sizes on the

monitor. Select the character to be loaded using the  and  keys.

Use the cursor movement keys in  to move the cursor over the 64 by 64-dot area to the position where the characters are to be loaded.

When the  key is pressed, the character is loaded at the cursor position, and then operation returns to .

\* If the CHARA key is pressed during step  or ③, operation returns to the status in .

\* If the CHARA key is pressed during step , operation returns to the status in (4).

**6-9 Group display data editing (FUNCTION6)**


**(1) Concerning group display data editing**


This function prepares the data for executing group display.

**(2) To activate group display data editing**

Execute direct display, and check that patterns are output properly to the analog monitor.

\* The group display data editing function cannot be executed on a TTL monitor.

If the  key on the RB-649 is pressed, the characters shown in Fig. 6-24 appear on the

LED display. If the  key is then pressed, the characters shown in Fig. 6-25 appear on


the LED display. If the  key is now pressed, the group display data editing function is activated

Fig. 6-24

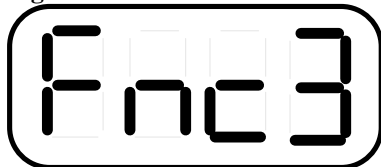
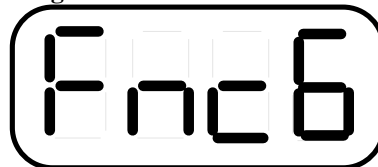



Fig. 6-25



**(3) Displaying the group display number**

The group display number is shown on the monitor.





Input the group display number within the setting range shown in the table below, and

then press the  key.


Type of panel ROM	Setting range
HN58C65P	01-02
HN58C256P	01-40
AH-3000	01-08


The group display data is shown on the monitor.


Data can be input for the highlighted item.

Use the  and  keys to move the highlighting to the data to be changed, and input the data using the  to  keys.

#### (4) Entering the group display data

After the input of all the data is completed, press the  key. The group display data being edited is entered into the panel ROM, and operation returns to the input of the group display number in (3).

If the  key is pressed, group display data editing is aborted, and operation returns to (3). (The data is not entered into the panel ROM.)

If the  key is pressed, group display data editing is aborted, and operation returns to direct display.

**Notes:** A program number setting among those listed below is treated as disabled during group display and skipped during execution.

Program No.000

No.41 and above for the HN58C65P panel ROM

No.41-500, No.541-600, No.641-700, No.741 and above for the HN58C256P panel ROM

When a disabled program No. has been set

## 6-10 Auto display data editing function (FUNC1)


### (1) Concerning auto display data editing


This function prepares the data for executing auto display.

### (2) To activate the auto display data editing function

Execute direct display, and check that patterns are output properly to the analog monitor.

- ◆ The auto display data editing function cannot be executed on a TTL monitor.

If the  key on the RB-649 is pressed, the characters shown in Fig. 6-26 appear on the

LED display. If the  key is then pressed, the characters shown in Fig. 6-27 appear on




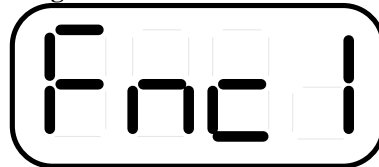
the LED display. If the  key is now pressed, the auto display data editing function is activated.

Fig. 6-26







Fig. 6-27





**(3) Displaying the auto display**

The auto display data is shown on the monitor. Data can be input for the highlighted item.

Use the  and  keys to move the highlighting to the data to be changed, and input the data using the  to  keys.

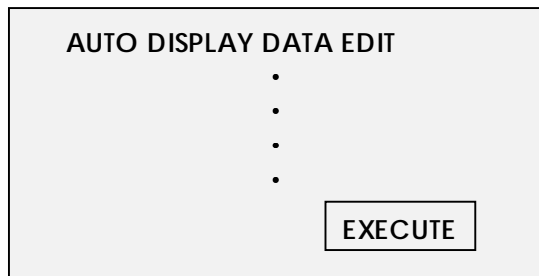
**(4) Entering the auto display data**


After the input of all the data is completed, press the  key. The auto display data being edited is entered into the panel ROM.


If the  key is pressed, auto display data editing is aborted, and operation returns to direct display.

**(5) Executing the auto display data**

The auto display data displayed is executed.  
On the monitor:



Move to the item indicated as "EXECUTE" and press the  key. Auto display is now

executed. To stop auto display during execution, press the  key.

# CHAPTER 7 SELF-DIAGNOSIS MODE

The VG-823's self-check function is designed to check the various devices employed by the VG-823.

## 7-1 Operation method

- (1) Turn on the generator's power while holding down the **INC** key.
- (2) After the buzzer has sounded, all the LEDs will light for 2 seconds.
- (3) After the 2 seconds have elapsed, the buzzer sounds again, and the devices are checked in the following sequence.

7-segment LED display	Device checked	7-segment LED display	Device checked
	CPU WORK RAM		VIDEO RAM1 (circuit for generating circles, etc.)
	H SYNC RAM (circuit for generating H timing data)		VIDEO RAM2 (circuit for generating circles, etc.)
	V SYNC RAM (circuit for generating V timing data)		I/O
	H COLOR RAM (circuit for generating color bars)		Install panel ROM and press <b>SET</b> key.
	H LINE RAM (circuit for generating crosshatch patterns)		Panel ROM
	V COLOR RAM (circuit for generating color bars)		CLOCK (circuit for generating clock signals)
	V LINE RAM (circuit for generating crosshatch patterns)		LUT (D/A converter, etc.)

When a self-check error is discovered, an error code appears on the 7-segment LED display. After checking the error code, press the **SET** key to continue the self-check.







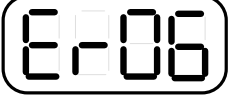

The self-check is completed when appears on the 7-segment display. Turn off the

VG-823's power, turn it back on again, and proceed with operation.

# CHAPTER 8 MAIN SPECIFICATIONS

## 8-1 Error messages

When the buzzer sounds while the VG-823 is operating and an error message from ER00 to ER07 is displayed, the corresponding action described below must be taken to remedy the error.

7-segment LED display		Device checked
(1)		<p>This error results when the panel ROM has not been installed in the panel ROM socket or when a program has not been entered. Check the data on the panel ROM.</p> <p><b>Note:</b> This error displayed is omitted in a mode using the internal sample timing data.</p>
(2)		<p>This error results when the number of the program which is to be run has been set to "Disable." Change the setting of that program No. to "Enable."</p> <p><b>Note:</b> "Disable" is set to prohibit the use of a particular program No. inside the panel ROM.</p>
(3)		<p>This error results when the dot clock is not within the range of 5.00 MHz dot clock = 250.00 MHz.</p> <p>Change the setting.</p>
(4)		<p>This error results when the correct data has not been set in the horizontal or vertical timing data.</p> <p>Check the data entered and change the settings.</p>
(5)		<p>This error results when the correct data has not been set in the output condition data or pattern data.</p> <p>Check the data entered and change the settings.</p>
(6)		<p>This is a setting range error for the H blanking data.</p> <p>Check that the H blanking data is within the setting range of the timing data in Section 6-5-6.</p>
(7)		<p>This is a setting range error for the H front porch data.</p> <p>Check that the H frontp data is within the setting range of the timing data in Section 6-5-6.</p>
(8)		<p>This is a setting range error for the H back porch data.</p> <p>Check that the H backp data is within the setting range of the timing data in Section 6-5-6.</p>

## 8-2 Internal sample timing data tables

Program No.	Horizontal frequency (KHz)	Vertical frequency (Hz)	DOT CLOCK (MHz)	Display dot count (H x V)	Timing data name
01	31.47	70.08	25.17	640 x 350	VGA350
02	31.47	70.08	25.17	640 x 400	VGA400
03	31.47	59.94	25.17	640 x 480	VGA480
04	48.08	72.19	50.00	800 x 600	S - VGA
05	35.52	86.96	44.90	1024 x 768	8514A
06	37.88	83.43	31.51	640 x 400	VESA400
07	37.88	72.84	31.51	640 x 480	VESA480
08	35.16	56.26	36.00	800 x 600	VESA600A
09	37.88	60.32	40.00	800 x 600	VESA600B
10	48.08	72.19	50.00	800 x 600	VESA600C
11	48.38	60.02	65.01	1024 x 768	VESA768A
12	56.47	70.06	75.00	1024 x 768	VESA768B
13	35.00	66.67	30.24	640 x 480	MAC2
14	48.83	66.89	50.00	800 x 600	MAC
15	48.78	59.56	64.00	1024 x 768	S - MAC
16	68.68	75.06	100.00	1152 x 870	QUADRA
17	24.82	56.41	21.05	640 x 400	PC98
18	32.86	79.86	47.84	1120 x 750	PC98XL
19	56.47	70.06	75.00	1024 x 768	98MATE/A
20	50.03	60.05	78.43	1120 x 750	98MATE/B
21	26.38	59.95	22.79	640 x 400	FMR50
22	29.58	36.56	24.02	640 x 377	IBM5550
23	61.80	65.96	92.94	1152 x 900	SPARC/A
24	71.74	76.07	105.59	1150 x 900	SPARC/B
25	81.10	76.08	135.00	1280 x 1024	SS2GT
26	64.64	59.93	107.50	1280 x 1024	EWS4800
27	63.37	60.01	107.50	1280 x 1024	NEWS
28	54.00	60.00	69.12	1024 x 864	VAX/A
29	70.67	66.48	119.84	1280 x 1024	VAX/B
30	48.47	59.62	64.00	1024 x 768	INDIGO/A
31	77.04	72.41	130.00	1280 x 1024	INDIGO/B
32	63.90	60.00	107.35	1280 x 1024	IRIS4D
33	63.33	59.97	108.17	1280 x 1024	HP9000/A
34	78.13	72.00	135.00	1280 x 1024	HP9000/B
35	75.00	60.00	162.00	1600 x 1200	VESA60Hz
36	87.50	70.00	189.00	1600 x 1200	VESA70Hz
37	100.00	80.00	216.00	1600 x 1200	VESA80Hz
38	15.73	59.94	12.65	664 x 484	NTSC
39	15.63	50.00	14.50	756 x 574	PAL
40	33.75	60.00	74.25	1920 x 1034	HDTV

## 8-3 Ratings and accessories

### 8-3-1 Specifications

Dot clock frequency	Analog: 5.00 to 250.00 MHz (25 ppm) TTL: 5.00 to 60.00 MHz (25 ppm)
Horizontal frequency	10 to 130 KHz Max. 8192 dots
Number of vertical scanning lines	Max. 8192 lines
Video memory	4096 dots x 2048 dots
Video signal output level	0.30V to 1.20V +/-0.05V
Sync signal output level (HS/VS/CS)	More than 2V (75 ohms)
Equalizing pulse	ON/OFF selectable
Serrated pulse	OFF/0.5H/1H/XOR selectable
Composite video sync signal	ON/OFF selectable each for R/G/B
Scanning	Non-interlace, interlace & sync, interlace & video
Analog outputs (BNC)	R, G, B, HS, VS, CS (TTL drive possible for HS, VS, CS)
Analog output fine adjustment (trimmers)	Offset level (RGB together), video level (R/G/B separately)
TTL output (57 types, 24 pins)	R, G, B, RHT, GHT, BHT, HS, VS, CS, HD, VD, CLK
Output control	R/G/B, RHT/GHT/BHT, ON/OFF and inverse HS, VS, CS ON/OFF and negative/positive HD, VD, CLK negative/positive
External interface	Remote connector (25-pin) RS-232C (9-pin)

### 8-3-2 Ratings

Supply voltage	AC 90 to 250V
Power line frequency	50 Hz/60 Hz
Power consumption	80VA max.
Dimensions	295(W) x 74(H) x 210(D) mm (excluding protrusions)
Weight	3.5 kg
Operating temperature	5 to 40°C
Storage temperature	-10 to 60°C
Humidity	30 to 90% (no condensation)

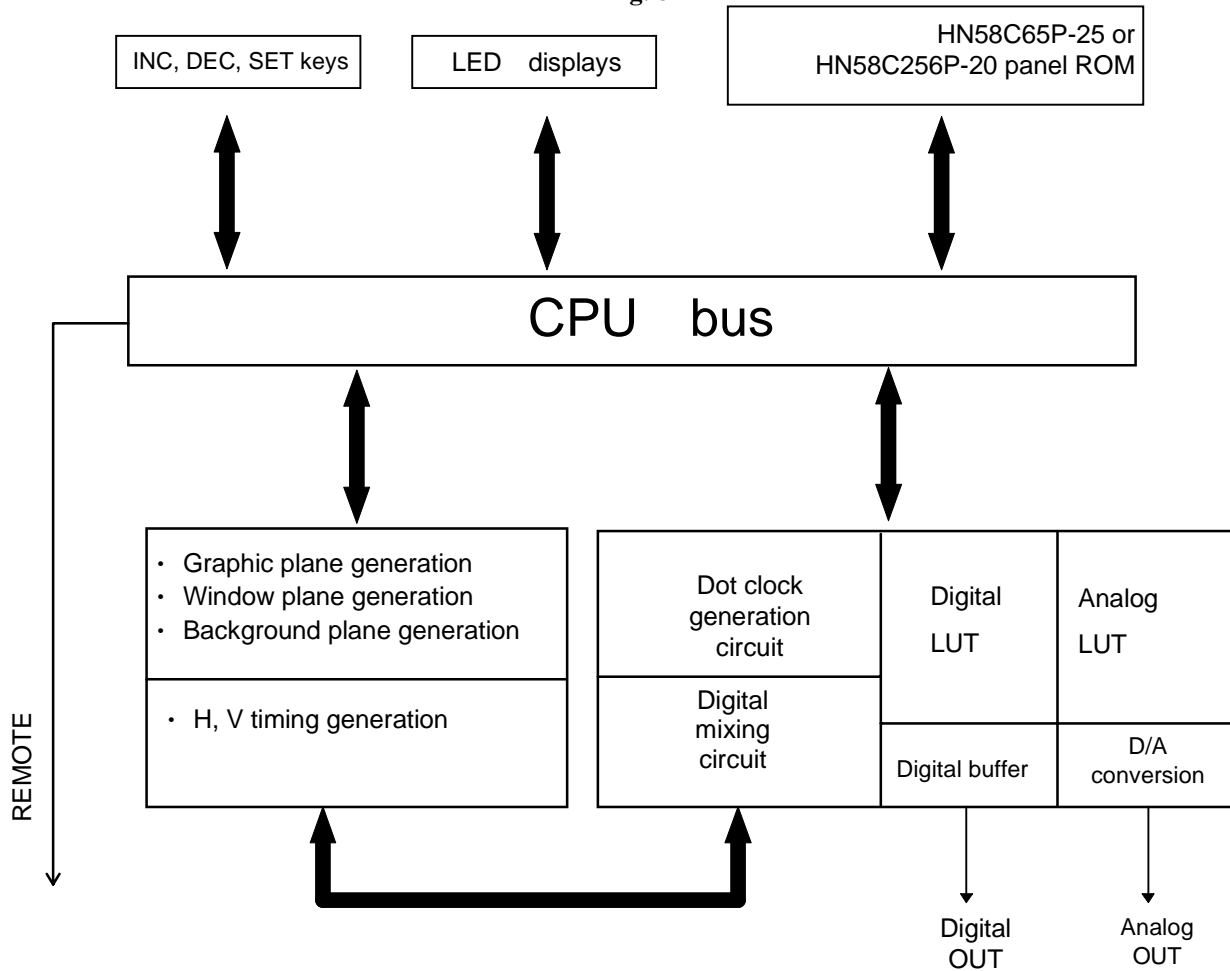
### 8-3-3 Accessories

Instruction manual		1
AC cable		1
FC cable		1
Panel ROM	( HN58C65P-25 )	1
	( HN58C256P-20 )	1
Slow-acting 2A fuse		2

## 8-4 Block diagram and circuit diagrams

### 8-4-1 Hardware block diagram

Fig. 8-1



### 8-4-2 Output circuits

Fig. 0-2 \* Analog R,G,B

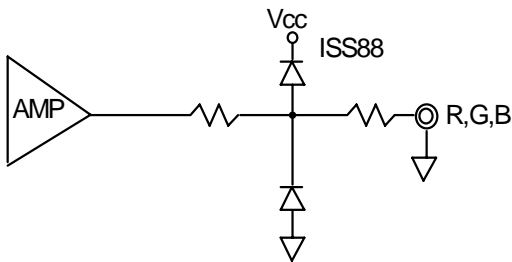
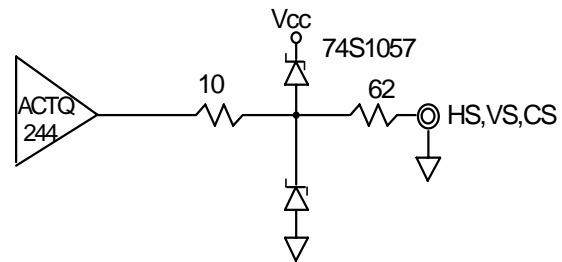


Fig. 0-3 \* Analog HS,VS,CS



TTL OUT

Fig. 0-4 \* Signal OUT

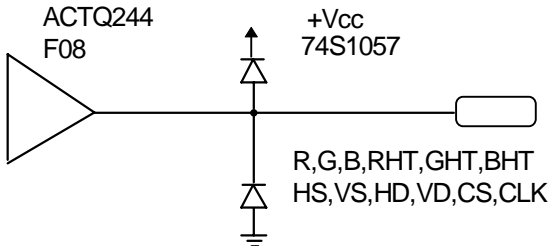
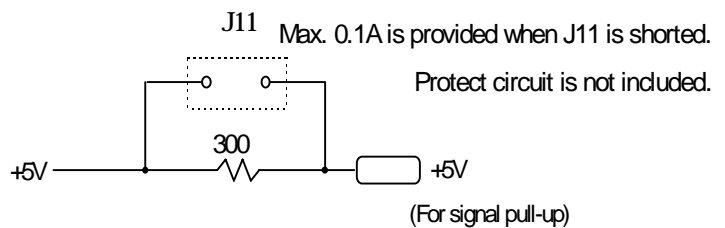


Fig. 0-5 \* +5V



\* Circuits are subject to change without prior notice due to improvements in their performance.

## 8-5 Connector pin layouts

\* TTL connector (57 series of 24-pin connectors)

**Table 7-1**

Pin No.	Signal	Pin No.	Signal
1	R	13	GND
2	G	14	GND
3	B	15	GND
4	RHT	16	GND
5	GHT	17	GND
6	BHT	18	GND
7	HS	19	GND
8	VS	20	GND
9	HD	21	GND
10	VD	22	GND
11	CS	23	GND
12	CLK	24	+5V

Significance of signals	
R	Video signal, red
G	Video signal, green
B	Video signal, blue
RHT	Half-tone signal, red
GHT	Half-tone signal, green
BHT	Half-tone signal, blue
HS	Vertical sync signal
VS	Vertical drive signal
HD	Horizontal drive signal
VD	Vertical drive signal
CS	Composite sync signal
CLK	Dot clock

**Note:** TTL: R/G/B, RHT/GHT/BHT and CLK = Max. 60.0 MHz

\* Remote connector

**Table 7-2**

Pin No.	Signal	Pin No.	Signal
1	KX7	14	KX6
2	KY2	15	KY3
3	KY4	16	KY1
4	KY5	17	Kx4
5	KX5	18	KY0
6	KX3	19	KX2
7	KX1	20	KX0
8	GND	21	GND
9	*1 In use	22	*1 In use
10	*1 In use	23	+5V
11	GND	24	GND
12	*1 In use	25	+5V
13	*1 In use		

\* RS-232C connector

**Table 7-3**

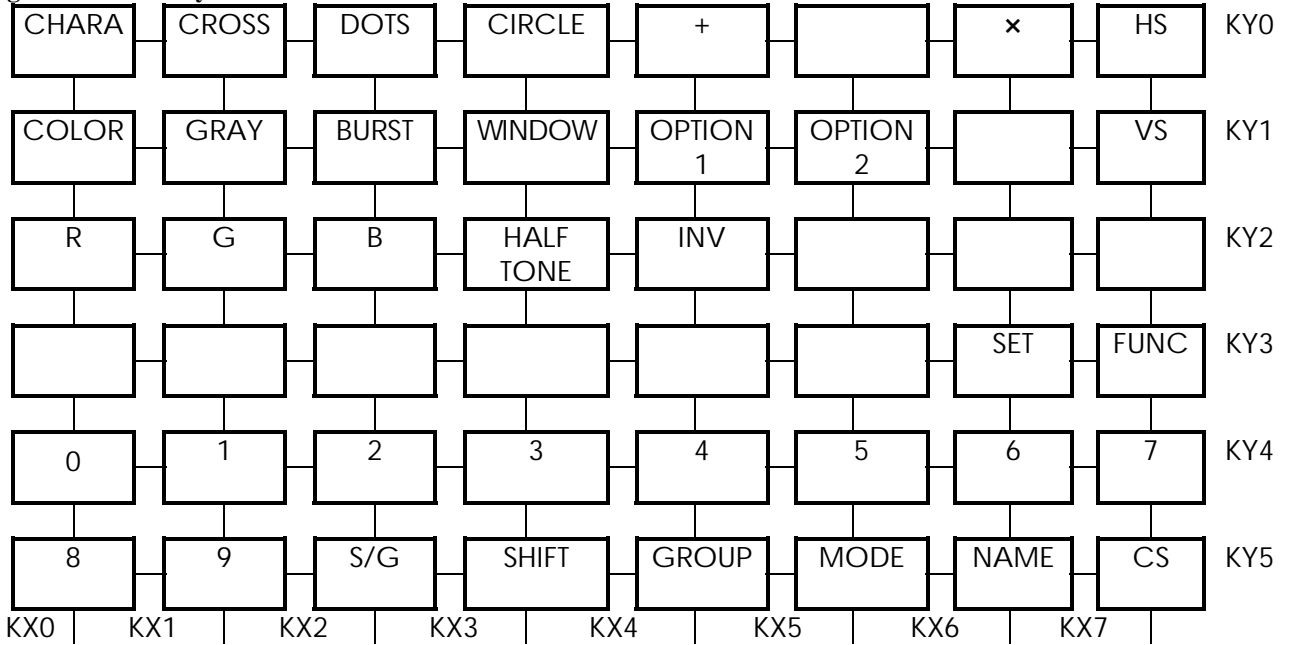
VG-822	
Pin No.	Signal
2	TXD transmitted data
3	RXD received data
5	FG frame ground
7	CTS clear to send
8	RTS request to send

\*1: Under no circumstances should this pin be connected since it is being used by Astrodesign.

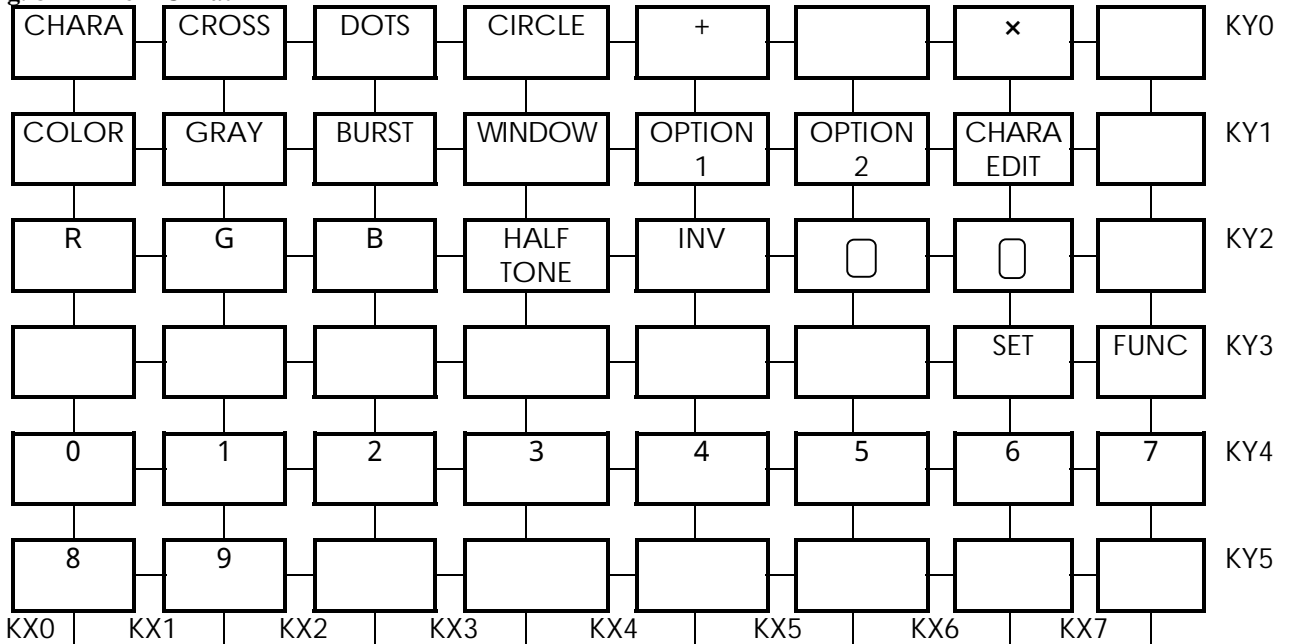


As shown in the figure below, the signals and remote control box (RB-649 or RB-614C: option) key contacts are arranged in the form of a matrix.

**Fig. 8-6 RB-649 key matrix**

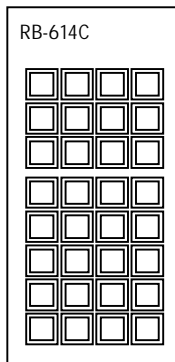


**Fig. 8-7 RB-614C matrix**



## 8-6 Optional accessories

RB-614C remote control box



This is the remote control box for the VG-823. Connecting this box to the VG-823 enables program numbers to be called directly, the character, dot, crosshatch and other patterns to be set ON/OFF, and the RGB signals to be set ON/OFF.

The box can also be used for the VG-812, 813, 814, 815, 819, 822, 829, 825 and 826 units.

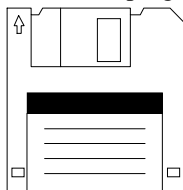
AH-3000 expansion panel ROM



- Main unit, operating instructions

This has 8 times the capacity of a conventional EEPROM, and it can accommodate the data in up to 320 programs.

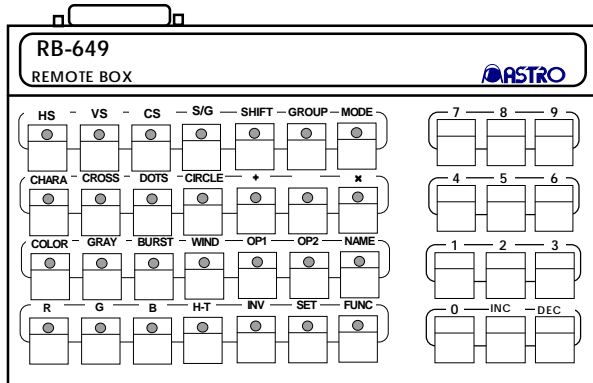
SP-8000 series program editing software



Operating instructions, floppy disk, license agreement

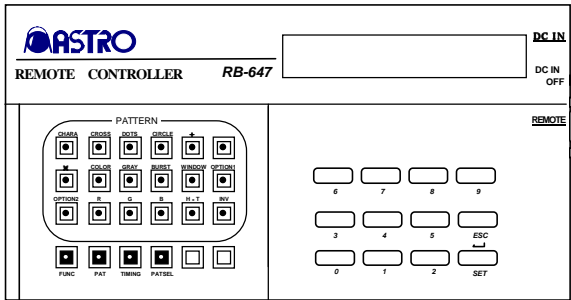
This enables the timing and pattern data to be edited on a personal computer and the programs to be entered in the panel ROM.

RB-649 remote control box



This remote control box is designed exclusively to be used with the VG-822 or VG-823. When it is connected, functions such as program data editing and entry and character editing can be executed in addition to the functions of the RB-614C listed above.

RB-647 operation box



Main unit, operating instructions

Besides providing such functions as calling program numbers directly and setting the patterns ON/OFF, this box enables the panel ROM data to be edited.

It comes with an LCD display for added convenience in remote operations.



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## 8.7 Character codes

(5x7) Character pattern table 1

20H 	21H 	22H 	23H 	24H 	25H 	26H 	27H 
28H 	29H 	2AH 	2BH 	2CH 	2DH 	2EH 	2FH 
30H 	31H 	32H 	33H 	34H 	35H 	36H 	37H 
38H 	39H 	3AH 	3BH 	3CH 	3DH 	3EH 	3FH 
40H 	41H 	42H 	43H 	44H 	45H 	46H 	47H 
48H 	49H 	4AH 	4BH 	4CH 	4DH 	4EH 	4FH 
50H 	51H 	52H 	53H 	54H 	55H 	56H 	57H 
58H 	59H 	5AH 	5BH 	5CH 	5DH 	5EH 	5FH 
60H 	61H 	62H 	63H 	64H 	65H 	66H 	67H 
68H 	69H 	6AH 	6BH 	6CH 	6DH 	6EH 	6FH 
70H 	71H 	72H 	73H 	74H 	75H 	76H 	77H 
78H 	79H 	7AH 	7BH 	7CH 	7DH 	7EH 	7FH 

(5x7) Character pattern table 2

80H	81H	82H	83H	84H	85H	86H	87H
88H	89H	8AH	8BH	8CH	8DH	8EH	8FH
90H	91H	92H	93H	94H	95H	96H	97H
98H	99H	9AH	9BH	9CH	9DH	9EH	9FH
A0H	A1H	A2H	A3H	A4H	A5H	A6H	A7H
A8H	A9H	AAH	ABH	ACH	ADH	AEH	AFH
B0H	B1H	B2H	B3H	B4H	B5H	B6H	B7H
B8H	B9H	BAH	BBH	BCH	BDH	BEH	BFH
C0H	C1H	C2H	C3H	C4H	C5H	C6H	C7H
C8H	C9H	CAH	CBH	CCH	CDH	CEH	CFH
D0H	D1H	D2H	D3H	D4H	D5H	D6H	D7H
D8H	D9H	DAH	DBH	DCH	DDH	DEH	DFH

(7x9) Character pattern table 1

20H	21H	22H	23H	24H	25H	26H	27H
28H	29H	2AH	2BH	2CH	2DH	2EH	2FH
30H	31H	32H	33H	34H	35H	36H	37H
38H	39H	3AH	3BH	3CH	3DH	3EH	3FH
40H	41H	42H	43H	44H	45H	46H	47H
48H	49H	4AH	4BH	4CH	4DH	4EH	4FH
50H	51H	52H	53H	54H	55H	56H	57H
58H	59H	5AH	5BH	5CH	5DH	5EH	5FH
60H	61H	62H	63H	64H	65H	66H	67H
68H	69H	6AH	6BH	6CH	6DH	6EH	6FH
70H	71H	72H	73H	74H	75H	76H	77H
78H	79H	7AH	7BH	7CH	7DH	7EH	7FH

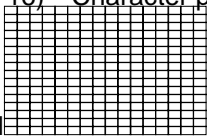
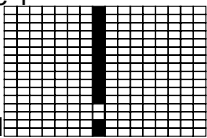
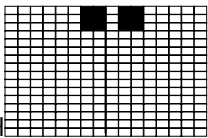
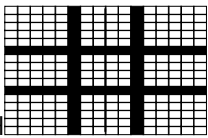
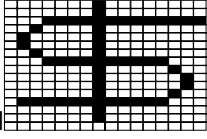
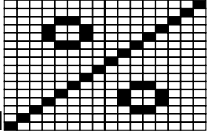
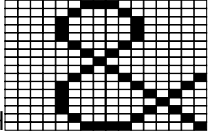
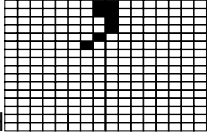
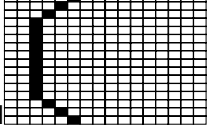
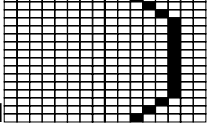
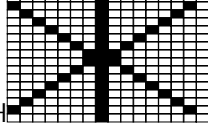
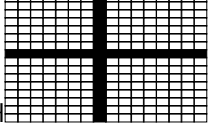
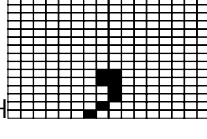
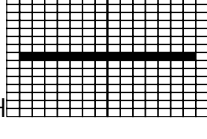
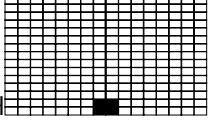
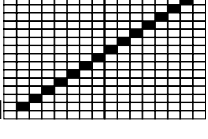
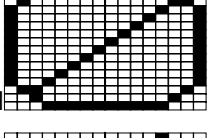
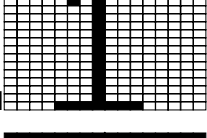
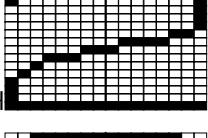
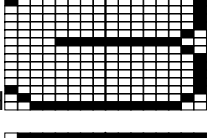
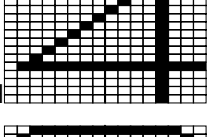


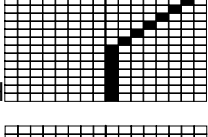
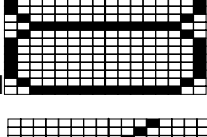
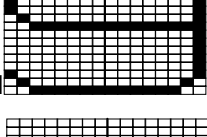
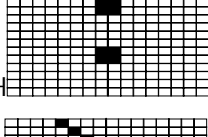
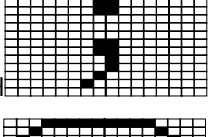
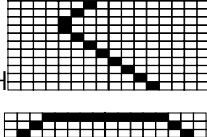
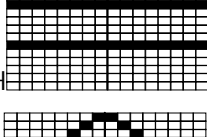
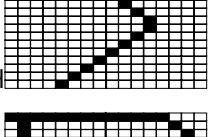
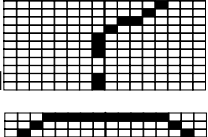
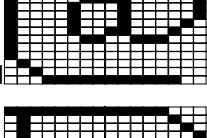

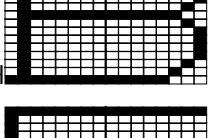
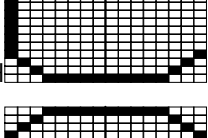
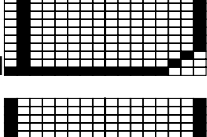
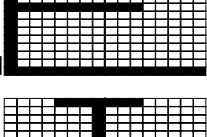
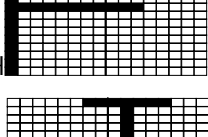
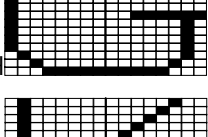
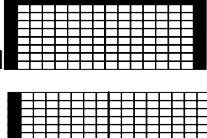
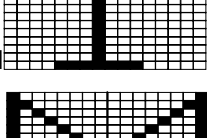
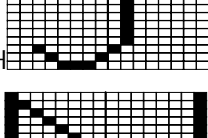
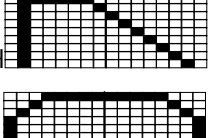

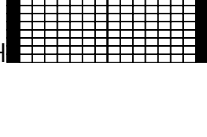
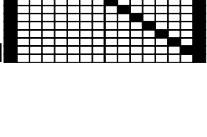
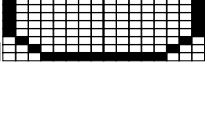


(7x9) Character pattern table 2

\* Character codes 80H to 8FH consist of 8x9 dot displays.

80H	81H	82H	83H	84H	85H	86H	87H
88H	89H	8AH	8BH	8CH	8DH	8EH	8FH
90H	91H	92H	93H	94H	95H	96H	97H
98H	99H	9AH	9BH	9CH	9DH	9EH	9FH
A0H	A1H	A2H	A3H	A4H	A5H	A6H	A7H
A8H	A9H	AAH	ABH	ACH	ADH	AEH	AFH
B0H	B1H	B2H	B3H	B4H	B5H	B6H	B7H
B8H	B9H	BAH	BBH	BCH	BDH	BEH	BFH
C0H	C1H	C2H	C3H	C4H	C5H	C6H	C7H
C8H	C9H	CAH	CBH	CCH	CDH	CEH	CFH
D0H	D1H	D2H	D3H	D4H	D5H	D6H	D7H
D8H	D9H	DAH	DBH	DCH	DDH	DEH	DFH

(16 x 16) Character pattern table 1

			
20H	21H	22H	23H
			
24H	25H	26H	27H
			
28H	29H	2AH	2BH
			
2CH	2DH	2EH	2FH
			
30H	31H	32H	33H
			
34H	35H	36H	37H
			
38H	39H	3AH	3BH
			
3CH	3DH	3EH	3FH
			
40H	41H	42H	43H
			
44H	45H	46H	47H
			
48H	49H	4AH	4BH
			
4CH	4DH	4EH	4FH

(16 x 16) Character pattern table 2

50H	51H	52H	53H
54H	55H	56H	57H
58H	59H	5AH	5BH
5CH	5DH	5EH	5FH
60H	61H	62H	63H
64H	65H	66H	67H
68H	69H	6AH	6BH
6CH	6DH	6EH	6FH
70H	71H	72H	73H
74H	75H	76H	77H
78H	79H	7AH	7BH
7CH	7DH	7EH	7FH

(16 x 16) Character pattern table 3

80H		81H		82H		83H	
84H		85H		86H		87H	
88H		89H		8AH		8BH	
8CH		8DH		8EH		8FH	
90H		91H		92H		93H	
94H		95H		96H		97H	
98H		99H		9AH		9BH	
9CH		9DH		9EH		9FH	
A0H		A1H		A2H		A3H	
A4H		A5H		A6H		A7H	
A8H		A9H		AAH		ABH	
ACH		ADH		AEH		AFH	

(16 x 16) Character pattern table 4

B0H	B1H	B2H	B3H
B4H	B5H	B6H	B7H
B8H	B9H	BAH	BBH
BCH	BDH	BEH	BFH
C0H	C1H	C2H	C3H
C4H	C5H	C6H	C7H
C8H	C9H	CAH	CBH
CCH	CDH	CEH	CFH
D0H	D1H	D2H	D3H
D4H	D5H	D6H	D7H
D8H	D9H	DAH	DBH
DCH	DDH	DEH	DFH