



Virtual Studio / RCG System  
**digiStorm** Powered by Brainstorm



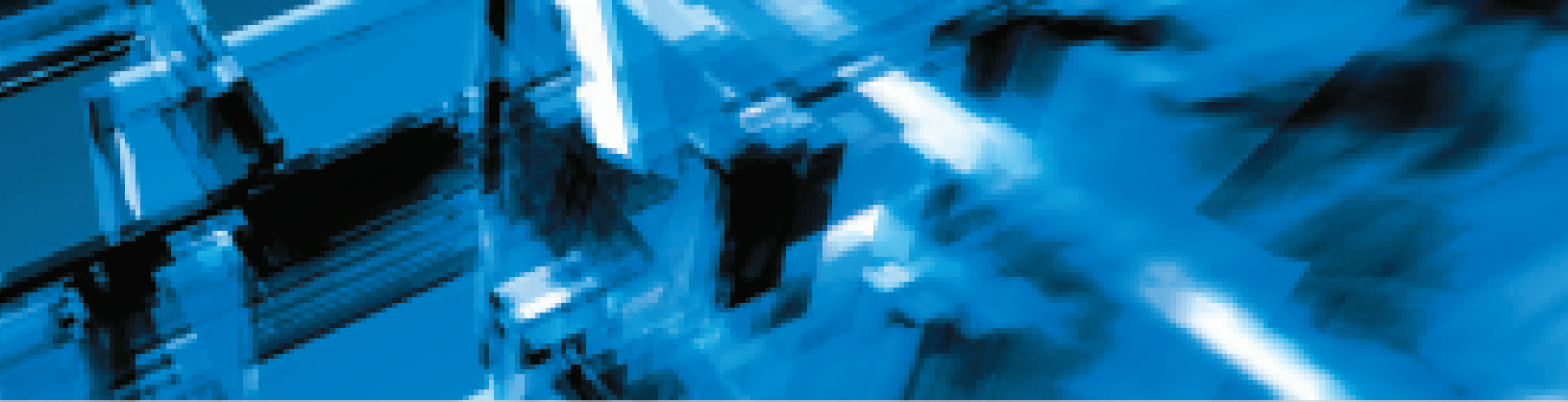
**Virtual Studio / RCG System**

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**Broadcast Graphics Solution**



## ■ digiStorm: An exciting creation of the combined expertise of FOR-A and Brainstorm

digiStorm =FOR-A Hardware + Brainstorm Software

"digiStorm" is the state-of -the art on-air graphics solution created by the joint development efforts of FOR-A and Brainstorm Multimedia. When the technological resources of FOR-A, a hardware manufacturer and virtual studio integrator, and Brainstorm's eStudio, a virtual studio software program which has been well-established throughout the world, are fused together, the resulting synergy effect opens up a world of "broadcast graphics". Through this new and exciting on-air graphics solution, immediate form is instantly given to the powers of creative imagination.



## ■ The digiStorm Advantage

Offered by FOR-A and Brainstorm Multimedia, digiStorm is a system solution providing numerous features for smooth operation of broadcast graphics and virtual studios. The hardware design is based on FOR-A's accumulated technology and extensive expertise in the system integration field. A number of software packages are also provided to facilitate setup and operation.

With digiStorm, operation processes become simpler. Some of the key technologies used in digiStorm are presented here.

### ■ Key software

#### **Brainstorm eStudio:**

The ultimate on-air graphics software with superior rendering capability

#### **Brainstorm Easyset3D:**

Software that enables easy operation of virtual studios

### ■ Operation support

#### **IfCalibSTD Camera calibration software:**

A powerful support tool that performs lens calibrations essential for operation

#### **Brainstorm Controller System operation software:**

Creates transmission/event lists and performs data linkup using ODBC/CSV

### ■ Creation support

#### **Data Converter Data conversion software:**

Converts data from 3D graphics software, Excel, PowerPoint, and other applications

### ■ Linkage with studio sub-control systems

#### **System linkage with HANABI:**

Enables seamless virtual studio/RCG operation

### ■ Consolidation of system equipment

#### **Chroma keyer VRP series:**

Chroma keys and other system equipment needed for operation are centralized into a single device.

### ■ Efficient usage of equipment

#### **DSC-100/200 digiStorm controller:**

Traffic center for various types of data in the virtual system

## ■ About Brainstorm Multimedia



Excerpt from <http://www.brainstorm.es>

Brainstorm has been a pioneering company in providing real time 3D graphics solutions for the broadcast industry.

Brainstorm is a software development company with over 15 year's experience of 3D graphics and presentation within the broadcast television and multimedia industries. Our software has been developed due to our need to provide broadcast graphics and 3D services. Through our services division every aspect of the software is tested and used by us for live programs and presentations before being offered to the open market.

Brainstorm was founded in 1993 initially as a services company to provide graphics services for broadcast television stations. At the time bespoke software was not available and traditional hardware was limited in what it could do.

Achieving what the customer needed meant creating custom software, but rather than making a "closed" software that would be difficult to adapt to other work it was developed as an open tool to allow you to create whatever service you need. Soon customers wanted to buy the software themselves for their own use.

Now there are many Brainstorm systems being used all over the world in some of the most highly respected broadcast organisations. We enjoy and are committed to continued development of 3D graphics and the associated technology.

# VRP-70HS/S Chroma keyer / Virtual Processor



This virtual processor accepts the input of images from cameras, and it combines 3-dimensional computer graphics linked to the camera parameters. It is ideal as an HD or SD chroma keyer.

- Up to 16 inputs (8 inputs in standard and additional 8 inputs optional).
- Up to 12 outputs (4 outputs in standard and additional 8 outputs optional).
- Each inputs freely assignable as camera inputs (max 4), CG input (1 each of V and K), and optional Texture inputs (2 each of V and K).
- 4 camera inputs provided. Enables a system configuration using a multiple number of cameras.
- Delay selectable from 0H to 10 frames.
- Chroma key functions based on Primatte® RT/Plus provided.
- Real-time camera switching. Chromakey settings are automatically retained for each camera.
- Using the process amplifier and simple color adjustment functions, the camera input colors can be adjusted to suit the background CG environment color and CG colors can be changed to better fit the presentation to be given.
- DSK functions are provided, and two video textures usable in addition to the chroma key images and CG images.
- 3 internal DSK with 5 layers. Independent layer control for each DSK.
- Each outputs freely assignable as internal DSK (3 each of V and K) and Monitor outputs.
- Genlock input to synchronize external video sources provided. Video and reference output signals adjustable according to the system timing.
- Optional redundant power supply available.

## VRP-RUA Remote Control Unit



Remote control unit enabling centralized control over the VRP series.

Primatte®  
Primatte® is a trademark of IMAGICA Corp.  
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\*VRP-70S : SD only Version is available.

# DSC-100/200 digiStrom Controller



The DSC-100/200 is an interface controller that serves as the traffic center for the wide array of data in the virtual system.

- Enables control of up to 8 sensors with digiStorm and up to 4 sensors with digiWarp-EX II
- Allows building of a multi-sensor camera system based on switching camera information
- Includes RS-422, GPI, and LAN terminals for functioning as an integrated controller in the virtual studio

# HANABI Series Digital Video Switcher



Hanabi SD and HD Digital Video Switchers offer high performance and great functionality in the world's most compact, 2M/E, 4-RU main frame system. 1M/E version is also available.

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# digiStorm System

Virtual Studio / RCG System

FOR-A's digiStorm system makes it possible to realize a 3D virtual studio system and RCG system more effectively, more efficiently, and with higher cost-performance than ever before. For example, whereas one CG processor is required for each camera in a regular virtual studio system, with the digiStorm system, one CG processor can support multiple cameras. FOR-A's long record of experience in video equipment development and system engineering enabled us to develop this system. Its tremendous power for content creation is being realized in broadcast stations, BS/CS stations, CATV stations, schools, and a wide range of other fields.



## ■ Hardware and software behind the digiStorm system

- **Chroma keyer/Virtual processor: VRP-70HS/S**

RCG and virtual studios need a large number of devices for operation such as chroma keyers for video composites and delay lines for correcting video delays. At FOR-A, we have combined the individual functions of these devices into the chroma keyer/virtual processor VRP series. With the VRP series, complex systems can be made with extremely simple configurations.

- **Linkage with HANABI video switcher**

In a RCG or virtual studio, differences occur between a live-action image and CG when switching video with a video switcher. Generally, a preselector must be used at the CG side to compensate for any differences, but now, the FOR-A HANABI video switcher can be used to account for this difference internally when switching video. This enables operation that feels no different from regular switcher operation.

- **Software**

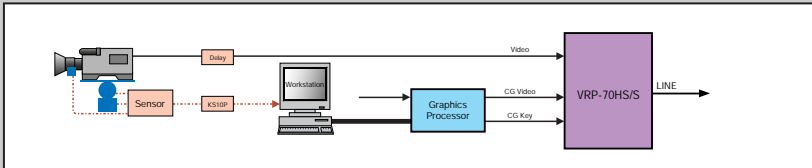
The digiStorm system is equipped with an extensive software package. In addition to the key software Brainstorm eStudio, it includes the IfCalibSTD calibration software, Brainstorm Controller system operation software, Data Converter data conversion software, and other operation support software.

- **digiStorm controller: DSC-100/200**

Normally, in a RCG or virtual studio, one CG processor and one composite processor must be available for each camera. FOR-A's DSC-100/200 digiStorm controller, however, can link to video switcher operation and change the camera parameters input to the CG processor. This enables you to efficiently use CG processors and composite processors during studio operation with multiple cameras.

## System example 1: RCG system

System configuration of one CG processor and one VRP-70HS unit for one camera

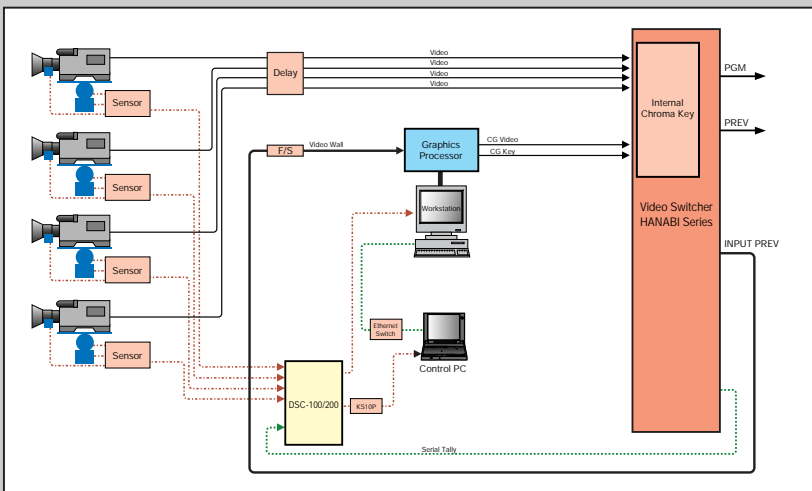


- Can be added to an existing studio and can be used as a site for sports and other remote broadcasts
- Supports wide array of sensors and remote control cameras
- A second VRP-70HS chroma key (option) can be used to perform simultaneous chroma key processing (remove two colors) on, for instance, a green lawn area and brown area with dead grass.

## System example 2: HANABI linkage system

**Multiple cameras, one processor, and HANABI system:**

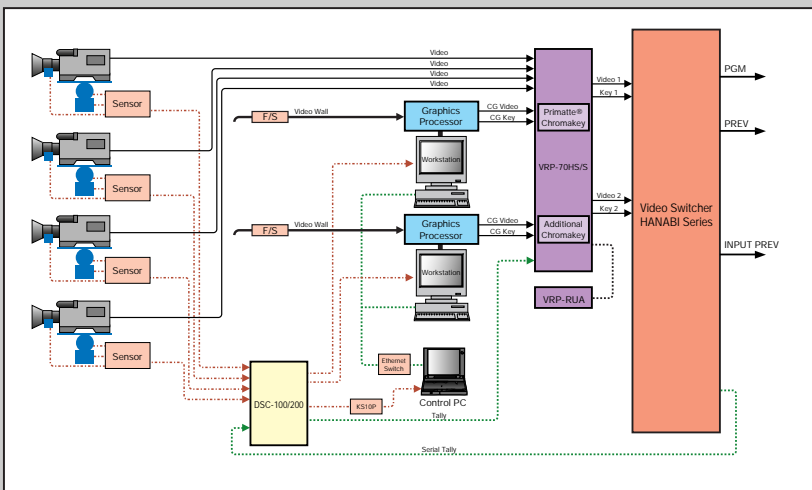
System configuration using one CG processor and HANABI for multiple cameras



- Parameter signals from multiple cameras pass through the DSC-100/200 and are sent to the CG processor. The internal chroma keys and AUX output of the HANABI are linked to the cameras selected by the PGM to enable CG and camera linkage.
- When using a regular switcher, one CG processor is needed for each camera. Therefore, the system on left enables a lower system cost.

**Multiple cameras, one processor, one VRP, and HANABI system:**

System configuration using two CG processor and one VRP-70HS unit for multiple cameras



- Parameter signals from multiple cameras pass through the DSC-100/200 and sent to the CG processor. The VRP-70HS is used to input results combined with CG video to the HANABI video switcher to enable linkage of the camera and CG selected by PGM and PREV.
- The VRP-70HS handles digital delay, chroma keys, and other functions required for system operation.
- Two chroma key channels can be installed in one VRP-70HS unit.
- The VRP-70HS includes a routing function. The user can assign any selected camera video within the device.
- The virtual linkage function in the HANABI digital video switcher enables the building of a smooth operating environment.

\*The composite output with CG video can be checked in the PGM and PREV output.

Other possible system configurations are possible depending on the environment and application. For details, please contact FOR-A.