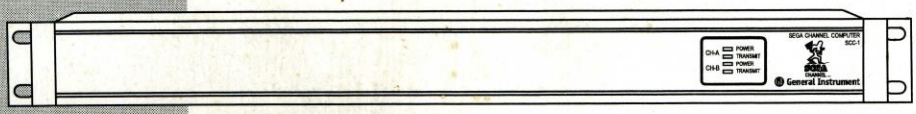
SGS-1
Sega Game Server

SCC-1
Sega Channel Computer

Installation and Operation Manual



General Instrument

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Section 1
Introduction

The General Instrument Sega Channel System provides subscribers with unlimited access to a menu of as many as 50 video games per month. The video games are available 24 hours a day, seven days a week. There are two possible configurations of the Sega Channel System. In the United States, the Sega Channel System is delivered from an uplink configuration, based in Denver, CO. In Canada and other countries, the Sega Channel System is delivered from various local origination systems set up throughout the country.

In an uplink configuration, the Sega Channel[SM/TM] delivery system is comprised of the following components:

- The SGS-1 Sega Game Server which acts as the central data source of the Sega Channel system
- The SCC-1 Sega Channel Computer which encrypts the data received from the SGS-1 and forwards it to the game data multiplexer and additional satellite delivery equipment
- The SSR-1 Sega Channel satellite receiver which processes the data received from the satellite equipment and provides data outputs which are applied to the digital transcoders
- The SST-1 Sega Channel digital transcoder which transmits the Sega Channel signal to the subscriber's home for reception by the Sega Channel Adapter
- The SGT-3000 Sega Channel Adapter which interfaces with the subscriber's own Sega Genesis™ or Sega CDX™ game consoles

In a local origination system, the SCC-1 encrypts the data received from the SGS-1 and forwards it directly to the digital transcoder. The satellite delivery equipment and SSR-1 receiver are not used.

The SGS-1 Sega Game Server and SCC-1 Sega Channel Computer are used at the uplink site or wherever the Sega Channel service is locally originated. The Sega Game Server computer acts as the central data source for the General Instrument implementation of the Sega Channel system. It reads CDs that contain a text format schedule file, game data, and a menu. At the times listed in the schedule file, the game server copies the game data to the Sega Channel Computer, which then transmits the data to the Sega Channel Adapter.

The SGS-1 offers the following features:

- Automatic processing of scheduled data on CD
- Load balancing of game data
- Interleaving of game packets
- Switching of service codes for Play-Per-Day rental games

The SCC-1 offers the following features:

- Formatting of data received from SGS-1
- Adding of tag data and control information
- Encrypting of game data

Using This Manual

This manual includes the information and instructions required to operate the SGS-1 and SCC-1.

Section 1	Includes a brief description of the products, lists related documentation, gives the helpline number, and provides repair return instructions.
Section 2	Provides a brief overview of the SGS-1 and SCC-1.
Section 3	Gives instructions on how to install the SGS-1 and SCC-1.
Section 4	Describes the features of the SGS-1.
Section 5	Describes the features of the SCC-1.
Section 6	Gives instructions on how to configure and operate the SGS-1 via the user interface screens.
Appendix A	Provides the technical specifications of the SGS-1 and SCC-1.

Related Documentation

Separate instruction manuals are available for associated components. Although these may be of interest to you, they are not necessary to install or operate the SGS-1 and SCC-1.

- *Model SST-1 Sega Channel Digital Transcoder Installation and Operations Manual*, part number 437-035-200
- *Model SSR-1 Sega Channel Satellite Receiver Installation and Operations Manual*, part number 436-881-200
- *Sega Channel Adapter, Model SGT-3000, Installation Manual*, part number 437-064-100

If You Need Help

If you need assistance while working with the SGS-1 or SCC-1, call the General Instrument Technical Response Center at **1-800-537-7653**. The Technical Response Center is open 8:00 am to 6:00 pm Eastern Time, Monday through Friday. When the Technical Response Center is closed, emergency service *only* is available on a call-back basis.

When contacting the Technical Response Center from outside the United States, please use our main switchboard number, **1-215-674-4800**. After business hours, please use **1-215-581-9637**.

Calling for Repairs

If repair is necessary, call the General Instrument Repair Facility at **1-800-227-0450** for a Return for Service Authorization (RSA) number before sending the unit. The RSA number must be prominently displayed on all equipment cartons. The Repair Facility is open 8:00 am to 5:00 pm Central Standard Time, Monday through Friday.

If calling from outside the United States, dial your appropriate international access code, then dial **52-891-40739**, to contact the Repair Facility.

When shipping equipment for repair, follow these steps:

1. Pack the unit securely.
2. Enclose a note describing the exact problem.
3. Enclose a copy of the invoice that verifies the warranty status.
4. Ship the unit **PRE-PAID** to the following address:

   GI Communications
   1330 Capital Parkway
   Carrollton, TX 75006
   Attn: RSA #_____

Section 2

System Overview

The Sega Game Server computer acts as the central data source for the General Instrument implementation of the Sega Channel system. It reads compact discs (CDs) that contain the following items:

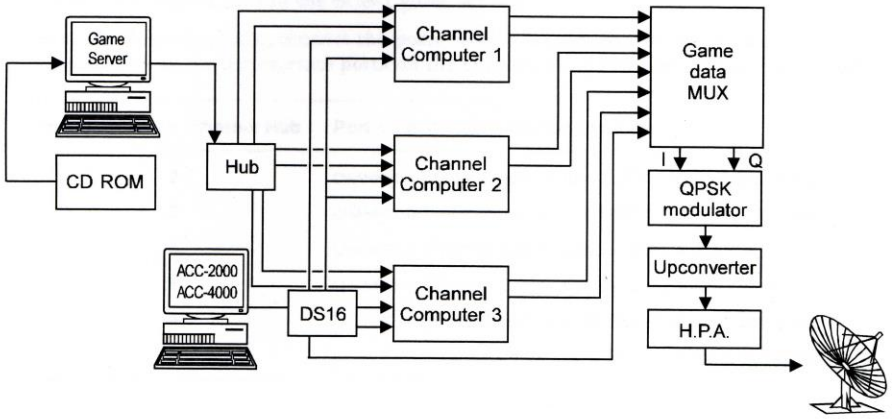
- A text format schedule file
- One or more subdirectories containing game data and the menu (which may or may not be compressed)

At the times listed in the schedule file, the game server copies the contents of the specified subdirectory to its hard disk, then processes this data and sends it to the Sega Channel Computers (SCC). When the last entry of the schedule file has been processed, the game server begins polling the CD-ROM drive every five minutes to look for an updated CD. There is one Sega Channel Computer per delivery channel in the system. The game server and channel computers communicate over a 10 Base-T Ethernet local area network. The game server also provides an optional user interface, which allows for the manual reloading of the channel computers, configuration of the system, and viewing of system parameters and operation.

The channel computer is a rack-mounted unit which contains two small board computers (SBC) which accept processed game data from the Sega Game Server. Each channel computer formats the data and transmits it at an unframed T1 rate, 1.536 Mbit/sec. There is one small board computer per channel.

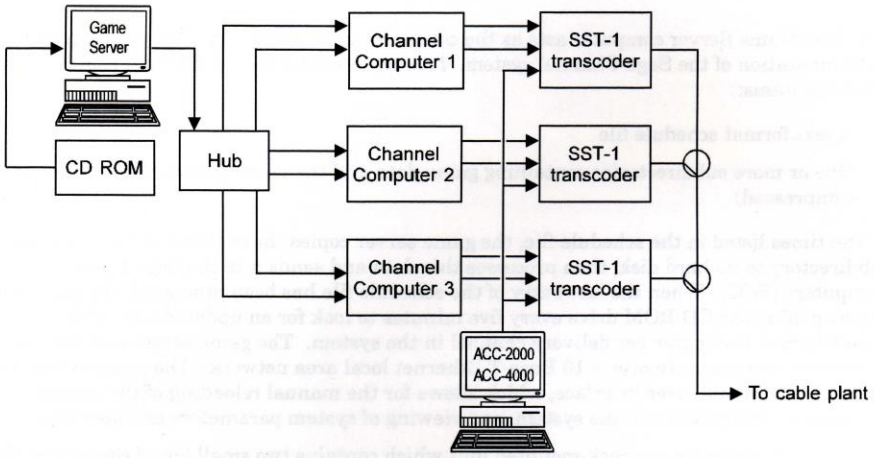
The following figure illustrates the configuration of the Sega Game Server and Sega Channel Computer at the uplink site, as used in the United States.

Figure 1
Uplink site block diagram



The following figure illustrates the configuration of the Sega Game Server and Sega Channel Computer at a local origination site, as currently used in Canada.

Figure 2
Local origination site block diagram



Section 3
Installation

The components of a local origination system are delivered pre-configured. All that remains to be done is to connect the components to each other. Please verify that you have received the following items:

- SGS-1 Sega Game Server
- SCC-1 Sega Channel Computers
- Linksys Ethernet hub
- SST-1 Sega Channel digital transcoders
- RS-530 D-type cables
- Ethernet cables
- Coaxial cables
- Splitter

The quantities of each component will vary with each site.

Follow the steps detailed below to set up your system.

1 Using an RS-530 D-type cable, connect the CHANNEL A port of the first SCC-1 channel computer to the CHANNEL A DATA IN port of the first SST-1 digital transcoder.

2 Using an RS-530 D-type cable, connect the CHANNEL B port of the first SCC-1 to the CHANNEL B DATA IN port of the first SST-1 digital transcoder.

3 Repeat steps 1 and 2 for the second and third channel computers and digital transcoders.

4 Using an Ethernet cable, connect the port labeled 1 on the back of the Linksys Ethernet hub to the Ethernet card in the SGS-1 game server.

5 Using the following table, connect the ports labeled 2 through 7 on the back of the Linksys Ethernet hub to the appropriate ports on the channel computers using Ethernet cables:

Port Number on Ethernet Hub	Port on SCC-1 Channel Computer
2	CHANNEL A Ethernet port on first SSC-1 channel computer.
3	CHANNEL B Ethernet port on first SSC-1 channel computer.
4	CHANNEL A Ethernet port on second SSC-1 channel computer.
5	CHANNEL B Ethernet port on second SSC-1 channel computer.
6	CHANNEL A Ethernet port on third SSC-1 channel computer.
7	CHANNEL B Ethernet port on third SSC-1 channel computer.

6 Using coaxial cable, connect the RF OUT ports on the SST-1 digital transcoders to either a 3-way or 4-way splitter. If using a 4-way splitter, the unused port must be terminated with a 75-Ohm terminator.

7 Using coaxial cable, connect the CONTROL DATA LOOP THROUGH OUT port on the first SST-1 to the CONTROL DATA LOOP THROUGH IN port of the second SST-1.

8 Using coaxial cable, connect the CONTROL DATA LOOP THROUGH OUT port on the second SST-1 to the CONTROL DATA LOOP THROUGH IN port of the third SST-1.

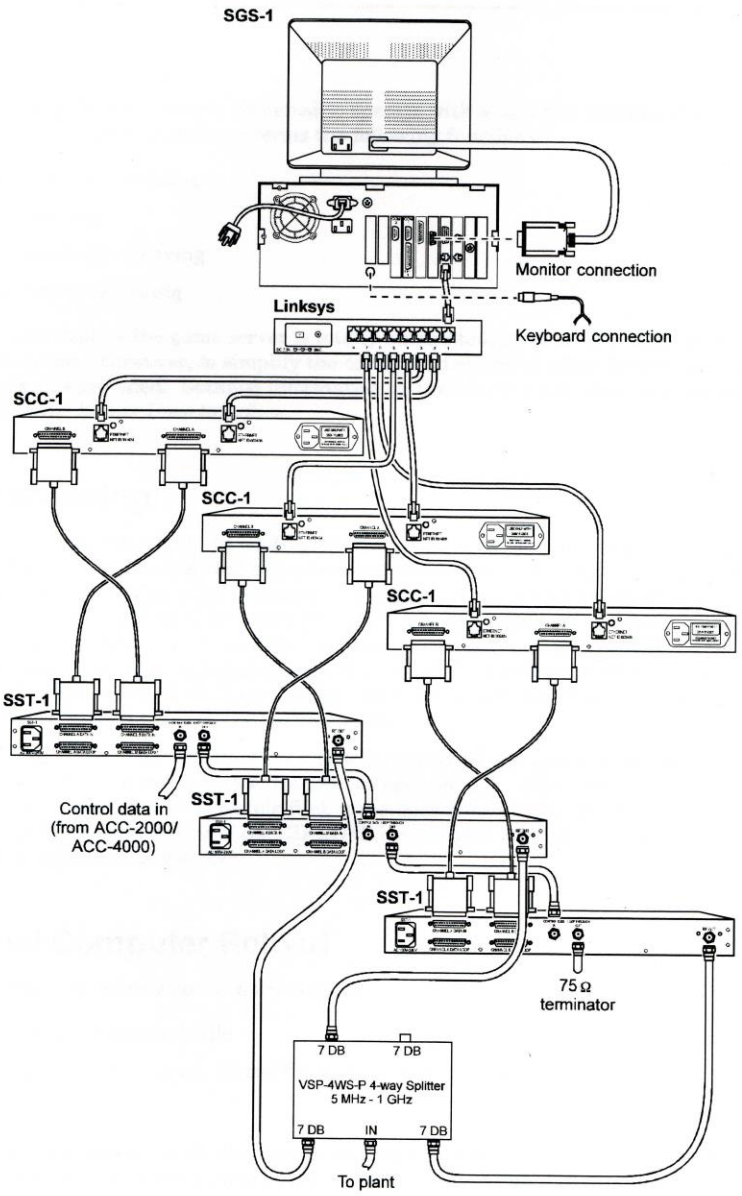
9 Terminate the CONTROL DATA LOOP THROUGH OUT port on the third SST-1 with a 75-Ohm terminator.

10 Using coaxial cable, connect the CONTROL DATA LOOP THROUGH IN port on the first SST-1 to the ACC-2000 or ACC-4000, whichever is being used in the system configuration.

11 Connect the splitter to the plant.

Figure 3 on the following page displays the proper wiring configuration for a local origination system.

Figure 3
Sample wiring configuration



Section 4

Features of the SGS-1

The SGS-1 Sega Game Server is designed to operate with a minimal amount of user intervention. It automatically performs the following functions:

- Automatic CD processing
- Load balancing
- Game packet interleaving
- Service codes switching

Since the operation of the game server is totally automated, no user intervention is required for normal operation. However, to simplify the configuration and to allow for status checking, a user interface is provided. Detailed information on the server's user interface can be found in *Section 6, Game Server User Interface*.

CD Processing

When a new CD is required to be loaded, all that needs to be done is to replace the old CD with the new CD. The mechanism that allows the automatic operation is the schedule file on the CD. This text file contains a list of date/time stamps and associated subdirectory names. At the specified dates and times, the corresponding CD subdirectory will be copied to the server's hard disk data subdirectory, overwriting the data that was previously present. This data is then processed. This copying generally takes three to five minutes for 65 MB of data, using a 2X speed CD-ROM drive. The CD will not be read again until the next entry in the schedule file, or when requested through the user interface.

When the last entry of the schedule file has been processed, the game server begins polling the CD-ROM drive every five minutes to look for an updated CD. When the server detects the new CD (by the presence of a new schedule file), it resumes normal schedule file processing. If at any time the CD is removed (or if the CD-ROM drive should fail), the server polls the CD-ROM drive until a valid disk is detected.

Channel Computer Reload

Channel computer reloads occur in three cases:

- According to the schedule file
- When manually requested, through use of the server's user interface
- On power up

On power up, the server checks the state of the channel computers. If any of the SCCs have no memory contents, the server automatically reloads all the channel computers.

Once the new game data is copied from a subdirectory on the CD to the server's hard disk, the server must process the data. This processing guarantees the following:

- The download time requirements are met for both the menu and the individual games, regardless of which channel the adapter is tuned to
- The data is reliably sent to the channel computers for cyclic transmission

The processing that takes place is split into two main functions: load balancing and game packet interleaving.

Load Balancing

The load balancing step of the game data processing attempts to balance out the load on each of the channels of the system. It also includes the menu on each channel as many times as necessary to ensure it can be downloaded in the required time (20 seconds, although this is configurable). Note that this download time has a noticeable effect on the overall average download time on each of the channels in the system.

Game Packet Interleaving

The next step of the processing actually takes place as the data is being transmitted to the channel computers. Once the games have been selected for each channel in the system, each channel is processed in turn. For each channel, the games are broken into manageable packets for data transmission. These packets are then interleaved so that each game arrives at the adapter in the required download time (60 seconds, although the system also supports 30 seconds for larger games, if desired). If a download time of 30 seconds is used, the overall effect is as though that game was added to the channel two times, so that the overall per channel average download time will increase somewhat.

In addition, each packet that is processed has a data check pattern calculated for it, so the game adapter may validate the integrity of the data download. This process takes approximately 8 to 12 minutes for a load of 65 MB of data. The computation of the check patterns is done once at the server, rather than continuously at the channel computers, because the game data is static for any particular game load.

Note that the channel computers stop transmitting data during this download. Without doubling their memory capacity, there would be a synchronization problem between the incoming new and outgoing old data streams. *Thus the service is unavailable for this 8 to 12 minute time period.* Since loading is an infrequent operation, the reloads can be scheduled during time periods for which there are few, if any, users of the service.

The channel computers have memory capacity for just under 15 MB of data, which is transmitted to the game adapter in about 86 seconds at the standard T1 data transmission rate. If too much data is downloaded to any particular channel computer, it will not transmit, since some games would be incomplete. This condition can be detected through the use of the server's user interface by displaying the Display game server channel load information screen, described in *Section 6, Game Server User Interface*.

Service Code Switching

The General Instrument Sega Channel implementation supports the Play-Per-Day operation of rental games. In order to support this function, the game server (which originates some of the in-band data to the game adapter) must switch the service codes for rental games on a daily basis. Normally, each game has a single service code associated with it; a rental game has four service codes. In the uplink originated system, the service code for a rental game rotates through these four service codes each day at 12:00 AM Mountain time. In a local origination system, the service code rotates through the four service codes each day at 12:00 AM, according to the local server's clock. The addressable controller must also be set to the same time for the correct Play-Per-Day operation. This allows for the smooth control of authorization and de-authorization of rental games in the system.

Section 5

Features of the SCC-1

The Sega Channel Computers accept processed game data from the Sega Game Server. They receive their portion of the games from the SGS-1 via an Ethernet link. Each channel computer contains a game data interface card (GDIC) which, in cooperation with the channel computer software, performs the following tasks:

- Data formatting
- Adding of tag and control information
- Game data encryption

The output of the GDIC is an unframed T1 data stream running at 1.536 Mbits/sec. In an uplink configuration, the GDIC interfaces to the data multiplexer through an RS-530 interface. In a local origination system, the GDIC interfaces directly to an SST-1.

Section 6

SGS-1 User Interface

The operation of the game server is totally automated. However, to simplify the configuration and to allow for status checking, a user interface is provided. The user interface is a text-based interface available when working with the system console and during dial-in operation.

The user interface provides the following options:

- Configuring of encryption keys
- Configuring of channel computers
- Setting of system time
- Manual copying of the CD to the hard disk
- Manual reloading of the channel computers
- Displaying channel loads
- Displaying channel computer status
- Exiting from the user interface

Access to the game server is controlled via a user name and password. Once successfully logged in, the Main Menu appears. The configuration of the game server is not normally changed. However, several options can be accessed from the Main Menu to make configuration changes easier.

```
          ---------- SEGA Game Server ----------

Main Menu

  (1) Change configuration parameters
  (2) Change transmission data
  (3) Display operating status

  (4) Quit screens

Enter selection?
```

Logging in to the System

To log into the user interface, follow the steps detailed below.

1 At the `username:` prompt, type **server**.

2 At the `password:` prompt, enter the password. The Main Menu will appear.

Changing System Configuration

Three options are available to allow configuration of the server. They include:

- Changing encryption keys
- Changing the channel computers used in the system
- Changing the system time

Encryption Keys

The server comes pre-configured with a list of 128 encryption keys that are used by the ACC-2000 and ACC-4000. The server supports the viewing and/or modification of each of the 128 game data encryption keys. Please note that changes made to the encryption key list do not take effect until the next channel computer reload (scheduled or forced).

Warning

The encryption keys are sensitive General Instrument proprietary information, and should be treated as such.

To view or change the encryption key values, follow the steps detailed below.

1 From the Main Menu, select option 1, Change configuration parameters. The Change configuration parameters menu will display:

```
          ---------- SEGA Game Server ----------

Change configuration parameters

  (1) Change encryption keys
  (2) Change channel computer configuration
  (3) Change system time

  (4) Return to main menu

Enter selection?
```

2 From this menu, select option 1, Change encryption keys. The Change encryption keys menu will display:

```
---------- SEGA Game Server ----------

Change encryption keys

  (1) Display key value
  (2) Change key value

  (3) Return to previous menu

Enter selection?
```

3 To view the game data encryption key values, select option 1, Display key value. You will be prompted to enter the key number, as displayed below:

```
---------- SEGA Game Server ----------

Change encryption keys

  (1) Display key value
  (2) Change key value

  (3) Return to previous menu

Enter selection? 1

 Enter key number (decimal, 0..127)? 1
 Key value is $EB 7B 37 57 89

... press <Enter> to continue ...
```

Enter the encryption key number then press ENTER. The system will respond with the key value for the specified key number, as displayed above. Press ENTER to return to the Enter selection prompt.

4 To change the key value, select option 2, Change key value. The following screen will display:

```
          ---------- SEGA Game Server ----------

Change encryption keys

  (1) Display key value
  (2) Change key value

  (3) Return to previous menu

Enter selection? 2

Encryption key changes do not take effect until the next
reload (scheduled or forced).

 Enter key number (decimal, 0..127)?
```

5 Enter the key number, then press ENTER. The following prompt will appear:

```
Enter key bytes, separated by spaces (hex, MSB..LSB)?
```

6 Enter the key bytes, then press ENTER, for example, **a1 b2 c3 d4 e5**. Please remember encryption key changes do not take effect until the next reload (scheduled or forced). Press ENTER again to return to the Enter selection prompt.

7 To return to the Change configuration parameters screen, select option 3, Return to previous menu.

8 To return to the Main Menu, select option 4, Return to main menu.

Channel Computers

The server communicates to no more than eight channel computers over a standard 10 Base-T Ethernet local area network. The Ethernet hardware addresses are set up using the Change channel computer configuration screen. In addition, the encryption status of each channel is set on this screen. This status includes whether or not the channel is encrypted, and which key value is being used to encrypt the channel.

Warning

The encryption keys are sensitive General Instrument proprietary information, and should be treated as such.

Warning

The Ethernet hardware address should only be changed if a channel computer needs to be swapped out.

Note that any change to information on this screen forces a channel computer reload upon returning to the previous menu, since the data is encrypted in real-time by the channel computers, and the destination Ethernet addresses are specified here.

A high-level data encryption is always carried out over the satellite link. Encryption configuration, as entered here, deals only with the lower level game data encryption that is generated by the channel computers, which is eventually decrypted by the game adapter.

Even though the server can handle up to eight channel computers, the satellite multiplexer and the modulator currently support only six T1 data channels.

Viewing Current Channel Computer Configuration

To view the channel computer configuration, follow the steps detailed below.

1 From the Main Menu, select option 1, Change configuration parameters. The Change configuration parameters menu will display.

2 From this menu, select option 2, Change channel computer configuration. The Change channel computer configuration menu will display:

```
          ---------- SEGA Game Server ----------

Change channel computer configuration

  (1) Display channel computer list
  (2) Change single channel computer configuration

  (3) Return to previous menu

Enter selection?
```

3 To display the channel computer configuration information, select option 1, Display channel computer list. The Display channel computer list screen will display:

```
          ---------- SEGA Game Server ----------

Display channel computer list

Channel  Status          Ethernet Address    Encryption Key   State

   0      active         00:40:53:00:15:56          1         encrypted
   1      active         00:40:53:00:20:6E          1         encrypted
   2      active         00:40:53:00:20:90          1         encrypted
   3      active         00:40:53:00:20:65          1         encrypted
   4      active         00:40:53:00:21:25          1         encrypted
   5     inactive        00:40:53:00:20:99          1         encrypted
   6     inactive        00:00:00:00:00:00          0           clear
   7     inactive        00:00:00:00:00:00          0           clear


... press <Enter> to continue ...
```

This screen displays each channel along with its activation status, Ethernet address, encryption key value, and whether or not the channel is encrypted.

4 Press ENTER to return to the Change channel computer configuration menu.

Changing Current Channel Computer Configuration

The game server comes pre-configured with the addresses and status information for any given system. To change the channel computer configuration, follow the steps detailed below.

1 To change any of the values displayed on the Display channel computer list screen, from the Change channel computer configuration screen, select option 2, Change single channel computer configuration. The following prompt displays:

```
Enter channel number (decimal, 0..7)?
```

2 Enter the channel number, then press ENTER. You will be prompted for the following information:

```
Enter 0 for inactive 1 for active? 1

Change ethernet address from 00:00:00:00:00:00 (y/n)? y

Enter ethernet address, separated by spaces (6 hex bytes)? 00 40 53 00
21 35

Enter encryption key number (decimal, 0..127)? 1

Enter 0 for clear, 1 for encrypted? 1
```

3 At each prompt, enter the appropriate response for your site, then press the ENTER key to display the next prompt. Sample data is displayed above. After providing all necessary information, press ENTER to return to the Enter selection prompt.

4 To return to the Change channel computer configuration menu, select option 3, Return to previous menu. The following message will display:

```
configuration has changed... please wait 8-12 minutes for reload...
```

5 Once the reload is complete, the following message will display:

```
... press <Enter> to continue ...
```

6 Press ENTER to return to the Change configuration parameters menu.

Setting System Time

On occasion, the system time on the Sega Game Server may need to be changed. An option exists that allows the user to make this change. Follow the steps detailed below to change the system time.

1 From the Change configuration parameters menu, select option 3, Change system time. The following prompt displays:

```
Current date/time is Thu Nov 02 09:17:01 1995

Enter new date/time (MM/DD/YY HH:MM)?
```

2 If the current date and time are incorrect, enter the correct date and time, then press ENTER.

3 At the `... press <Enter> to continue ...` prompt, press ENTER to return to the Change configuration parameters menu.

4 To return to the main menu, select option 4, Return to main menu.

To enable the change, the game server must be rebooted.

Changing Transmission Data

Copying CD to Hard Disk

An option exists on the Sega Channel's game server to allow the customer to process and test CDs without having to rely on the timed operation of a schedule file. However, the timed operation will still be working in the background, even if this copy option is used. Follow the steps detailed below to copy the information contained on the CD to the hard disk.

1 From the Main Menu, select option 2, Change transmission data. The Change transmission data menu will appear:

```
          ---------- SEGA Game Server ----------

Change transmission data

  (1) Copy CD to hard disk
  (2) Reload channel computers

  (3) Return to main menu

Enter selection?
```

2 From this menu, select option 1, Copy CD to hard disk. The following message will appear:

```
This process takes about 5 minutes, and completely replaces the current
games.

Are you sure (y/n)?
```

3 Enter **Y** or **N**, then press ENTER. If a response of Y is provided, the information contained on the CD will be copied to the hard disk.

Reloading Channel Computers

In the event of a power loss, the channel computers (which are RAM-based) will lose their game memory contents. This is not a practical concern, however, since uninterruptable power sources can be used. In order to allow the reloading of the current data which is already on the server's hard disk, an option exists to repeat the channel computer download sequence. On initial power up, the server automatically checks to see if any channel computer is in the virgin state (no game data). If so, the server automatically reloads all of the channel computers. Follow the steps detailed below to manually reload the current data.

1 From the Main Menu, select option 2, Change transmission data. The Change transmission data menu will appear.

2 From this menu, select option 2, Reload channel computers. The following message will appear:

```
This process takes between 8 and 12 minutes, and temporarily stops game
data transmission.

Are you sure (y/n)?
```

3 Enter **Y** or **N**, then press ENTER. If a response of Y is provided, the current data is reloaded.

Viewing Operating Status

Channel Loads

The channel load screens provide a post-processed view of the current game data load on the system. The screens indicate the following information:

- Games loaded on each channel
- Game identifier
- Current service code of each game
- Total channel load in bytes
- Cycle time of the channel (in seconds)

Note that rental mode (express) game service codes automatically change daily. To view the channel load screens, follow the steps detailed below.

1 From the Main Menu, select option 3, Display operating status. The Display operating status menu will appear:

```
          ---------- SEGA Game Server ----------

Display operating status

  (1) Display game server channel load information
  (2) Display channel computer status

  (3) Return to main menu

Enter selection?
```

2 From this menu, select option 1, Display game server channel load information. The Display game server channel load information screen for Channel 0 will appear:

```
---------- SEGA Game Server ----------

Display game server channel load information

Channel 0:
 Game filename          Game identifier         Service code
BEYONDOA.GI                   24                    481
DOUBLDRB.GI                   18                    481
VECTRMAN.GI                    1                    481
UNNECESS.GI                   52                    481
ARCUS.GI                      23                    481
PGATOUR2.GI                   55                    481
PITFIGHT.GI                    9                    481
PELE.GI                       21                    481
PAPRBOY2.GI                   30                    481
WACKYWLD.GI                   33                    481
GUID1095.GI                   50                    481
SCMENU.GI                      0                    480

12348840 bytes, 67.5 seconds

... press <Enter> to continue ...
```

3 To view the channel load information for Channel 1, press ENTER. The Display game server channel load information screen for Channel 1 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 1:
 Game filename          Game identifier          Service code
STRFGHT2.GI                    14                     481
EWJ2SPEC.GI                    40                     481
TAZ2FIN.GI                     15                     481
ASTERIX.GI                     51                     481
MIG29.GI                       26                     481
EXOSQUAD.GI                    46                     483
STRIDER.GI                     35                     481
BATMAN2.GI                      3                     481
ZOMBIES.GI                     17                     481
GREENDOG.GI                     5                     481
WCSOCCR1.GI                    22                     481
SCMENU.GI                       0                     480

12394956 bytes, 67.7 seconds

... press <Enter> to continue ...
```

4 To view the channel load information for Channel 2, press ENTER. The Display game server channel load information screen for Channel 2 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 2:
 Game filename          Game identifier          Service code
LETHLNF1.GI                    6                      481
GARFIELD.GI                   53                      481
PUNISHER.GI                   10                      481
SHINFORC.GI                   37                      481
INTENNIS.GI                   19                      481
SONIC2.GI                     13                      481
TINYSTAR.GI                   44                      481
RANGERX.GI                    54                      481
OOZE.GI                       48                      491
PHSTAR3.GI                    25                      481
FLICKY.GI                     32                      481
SCMENU.GI                      0                      480

12369336 bytes, 67.6 seconds

... press <Enter> to continue ...
```

5 To view the channel load information for Channel 3, press ENTER. The Display game server channel load information screen for Channel 3 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 3:
 Game filename          Game identifier          Service code
WRLDHERO.GI                  16                      481
LIGHTCRU.GI                  47                      487
ADBATMAN.GI                   2                      481
FLSHBACK.GI                  39                      481
MARKOMAG.GI                   7                      481
ROCKETKN.GI                  11                      481
STRTKDS9.GI                  49                      495
NORMYSBB.GI                   8                      481
KAWASAKI.GI                  27                      481
JEPSPORT.GI                  42                      481
STHBLADE.GI                  36                      481
SCMENU.GI                     0                      480

12487188 bytes, 68.2 seconds

... press <Enter> to continue ...
```

6 To view the channel load information for Channel 4, press ENTER. The Display game server channel load information screen for Channel 4 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 4:
 Game filename          Game identifier          Service code
MUTCHSP3.GI                   41                     481
RISTAR.GI                     38                     481
ECCO2.GI                      31                     481
URBANSTR.GI                   28                     481
THEMPARK.GI                   43                     481
GHOUL.GI                       4                     481
SHINOBI3.GI                   12                     481
HELP.GI                       45                     481
DROBOTNK.GI                   29                     481
SPACHAR2.GI                   34                     481
JBDBOXNG.GI                   20                     481
SCMENU.GI                      0                     480

12476940 bytes, 68.2 seconds

... press <Enter> to continue ...
```

7 To view the channel load information for Channel 5, press ENTER. The Display game server channel load information screen for Channel 5 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 5:
 Game filename          Game identifier          Service code

       0 bytes,  0.0 seconds

... press <Enter> to continue ...
```

8 To view the channel load information for Channel 6, press ENTER. The Display game server channel load information screen for Channel 6 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 6:
 Game filename          Game identifier          Service code

       0 bytes,  0.0 seconds

... press <Enter> to continue ...
```

9 To view the channel load information for Channel 7, press ENTER. The Display game server channel load information screen for Channel 7 will appear:

```
          ---------- SEGA Game Server ----------

Display game server channel load information

Channel 7:
 Game filename          Game identifier         Service code

       0 bytes,  0.0 seconds

... press <Enter> to continue ...
```

10 Press ENTER to return to the Display operating status menu.

Channel Computer Status

The channel computer status screen provides a real-time snapshot of the operating condition of each of the channel computers on the local area network. The information provided includes the following:

- Number of games and packets on each channel
- Last transmitted packet (to allow the user to determine if the channel computers are actually transmitting the data)
- Total number of game packets transmitted (since power up)
- Error status messages which can be used in the event of traceable failure (these messages are for use by General Instrument personnel only)

To view the channel computer status screens, follow the steps detailed below.

1 From the Main Menu, select option 3, Display operating status. The Display operating status menu will appear.

2 From this menu, select option 2, Display channel computer status. The Display channel computer status screen will appear:

```
          ---------- SEGA Game Server ----------

Display channel computer status

channel mode   number   total  current  reload   packets    errors:
number       of games packets packet  requests transmitted ck cmd string

  0   enabled   11     2410    2221      0       256108     0   0 v6----
  1   enabled   11     2419    2216      0       256112     0   0 v6----
  2   enabled   11     2414    2238      0       256134     0   0 v6----
  3   enabled   11     2437    2218      0       256137     0   0 v6----
  4   enabled   11     2435    2213      0       256133     0   0 v6----

... press <Enter> to continue ...
```

3 To return to the Display operating status menu, press ENTER.

4 To return to the Main Menu, select option 3, Return to main menu.

Exiting the User Interface

Since the server is a workstation-based environment, a user must log in to the server user interface. An option exists to allow the user to log out, thereby allowing relatively secure system operation. To log out of the user interface, from the Main Menu, select option 4, Quit screens.

Appendix A
Specifications

SGS-1 Specifications

CPU

The SGS-1 is a 486-based 66 MHz computer in a rack-mountable chassis. A rack-mountable VGA monitor and rack-mountable keyboard are also included.

The computer consists of an IDE hard disk controller, keyboard controller, 16 MB of DRAM with battery-backed real-time clock and CMOS RAM, and standard ISA expansion slots.

Ethernet Adapter

An 8-bit Ethernet interface adapter is used in one of the expansion slots. Its raw data rate is 10 Mbps (10Base-T).

Modem

A 9600 baud auto-answer modem is used in another of the expansion slots. It is used to provide a remote interface to the game server.

SCC-1 Specifications

Small Board Computer (SBC)

The SBC is a 486-based 50 MHz computer in the form factor of a 5 1/4 inch diskette drive.

The computer consists of an IDE hard disk controller, keyboard controller, ANSI X3.131 SCSI interface, dual-serial and parallel controller, 16 MB of DRAM with battery-backed real-time clock and CMOS RAM, and PC/104 stackable expansion bus.

Ethernet Adapter

The Ethernet adapter card plugs into the 486 SBC via the PC/104 expansion bus. Its raw data rate is 10 Mbit/second (10Base-T). It is used to interface the game server to the channel computer via a twisted wire pair.

Game Data Interface Card

The game data interface card will plug into the 486 SBC via the PC/104 expansion bus. It is used by the SBC to transmit the combined game and control data streams at a T1 rate, 1.536 Mbit/second.

Rack-Mount Chassis

The rack-mount chassis is 1 unit high and 19" wide. It must accommodate two SBCs, two Ethernet cards, two game data interface cards, and a power supply.

Power Supply Requirements

ac 90 to 260 Vac, 47 to 63 Hz

dc +5 volts ± 5% @ 6 amps

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