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Chapter 1

SDI Overview

The SSEC Desktop Ingestor (SDI) takes a simple approach to satellite data ingesting. A fast PC plus a modified third party interface card receives clock and data from a bit sync. For high data rate satellites, such as GVAR and POES, the entire serial data stream is ingested into memory, blocked into 1 Mbyte files, and written to disk. These files are called Stretched Data Format (SDF) files. An independent program analyzes the SDF files to build index files to the information in the SDFs. Data access is handled by an ADDE server running on the ingest processor without interfering with the ingest process. For low data rate satellites, such as METEOSAT PDUS, image files are built directly as the data is received. The image files contain the raw satellite transmission aligned on byte boundaries with sync removed.

The advantages to these approaches are:

- No frame synchronizer or SAS (Satellite Acquisition System) is required. The frame synchronization is done in software.
- For the high data rate approach, SDF files usually use less disk space than area files; therefore, more data can be stored on-line.
- The SDI runs without operator intervention, i.e., it is a black box. After attaching the clock and data cables to the card and booting up the PC, data ingestion begins.
- The same hardware works for multiple satellite families; i.e., the same hardware that handles GVAR handles POES, Meteosat, etc. Only the software running in the black box varies.

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SDI Data Processing Overview

Few meteorological satellites broadcast data directly to the user. Because of the satellite's complexity, the raw sensor data is usually downlinked to a ground station, which preprocesses and formats it into blocks. The data blocks are uplinked to a geostationary satellite (may be the originating satellite), which broadcasts the data to users.

Most meteorological satellites simultaneously scan a portion (sector) or all of the earth with several sensors having different spectral characteristics. Only the data from sensors having the same spectral characteristics can be used to generate a specific image. For example, a GVAR satellite's imager, provides data for generating several IR images and one visible image during a scan of a sector. To generate a visible image, only the visible spectrum data is used; to generate an IR image, only the data from a specific IR sensor is used.

The satellite sends all data to the ground station in near real time. For most satellite types, the ground station delays data only long enough to form complete blocks. When a block is formed, it is queued for retransmission. Therefore, serial data, as received from a meteorological satellite, consists of interleaved sensor data blocks, as well as nondisplayable data such as documentation and calibration blocks. To generate an image, the data from a specific sensor or group of sensors must be sorted out of the incoming data stream and presented to a display device.

SDI's approach to the sorting process when handling high data rates is to store all received data in fixed length files (SDF files) in the order it is received. Then, create a data location file for each possible image that points to the data blocks in the SDFs that are required to build the image. If a specific image is requested, the entries in its location file are used by transfer software to locate the beginning and length of each data block in the image. The transfer software simply reads the blocks in the sequential order listed in the data location files. In this way, SDF data is never actually sorted or moved; it is only inventoried and read. This approach is used by the SDI for the higher data rate satellites because there is not enough time between incoming data transfers to decommutate the data into areas.

SDI's approach to the sorting process when handling low data rates is to initially store all received data in a buffer. Then, locate the beginning of a data block and read its data type from the block's header information. Finally, the data block is transferred to the appropriate image file. A separate image file is

created for each data sensor type received.

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SDI File Descriptions

The types of SDI files common to all high data rate satellite types (GVAR and POES) are:

- SDF Files (Stretched Data Format)
- Index Files
- Descriptor Files
- Image Files

Image files are also generated for lower data rate satellite types (MTSAT and Meteosat).

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SDF Files

The SDI hardware converts the serial data and clock to 32-bit parallel words and stores them in an 8K by 32-bit FIFO. When 4,096 words have been collected, the ingestor software transfers 4,096 words to an SDF file in the ingestor's hard drive. Sixty-four transfers are required to build a 1,048,576 byte (1 Mbyte) SDF file. Thus, each SDF contains 8,388,608 satellite data bits.

Data Storage Requirements

To determine the number of seconds per SDF, divide 8,388,608 by the satellite's bit rate. For example, GVAR's data rate is 2,111,360 bits per second. Therefore, each SDF provides 3.973 seconds of data storage (8,388,608/2,111,360=3.973). At this rate, 906 SDFs are generated per hour.

The data in each SDF file includes all data types sent. Nothing is stripped out and there are no byte aligned boundaries. Thus, new data blocks can start anywhere in any SDF word.

SDF File Naming Convention

SDF files are named using the following convention.

signal_type.ccyy.ddd.hhmmss

Where:

signal_type is the satellite signal type, e.g., gvar, poes, etc.

cc is the century when the file was written to disk

yy is the year when the file was written to disk

ddd	is the julian day the file was written to disk
hh	is the UTC hour the file was written to disk
mm	is the minute the file was written to disk
ss	is the second the file was written to disk

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Index Files

The data location files are called index files, and one is created for each image type detected in the SDFs. An index file consists of a series of text lines, one for each data block or frame in the image. If the image consists of 1800 blocks, its index file contains 1800 text lines. Each text line describes the location of a data block in an SDF that is required to create the complete image. For example, if a certain image consists of 1,000 blocks distributed in 400 SDFs, its index file has 1,000 ASCII text lines. Since the index files are in ASCII format, they can be viewed using most Unix file viewing commands.

Index file text entries are generated by an SDF scanning process that looks for the beginnings of blocks. When a block's beginning is located, its length, type and location information, including the SDF file name, are formed into a text line and stored in the appropriate index file.

For some satellites, multiple index files are created simultaneously. For example, GVAR imager data block descriptions are stored in one index file (Blocks 0 through 10), while all Block 11 descriptions are stored in another index file.

Index File Format

The index file format is different for different satellites types. Refer to the index file Format description in the satellite-specific chapter for a complete description of the index file format for your ingestor.

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Descriptor Files

A descriptor file contains a list of currently available index files (images) for a specific data type and area of coverage. The file name indicates the area of coverage or type of data. Each satellite type has a unique set of descriptor file names, which are described in its ingestor procedures chapter. However, all satellite types have a descriptor file name called ALL. This descriptor file contains a list of all available images for this satellite type, regardless of the area of coverage.

Note!
The descriptor names are designed to be used as a search tool
for images and their times over your areas of interest only.
No sectorizing is done by the SDI system.

Descriptor File Naming Convention

The naming convention is: **`/data/`***descriptor*

Where: *descriptor* is the descriptor file name.

As an example, the file **`/data/HRPT`** contains a list of all the index files for POES HRPT images on the SDI computer.

Descriptor File Format

The descriptor file format is different for different satellite types. Refer to the Descriptor File Format description in the satellite-specific chapter for your ingestor for details.

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Image Files

Image files contain a very raw format of the satellite signal. The ingestor removes only the sync blocks and aligns the data on byte boundaries if it is 8-bit data.

Image file formats depend on the transmission format of the satellite. Therefore, refer to the Image File Format description in the satellite-specific chapter of your ingestor for details.

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SDI Software Structure

The SDI software consists of:

- Data Processing Software
- Configuration Files

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Data Processing Software

The data processing software is made up of two components, the ingest and decode component, and the server component.

The ingest and decode component receives the incoming raw satellite data from the SDI card and stores and decodes the data into files. The ingest and decode components are located in subdirectories of **`/opt`**.

The server component fulfills client requests by extracting the requested data and sending it to the client. The server components are located in **`~mcadde/mcidas/bin`** (versions 1999nov29 onward) or **`~mcidas/bin`** (pre-1999nov29 versions).

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Configuration Files

All configuration files exist (depending on the ingestor type) in the following directories.

Directory	Description
/etc/init.d	ingestor control files, e.g., **ingcntl**
/data	ingestor configuration and descriptor files, e.g., **notify.list**, **names.gvar**
~mcadde	server configuration files, e.g., **.mcenv**
~mcadde/mcidas/data	server configuration files, e.g., **RESOLV.SRV**
/home/tip	decoder configuration files, e.g.,**.tiprc**, **noaa15_7_tip.cfg**
/sounder	decoder configuration files, e.g.,**.soundrc**

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SDI Clock Time

In general, the local SDI clock time only needs to be approximately correct (within a few minutes) since navigation and image start times use the image time transmitted in the signal. One exception to this is DMSP which uses the local clock on the SDI to help in the navigation of images.

SSEC installs **`xntp`** on SDI configurations that are local time sensitive (like DMSP). For all other configurations, it is the SDI user's responsibility to maintain the time.

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SDI Event Handling System

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Overview

The SDI ingestor implements an event handling system via the electronic mail medium. When the ingestor detects an event; e.g. a start of a new image, it sends a mail message to a list of users defined in an event notifier list file. The content of the mail message describes the event. Content differs depending on the source and type of the event. The following is an example of the content of an event mailed by the GVAR ingestor:

```
gvar.1997.202.205303.INDX 16537 21512 2973 5368
```

Please refer to the satellite specific chapter for a complete description of the event types and contents of event mail messages for your satellite.

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The Event Notifier List File

The event notifier list file, **`notify.list`**, is in the same directory that the ingestor is started from. It is usually in **`/data`**, but may be in another directory due to site-specific changes. To find the correct directory, look for the line in the file **`/etc/init.d/ingcntl`** that begins with the **`cd`** command. For example, to receive the ingestor events from an ingestor whose **`/etc/init.d/ingcntl`** includes the line **`cd /noaa`**, the **`notify.list`** file would need to be in **`/noaa`**.

The format of the **`notify.list`** file is one e-mail address per line. For example, to send events to users john@doe, mary@jane and tomato@soup.wisc.edu, the **`notify.list`** file would look like:

```
john@doe
mary@jane
tomato@soup.wisc.edu
```

There may be additional event notifier list files for satellite-specific processes, such as GVAR Sounder.

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Logging the SDI Console Messages

If the variable LOG is defined in the file **`/etc/init.d/ingcntl`**, all console messages are appended to the file whose name is set in the LOG variable. As delivered, the system does not log console messages.

CAUTION!
If logging is enabled, you must truncate or rotate the log file or it will grow indefinitely. If logging is added, you must reboot in order for it to take effect. The file could become very large if things are not working well.

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Chapter 2

SDI Installation

This chapter consists of the SDI setup and installation instructions. Go to the corresponding section below to complete the necessary tasks.

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Initial Checkout and Setup

The SDI was initially built on an IBM® PC Server 310 computer; most later versions are built on IBM Netfinity server. Both computers run a Solaris operating system. SSEC's application software and custom hardware have been installed, and the complete SDI is tested prior to shipment. This reduces the initial checkout and setup to the following:

- Initial Inspection
- Location
- Power Requirements
- Component Interconnections
- Bit Sync Requirements
- Connecting External Inputs and Outputs

Perform the steps below to checkout and setup your new SDI system.

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Initial Inspection

1. Remove the components from their shipping containers and inspect them for signs of shipping damage. Contact SSEC for further instructions if damage is discovered.

Occasionally, SSEC's proprietary PCI interface card (shown in the picture below) becomes partially unseated during shipment. If this happens, you will get the following error message on your console when you power up the SDI.

```
Open error on /dev/jmb no such device or address
```

Therefore, as a precautionary measure, SSEC recommends that you remove the computer's outer case, reseat the interface card, and reinstall the outer case.

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Location

2. The SDI requires a standard PC environment that has access to the data and clock outputs from your satellite antenna chain. Since the SDI functions as an ADDE server, your location must also have a TCP/IP connection so that it can be accessed by ADDE clients.

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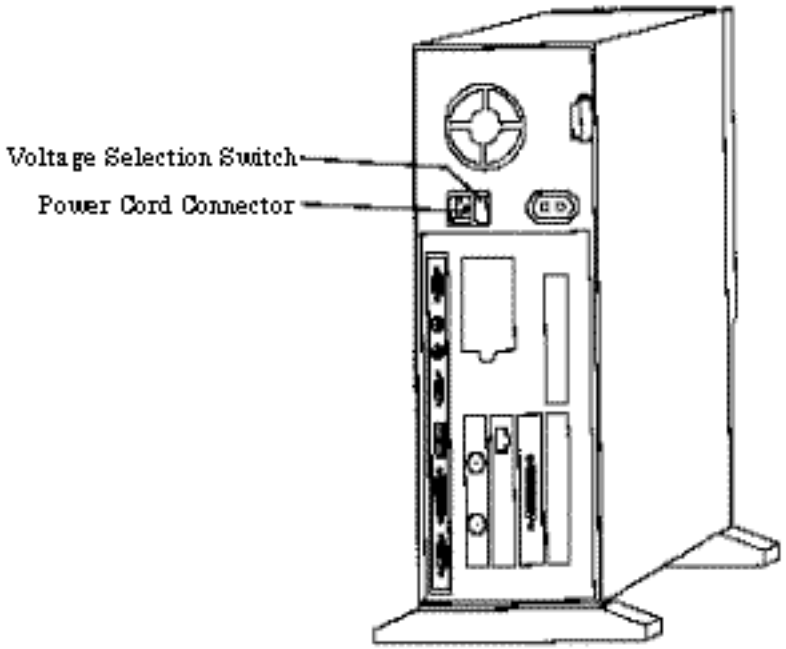
Power Requirements

3. Check that the voltage-selection switch is set to the correct position.

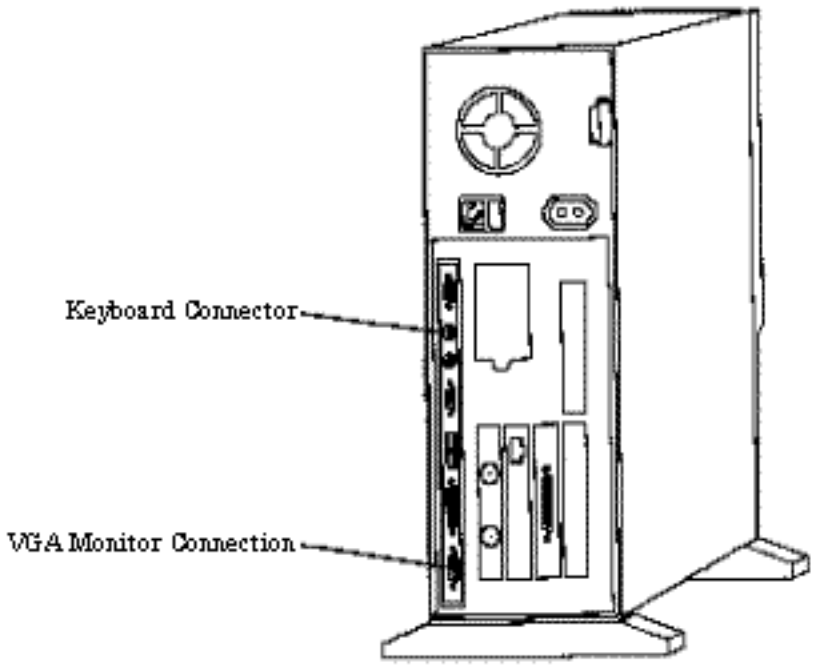


The PC Server 310 runs on one of two switch selectable AC voltage ranges, 90-137 VAC or 180-265 VAC. The voltage-selection switch is located immediately to the right of the AC power cord connector, as shown in the drawing above. If your voltage is between 90 VAC and 137 VAC check to see that 115 is visible on the switch; if your voltage is between 180 VAC and 265 VAC, check to see that 230 is visible on the switch.

CAUTION! If you set the voltage switch to the wrong position, you might permanently damage your SDI when you turn it on.

Component Interconnections

4. (Optional) Connect a monitor to the SDI.



The SDI does not include or require a monitor or mouse. However, you may want to use a monitor to initially verify normal operation. You can use any monitor by connecting its data cable connector to the 15-pin D-connector located at the bottom-left corner of the computer, as shown in the drawing at the left.

The SDI is normally operated from a remote location by ssh. Therefore, once normal operation is confirmed, there is no need for a monitor.

5. Connect the keyboard to the connector indicated in the drawing above.

The bit sync requirement is different for different satellite types. Refer to the Bit Sync Requirements description in the satellite-specific chapter for your ingestor for details.

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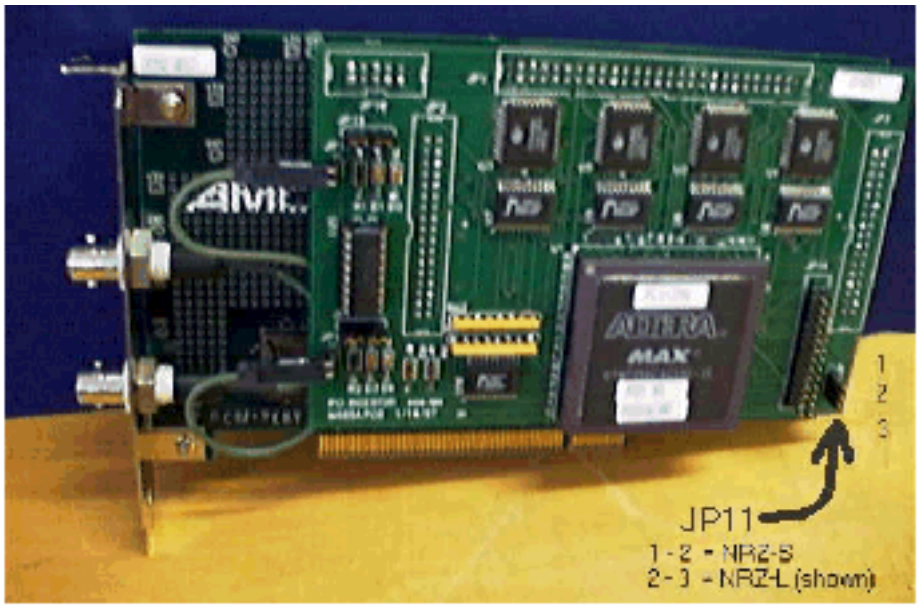
Bit Sync Requirements

Bit syncs provide clock and data outputs in either NRZ-L or NRZ-S format. The *PCI Ingestor* card in the SDI can decode either format via a selection jumper (JP11) on the PCI card. During initial installation, and/or after changing the bit sync, verify that the format selected on the PCI card matches the bit sync's output format. Refer to the picture below for the location of the jumper. With the *PCI Ingestor* board positioned as shown in the picture, pin 1 is "up".

The jumper configuration is defined as:

- 1 - 2 = NRZ-S
- 2 - 3 = NRZ-L

Remove the card from the PC before changing the jumper. If your SDI is an IBM Netfinity, first removing the bottom of the computer simplifies removal of the *PCI Ingestor* card.



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Connecting External Inputs and Outputs

6. Connect the Data and Clock inputs and the Ethernet cable according to the drawing below.

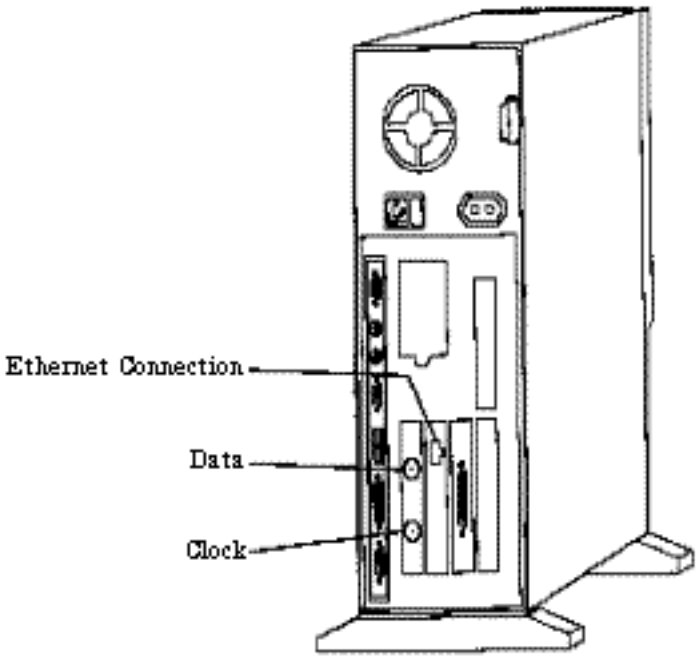
Your antenna chain provides two 75-ohm outputs from its bit synchronizer. They should be labeled data and clock. If the cables are not labeled, you will identify and mark them during the completion of this step.

Use an oscilloscope to verify that the output from each cable is between 2.0 and 2.75 volts peak-to-peak when terminated in a 75-ohm impedance. The line having a 50 percent duty cycle signal is the clock line. If it is not labeled, label it Clock and label the other line Data.

Connect the Data and Clock inputs shown in the drawing below.

Connect the Ethernet cable to the connector indicated in the drawing below. This completes the initial checkout and setup process.

Continue with the chapter that contains the operating instructions for your data type.



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Installing an SDI Software Update

You can obtain and install SDI software updates if you purchased McIDAS Users' Group (MUG) support for your SDI system or have been contacted and been given approval by SSEC. If you have a problem obtaining or installing the update, ask your site coordinator to contact the McIDAS Help Desk by email or by phone at (608) 262-2455.

The SDI software update installation consists of two tasks:

- Obtaining the SDI Software Update Files
- Installing the SDI Software Update

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Obtaining the SDI Software Update Files

The SDI software update contains the files below.

File Name	Description
sdi*version#***.sh**	shell script that does the build/install
sdi*version#***.tar.Z**	compressed tar file containing the server binaries, ingestor binaries, and data files

The *version#* above and hereafter refers to the name of the SDI software version (e.g., 2000jun06 or 2000jan12).

The software updates are distributed via download from the MUG Web Site or via CD (for an extra charge).

Obtaining the Update Files From the MUG Web Site

1. Use your Web browser to download the files listed above. Access the MUG Web Site at , and follow the SSEC Desktop Ingestor (SDI) link in the Software section. Each site has its own login and password for downloading files.

2. Log on to the SDI workstation as user **root** and move the downloaded files to the **~mcadde** directory. If you ftp the files from another workstation, be sure to use binary file transfers.

Obtaining the Update Files From a CD

1. Insert the CD into the drive and extract or copy the files listed above.

2. Log on to the SDI workstation as user **root** and move the downloaded files to the **~mcadde** directory. If you ftp the files from another workstation, be sure to use binary file transfers.

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Installing the SDI Software Update

Next, complete the steps below to install the SDI software update.

1. Log on to the SDI workstation as user **`root`**. Run all commands below from the **`~mcadde`** directory.

2. Install the SDI software update using the appropriate command below.

   To install the ingestor and server software,

   Type: **`sh ./sdi`***version#*`.sh install`

   To install the ingestor software only,

   Type: **`sh ./sdi`***version#*`.sh install ingestors`

   To install the server software only,

   Type: **`sh ./sdi`***version#*`.sh install servers`

3. From the console, issue a stop command to stop the ingestor.

   Type:**`/etc/init.d/ingcntl stop`**

4. From the console, issue a start command to restart the ingestor.

   Type: **`/etc/init.d/ingcntl start`**

See the ingestor specific chapter in this manual for your ingestor's operating and ADDE server procedures.

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Chapter 3

GVAR Ingestor

This chapter applies to the GVAR signal only.

Topics discussed in this chapter are:

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Interpreting Bold and Italicized Terms

Throughout this chapter, actual keyboard entries appear in **BOLD** type. You will type these entries exactly as they appear. For example:

Type: **export DISPLAY=**

Variable entries appear in italics. For example:

Type: **export DISPLAY=***workstation***:0**

In this example, replace *workstation* with the workstation's name. For example, if you want to export the display to a workstation named zebra:

Type: **export DISPLAY=zebra:0**

File names and paths appear in **`courier bold`**. For example: **`/home/mcadde/mcidas/data`**

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Overview

The GVAR satellites contain two independent instruments, an imager and a sounder. Imager and sounder data are transmitted in formatted data blocks numbered 0-11. Imager data is transmitted via blocks 0-10; sounder data and 21 types of non-image data are transmitted via block 11. The GVAR Ingestor process writes all data to one megabyte files called Stretched Data Format (SDF) files. Between data writing cycles, the GVAR Ingestor process searches the SDF files for block starts. It stores the search results in one of two index file types, imager index files (.INDX file extension) or sounder index files (.B11 file extension). A new imager index file is created for each new image. A new block 11 index file is created every 10 minutes.

Since there are 22 types of block 11 data, a separate decoder called the GVAR Sounder Decoder is used to process sounder data from the 22 types of block 11 data.

The GVAR Sounder Decoder process reads the BK11 index files that were created by the GVAR ingestor. It decodes the block 11 sounder blocks into McIDAS AREA files, which are written to the **`/data`** directory.

Knowledge of the GVAR system and its data characteristics are not essential for routine operation of an SDI. However, if you experience difficulty, familiarity with these characteristics may help you diagnose operational problems. See *Appendix A, GVAR Signal Characteristics* at the back of this manual for an overview of the GVAR data format.

Knowledge of the SDI files, their structures, or their naming conventions are not considered essential for normal operation of the SDI. However, if you request technical assistance from SSEC, you may be asked to examine these files to assist SSEC in diagnosing your SDI operational problems. Therefore, an overview of these files is provided at the end of this chapter.

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Bit Sync Requirements

As shipped, the *PCI Ingestor* card in the SDI is configured to decode NRZ-L coded data from the bit sync. Currently, most if not all bit syncs used with GVAR produce an NRZ-L formatted clock and data, with the data changing on the rising edge of the clock. However, if your bit sync produces an NRZ-S encoded output, or you replace your bit sync in the future with a model that produces an NRZ-S output, you will need to reconfigure your *PCI Ingestor* card as described in *Chapter 2 - SDI Installation*.

The output should be TTL level output and terminated at 75 ohms. However, if you use a bit sync with a balanced (double-ended) output, the ingestor card can be reconfigured to receive it. Contact SSEC for reconfiguration instructions.

The GVAR bit rate is 2.111360 megabits per second.

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Ingestor and Sounder Decoder Operating Procedures

GVAR ingestor and Sounder Decoder operating procedures consist of the following:

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Using the Ingestor Console

The Ingestor Console, referred to hereafter as console, displays the ingestor's status. This procedure describes two console choices, a local monitor and a remote monitor.

The console is either a monitor that is physically connected to your SDI computer or an ssh session into the SDI computer from a remote workstation.

If you prefer to use a monitor, refer to Chapter 2 - *SDI Installation* for installation instructions. You will need to acquire a monitor locally since the SDI is not shipped with a monitor.

To use an ssh session, perform the following steps.

1. Log into the SDI as **`root`**.

2. Export the display to your workstation.

   Type: **export DISPLAY=***workstation***:0**

   where: *workstation* is the name of your workstation

3. Type: **(xterm -C&)**

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Starting the Ingestor and GVAR Sounder Decoder

When the computer is powered up, the ingestor and decoder start automatically. If you are unsure about the state of the ingestor, shutting down and restarting is the recommended procedure.

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Interpreting Console Messages

If you have a console, these are messages you may see:

There may also be messages from the system that are unrelated to the satellite ingest process, for example disk error or full disk.

New Image

At the beginning of each new image, a line similar to the following appears on the console.

```
New image   gvar.1997.113.205414.INDX Names:ALL CONUS
```

The **gvar.1997.113.205414.INDX** portion of this message is an index file name. Refer to the GVAR Index File Naming Convention for the complete description. Thus, **gvar.1997.113.205414** is interpreted as follows:

Field	*Definition*
gvar	is the satellite signal type (GVAR)
1997	is the year when the image started
113	is the day of the year the image started

20 is the UTC hour the image started

54 is the minute the image started

14 is the second the image started

INDX is the index file extension

The **Names:ALL CONUS** portion of the message above describes the ADDE dataset descriptors where the new index file is listed. In this example, **gvar.1997.113.205414.INDX** is listed in the descriptor files named ALL and CONUS.

Bit Slip

When the SDI software detects the start of a new GVAR data block, it reads the block length information from the block's header to compute the beginning of the next block. If the next block does not start at the predicted location, the current block contains more or less bits than its header indicated. A message appears on the console indicating the time and the words *bit slip*. You can expect to see some bit slips, and this may result in the loss of some data.

An increase in the number of bit slip errors may indicate a:

- deteriorating signal
- antenna positioning errors
- degradation of antenna chain electronics
- cable problem

Error

If the next block's synchronization code can't be located, the entire data block is lost and a message labeled as *error* appears on the console. This will result in the loss of data.

No Sync

The no sync message indicates that the ingestor is not seeing a sync pattern in the data stream. This is normal during housekeeping periods, but if it continues at other times, it could indicate any of the following:

- poor termination of the signal; if you have a "Y"d signal (e.g., you split the clock and data signal from the bit syncs many times over) it will affect the termination of the signal; SDI's have a 75

ohm terminator built-in, and if you Y off an additional set of clock and data signals from the bit sync's output, you'll only get 37.5 ohm termination, etc.

- the signal is NRZ-L format versus NRZ-S would prevent the SDI from recognizing the sync pattern; SDIs require NRZ-L format
- the clock and data cables are reversed, resulting in a no-sync error
- satellite problems (e.g., no data is being sent)
- antenna postioning errors, or any of the above listed problems for bit slips could also give the no-sync errors

CRC Error

A new image is started when the priority frame start time changes within a block 0 that has a valid CRC code. A new image will not start if the CRC code is invalid (because of noisy data, etc.), causing the new image's data to be pasted on the end of the previous image. If the CRCs continue to be invalid, a new image is started after five consecutive block 0s with a new priority frame start time are received, regardless of the CRC status. When an image is started while the CRC is bad, the console displays the message:

```
CRC not valid.
```

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Stopping and Restarting the Ingestor or GVAR Sounder Decoder

To stop the ingestor or GVAR Sounder Decoder, perform the following procedure as user **`root`**.

1. To stop the ingestor process, issue a stop command from the console.

   Type: **/etc/init.d/ingcntl stop**

2. To stop the GVAR Sounder Decoder process, issue a stop command from the console.

   Type: **/etc/init.d/sndcntl stop**

To restart the ingestor or GVAR Sounder Decoder process, either reboot (see *Shutting Down the Ingestor*) or perform these two steps:

1. To start the ingestor process, issue the start command from the console.

   Type: **/etc/init.d/ingcntl start**

2. To start the GVAR Sounder Decoder process, issue the start command from the console.

   Type: **/etc/init.d/sndcntl start**

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Shutting Down the Ingestor

Perform the following procedure to shut down the ingestor.

1. Issue the workstation shutdown command.

   Type: **init 0**

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Changing the Amount of Retained Data

SSEC sets a default of one hour for the amount of GVAR data to be retained (900 SDF files) prior to shipment. Perform the following procedure if you want to change the amount of data retained in your ingestor.

1. From the console, edit the file **`/etc/init.d/ingcntl`**

2. Change the value of the variable named SAVE_FILES= to the number of files to retain. For example, a GVAR SDF file represents 4 seconds of time. Therefore, 900 SDF files are generated during one hour of continuous transmission time, requiring about 1 gigabyte of data storage.

3. Stop and restart the ingestor process.

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Changing the Amount of Decoded Sounder Data

The GVAR Sounder Decoder images are written to a rotating spool of McIDAS area files. The amount of data retained is determined by the size of this spool, which may be adjusted to fit your needs by editing the beginning and ending range numbers in the file **`/sounder/.soundrc`**. Below is a sample of this file:

```
# This file defines the AREA loop for the sounder
# decoder.
################################################
area1=1001
area2=1336
```

Where:
area1 is the beginning number in the AREA spool
area2 is the ending number in the AREA spool

To adjust the amount of retained sounder areas, perform the following steps:

1. Modify the *area1* and *area2* variables in the **`/sounder/.soundrc`** sounder configuration file. The variable *area2* must always be greater than or equal to *area1*.

2. Update the R1 and R2 fields of the appropriate sounder datasets in the ADDE dataset resolution table. See *Changing Sounder Server Dataset Names*. The R1 and R2 fields should be set to those values defined for *area1* and *area2*, respectively.

Editing the names.gvar File

The **`names.gvar`** file is a configuration file that is used only with GVAR ingestors. It lists the GVAR descriptor file names and defines their sector boundaries (see the *GVAR Descriptor Files* description). Operators can edit this file to change descriptor boundaries if desired. Though most SDI GVAR ingestors have the same descriptors, each ingestor may define them differently via its **`names.gvar`** configuration file.

GVAR descriptors are used as search tools for locating GVAR images and their times for your geographical area of interest. For an image to be listed under a particular descriptor, it must include all of the sector area described by the descriptor's sector boundaries. This is a minimum requirement and some images may contain much more data than the descriptor indicates. For example, if you create a descriptor called WISC (Wisconsin) and set its sector boundaries just large enough to include all of the state of Wisconsin, WISC will contain any GVAR image that shows the entire state of Wisconsin. These images will include:

- all full disk images from GOES-East and GOES-West
- all northern hemisphere images from GOES-East and GOES-West
- all USA images from GOES-East and GOES-West
- any other images from GOES-East and GOES-West that includes all of Wisconsin

To change descriptor names or their boundaries, perform the following procedure.

1. From the console, login as **`root`** or ssh into the ingestor as **`root`**.

2. Edit the file **`/data/names.gvar`**.

   The first line in the file must always be

   ```
   ALL 0 0 0 0
   ```

   The last line in file must always be

OTHER 1 0 0 0

The format of the file is: *descriptor_name sline eline sele eele*

Where:

descriptor_name	descriptor name (e.g., NH for Northern Hemisphere)
sline	starting image line number
eline	ending image line number
sele	starting image element
eele	ending image element

The table below is a sample GVAR descriptor file

Table 3-1: Sample Descriptor File Format (fields are space delimited)

ALL	0	0	0	0
CONUS	3250	5300	16700	17400
NH	3250	7400	11000	20000
SH	10200	10300	11000	12000
FD	2800	10000	11000	20000
OTHER	1	0	0	0

Example:

Using the **`names.gvar`** file above, any image that completely covers the area from image lines 3250 to 5300, and image elements 16700 to 17400 is listed in the descriptor file named **`CONUS`**.

3. Save the file.

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GVAR File Descriptions

The following GVAR files are described:

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GVAR Image Index Files

GVAR Index File Naming Convention

The naming convention is: *signal_type.ccyy.ddd.hhmmss*`.INDX`

Where:

signal_type	is the satellite signal type, e.g., gvar
cc	is the century when the image started
yy	is the year when the image started
ddd	is the julian day the image started
hh	is the UTC hour the image started
mm	is the minute the image started
ss	is the second the image started

As an example, the index file name for a 2005 GVAR image, whose nominal image date and time are 228 and 12:20:00, respectively, has the name **`gvar.2005.228.122000.INDX`**. This date and time is the "priority frame start time" from the satellite.

GVAR Index File Format

Each GVAR index file text entry has the following six fields GVAR

Field Name	***Description***
SDF name	name of the Stretched Data Format file containing the block

Word Offset	a four-byte word offset into the SDF file that locates the word containing the starting bit of this block.
Bit Offset	a bit offset into the word pointed to by the Word Offset to locate the block's starting bit
Length	the length of the block in bits
Block Type	the data block type identified; values are 0 to 10 (see *Appendix A, GVAR Signal Characteristics*)
Image Line	the image line this block is associated with (GVAR block 0's only)

Sync errors and bit-slip errors are also logged in the GVAR Image index files.

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Block 11 Index Files

Unlike an image index file, which describes a complete image, a new Block 11 index file is created every 10 minutes. The time portion of the Block 11 index file's name is the time the index file was created. Unlike the image index files, the time in the Block 11 index name is a local workstation time. When a Block 11 is located in an SDF file, an entry is made in the current Block 11 index file. Block 11 index files are in ASCII format and therefore can be viewed using most unix file viewing commands.

The naming convention for the Block 11 index files is:

`gvar.`*ccyy.ddd.hhmm***`.B11`**

Where:

cc	is the century when the image started
yy	is the year when the image started
ddd	is the Julian day when the image started
hh	is the UTC hour when the image started
mm	is the minute when the image started

Every entry in the Block 11 index file identifies a data block in an SDF file and it's location within the SDF file. As in the imager index files, sync errors and slipped bits are also logged in the Block 11 index file entries.

The fields in the Block 11 index have the same meanings as the imager index.

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GVAR Descriptor Files

Descriptor File Naming Convention

The naming convention is: **`/data/`***descriptor*, where *descriptor* is the descriptor file name. The descriptor file names used for GVAR are

- ALL (list of all available GVAR images)
- CONUS (Continental US)
- NH (Northern Hemisphere)
- SH (Southern Hemisphere)
- FD-E (Full Disk - East)
- FD-W (Full Disk - West)
- USA
- OTHER (list of images that do not fall into any other category other than ALL)

Because of the variable scan characteristic of GVAR, a nearly infinite number of image sectors are possible, making rigidly defined descriptor file names impractical. Therefore, GVAR descriptor file names describe the minimum coverage an image must have to be listed in the respective file. Except for descriptor files ALL and OTHER, each GVAR descriptor file name listed above is defined locally in a configuration file by listing the line and element of its four corners. When a new GVAR image becomes available (new index file), its four corners are compared to those of each GVAR descriptor listed above. If the new image falls completely inside the descriptor's boundary, it is listed in that file. All images are listed in at least two files. Some images are listed in several files. For example, an FD-E image is listed in the FD-E, NH, SH, CONUS, USA and ALL files. No image is listed in the OTHER listing if it is listed in any file besides ALL.

As an example, the file **`/data/USA`** contains a list of all the GVAR index files on the SDI computer containing, as a minimum, an image of the USA.

Descriptor File Format

Each GVAR descriptor file text entry has the following six fields

Field Name	Description
INDX_name	name of the index file describing this image
sline	starting line number
eline	ending line number
sele	starting element number
eele	ending element number
pos	absolute position number in the dataset - used by the ADDE Server

GVAR descriptors are defined in your site's **`/data/names.gvar`** configuration file. They indicate the image's area of coverage (e.g., CONUS for the continental US, or NHE for the northern hemisphere) for a particular image. This file can be edited to help you find images for particular areas of interest using the *Editing the names.gvar File* procedure. However, remember that the images the SDI indicates for your specified area of interest contain entire images (at full resolution) for that time period. For example, if your area of interest is CONUS, NHE and FD (full disk) images also cover this area. However, much more data must be transferred for an FD image than for a CONUS image. Descriptor files are also used by the ADDE server.

The table below is an example of the GVAR ALL descriptor file.

```
gvar.2005.030.160143.INDX 2973 9249 6512 17752 2
gvar.2005.030.160923.INDX 10037 9049 12496 22900 3
gvar.2005.030.161514.INDX 2805 9049 10120 22900 4
gvar.2005.030.163143.INDX 2973 9249 6512 17752 5
gvar.2005.030.163923.INDX 10037 9049 12496 22900 6
gvar.2005.030.164514.INDX 2805 9049 10120 22900 7
```

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Names.gvar Configuration File

See the *Editing the names.gvar File* procedure for a description of the **`names.gvar`** configuration file.

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Navigation

GVAR navigation is filed in the McIDAS SYSNAV file format. The SDI Event System is configured to execute **`/usr/local/bin/sysnav.sh`** at the start of a new image. This program reads the navigation information from the current image and files navigation if any of the following conditions are true:

- this is the first image of a new day
- the navigation in the current image differs from the navigation of the most recently filed navigation

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Navigation File Naming Convention

The naming convention of the McIDAS SYSNAV files for GVAR is:

`/navigation/SYSNAV`*YYSS*

Where:

YY is the julian year of the navigation

SS is the McIDAS sensor source number of the satellite

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ADDE Server Procedures

The procedures discussed in this section are:

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Accessing the Data via ADDE

Once the SDI begins to ingest data and is connected to the network, the data can be accessed on McIDAS workstations via ADDE. The ADDE group name, by default, is GVAR.

Perform these steps to access the SDI's data.

1. From a McIDAS workstation:

   Type: **DATALOC ADD GVAR** *SDI IP address*

For example, if the SDI has an IP address of 144.92.108.32

   Type: **DATALOC ADD GVAR 144.92.108.32**

2. Use the ADDE command named DSINFO to determine the descriptor names:

   Type: **DSINFO I GVAR**

The output should look something like:

```
Dataset Names of Type: IMAGE in Group: GVAR

Name        NumPos      Content
--------    ----------  -----------
All         100         GOES-East all images
BLK11        11         GVAR sounder areas
CONUS        20         GOES-East continental U.S.
FD           20         GOES-East full disk
FD-E         20         GOES-East full disk
FD-W         20         GOES-West full disk
NH           20         GOES-East northern hemisphere
OTHER       100         GOES-East unknown
SH           20         GOES-East southern hemisphere
DSINFO -- done
```

At this point, the suite of ADDE commands can be used with the data.

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Changing Imager Server Dataset Names

Perform steps 1-3 in the following procedure to change or update imager server dataset names; perform steps 4-6 in the following procedure to change GVAR sounder dataset names.

1. From the console, login as mcadde or ssh into the ingestor as user mcadde.

2. To change ADDE names associated with particular datasets, edit the **~mcadde/mcidas/data/RESOLV.SRV** file. The following is a sample of this file. Notice that all fields are comma delimited.

```
N1=GVAR,N2=ALL,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East all images
N1=GVAR,N2=CONUS,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East continental U.S.
N1=GVAR,N2=NH,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East northern hemisphere
N1=GVAR,N2=SH,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East southern hemisphere
N1=GVAR,N2=FD,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East full disk
N1=GVAR,N2=FD-E,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East full disk
N1=GVAR,N2=FD-W,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-West full disk
N1=GVAR,N2=OTHER,TYPE=IMAGE,K=GVAR,R1=1,R2=2500,C=GOES-East unknown
```

Where:

N1	is the ADDE group name
N2	is the ADDE descriptor name
TYPE	is the data type
K	is the data format or kind
R1	is the beginning dataset position number (usually 1)
R2	is the ending dataset position number; this number should always be greater than the total number of images the ingestor has been configured to retain
C	is the comment field displayed with DSINFO

3. Save the file.

The IMGLIST command lists the images in a dataset. It always shows the image resolution as 1 (full resolution) and the image size as the complete image size. All sectorizing or image blowdowns are done via other ADDE commands such as IMGDISP, IMGCOPY, etc.

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Changing Sounder Server Dataset Names

1. From the console, login as mcadde or ssh into the ingestor as user mcadde.

2. To change ADDE names associated with particular datasets, edit the file **`~mcadde/mcidas/data/RESOLV.SRV`**. The following is an example of sounder datasets defined in this file. Notice that all fields are comma delimited. You can not place a comma in the comment field.

```
N1=EASTL,N2=BLK11,TYPE=IMAGE,RT=N,K=AREA,R1=2001,R2=2336,C=GOES-East SOUNDER AREAS,
N1=WESTS,N2=BLK11,TYPE=IMAGE,RT=N,K=AREA,R1=1001,R2=1336,C=GOES-West SOUNDER AREAS,
```

Where:

N1	is the ADDE group name
N2	is the ADDE descriptor name
TYPE	is the data type - IMAGE
K	is the data format or kind - area
R1	is the beginning AREA number in the range
R2	is the ending AREA number in the range, which should always be greater than or equal to R1
C	is the comment field displayed with DSINFO

3. Change the values of R1 and R2 in the **`/sounder/.soundrc`** file to match R1 and R2 in **`~mcadde/mcidas/data/RESOLV.SRV`**.

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Managing the Server's Routing Table

Users (clients) of the SDI ingestor's data must update their routing tables to link the SDI ingestor's group names to IP addresses. To do this, you must create or update a site routing table that contains the routing information for your site's clients.

The site's routing table can be created and updated in any McIDAS-X session by using the ADDE command named DATALOC to link group names to the IP addresses of remote servers. You will need to copy the table to a directory that is accessible to all clients. Clients must NFS mount the directory to access the file.

The default file name for all client routing tables is **`MCTABLE.TXT`**. To use a different name when creating or updating the site table, you must specify the file name in the **`MCTABLE_WRITE`** environment variable of the account running the McIDAS-X session. Write-protect the file so it can't be modified or deleted by your clients.

To make the table accessible to your McIDAS-X clients, each client's **`MCTABLE_READ`** environment variable must be modified to include this table.

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SDI GVAR Events

As described in the *SDI Event Handling System* section of Chapter 1, the SDI ingestor implements an electronic mail event system. The GVAR ingestor and sounder decoder generate three types of events:

- Index Created (imager start of image)
- Sounder SOI (Start Of Image)
- Sounder EOI (End Of Image)

These events are sent to the list in the **`/data/notify.bk11`** file.

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Index Created

The Index Created event is generated any time the GVAR ingestor sees a new image and creates an index file. The body of the e-mail for this event is in the following format:

index_file_name bele eele bline eline

Where:

index_file_name	is the name of the index file; see *GVAR Index File Format* for a complete description of the format of this file name
bele	is the beginning element of this image
eele	is the ending element of this image
bline	is the beginning line of this image
eline	is the ending line of this image

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Sounder SOI

The Sounder SOI event is generated any time the GVAR sounder decoder detects the start of a new sounder image and is creating a new McIDAS AREA file. The body of the e-mail for this event is in the following format:

SOI *bline nline bele nele jday time ss bscan escan area*

Where:

SOI	indicates this is a sounder start of image
bline	is the beginning detector scan line in sounder image (see Note below)
nline	is the number of detector scan lines in sounder image (see Note below)
bele	is the beginning element of sounder image
nele	is the number of elements in sounder image
jday	is the nominal julian day (yyddd) of sounder image
time	is the nominal time (hhmmss) of sounder image
ss	is the McIDAS sensor source number of satellite
bscan	is the beginning scan number of sounder image

escan is the ending scan number of sounder image

area is the McIDAS AREA number of decoded sounder image

Note: There are four detector scan lines in each GVAR sounder scan line.

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Sounder EOI

The Sounder EOI event is generated any time the GVAR sounder decoder finishes the decoding of a sounder image. The body of the e-mail for this event is in the following format:

EOI *area*

Where:

EOI indicates this is a sounder end of image

area is the McIDAS AREA number if decoded sounder image

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Chapter 4

POES Ingestor

This chapter applies to the POES signal only.

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Interpreting Bold and Italicized Terms

Throughout this chapter, actual keyboard entries appear in **BOLD** type. You will type these entries exactly as they appear. For example:

Type: **export DISPLAY=**

Variable entries appear in italics. For example:

Type: **export DISPLAY=***workstation***:0**

In this example, replace *workstation* with the workstation's name. For example, if you want to export the display to a workstation named zebra:

Type: **export DISPLAY=zebra:0**

File names and paths appear in **`courier bold`**. For example: **`/home/mcadde/mcidas/data`**

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Overview

Knowledge of the POES system and its data characteristics are not essential for routine operation of an SDI. However, if you experience difficulty, familiarity with these characteristics may help you diagnose operational problems.

Knowledge of the SDI files, their structures, or their naming conventions are not considered essential for normal operation of the SDI. However, if you request technical assistance from SSEC, you may be asked to examine these files to assist SSEC in diagnosing your SDI operational problems. Therefore, an overview of these files is provided in this chapter.

Throughout this chapter, you will see the related terms: Satellite Name, McIDAS Sensor Source (SS), and Spacecraft Address (or Sat-ID). The following table shows the current mappings between these terms.

Satellite Name	McIDAS Sensor Source (SS)	Spacecraft Address (Sat-ID)
NOAA-9	45	11
NOAA-10	60	15
NOAA-11	61	1
NOAA-12	62	9
NOAA-14	64	5
NOAA-15	65	7
NOAA-16	66	3
NOAA-17	67	11
NOAA-18	68	13
NOAA-N′	69	15

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Bit Sync Requirements

As shipped, the *PCI Ingestor* card in the SDI is configured to decode NRZ-L coded data. The bit sync that is normally used with POES outputs biphase formatted data. An SSEC designed and built converter called a *POES Sync Correlator* converts the biphase output from the bit sync to NRZ-L. However, if your bit sync produces NRZ-L or NRZ-S encoded outputs, do not use the *POES Sync Correlator*. Instead, connect the bit sync outputs directly to the SDI and configure the *PCI Ingestor* card as described in *Chapter 2 - SDI Installation*.

The clock and data outputs from the *POES Sync Correlator* should be TTL level outputs and terminated at 75 ohms. If you use a different bit sync that has NRZ-L or NRZ-S balanced or single-ended outputs, the SDI card can be reconfigured to receive it. Contact SSEC for reconfiguration instructions.

The POES bit rate is for 666 kilobits per second for HRPT and 1.33 megabits per second for GAC and LAC.

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POES Ingestor Operating Procedures

POES SDI operating procedures consist of the following:

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Using the Ingestor Console

The Ingestor Console, referred to hereafter as console, displays the ingestor's status. This procedure describes two console choices, and provides a list of console messages and their interpretations.

The console is either a monitor that is physically connected to your SDI computer or an ssh session into the SDI computer from a remote workstation.

If you prefer to use a monitor, refer to Chapter 2 - *SDI Installation* for installation instructions. You will need to acquire a monitor locally since the SDI is not shipped with a monitor.

To use an ssh session, perform the following steps.

1. Log into the SDI as **`root`**.

2. Export the display to your workstation.

   Type: **export DISPLAY=***workstation***:0**

   where: *workstation* is the name of your workstation

3. Type: **(xterm -C&)**

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Interpreting Console Messages

If you have a console, these are the normal message types you may see; they are discussed below:

- Deleted
- New Image (index filed)

There may also be messages from the system that are unrelated to the satellite ingest process, for example disk error or full disk.

When an image ingest begins, a line similar to the following appears on the console.

```
poes.2005.198.122552.LAC
```

This message is an index file name. It is made up of the satellite type (POES in this example), the year, julian day and time that the image began being ingested, and the type of data in the file (Local Area Coverage, or LAC in this example). For complete information on the file naming scheme, refer to the *Index File Naming Convention* section.

Deleted

If the image contains less than 200 lines after it is completely ingested, it is automatically deleted, and the word **deleted** is appended to the console message to indicate its deletion. If the image above is deleted, this message would appear.

```
poes.2005.198.122552.LAC deleted
```

New Image

If the image contains 200 or more lines after it is completely ingested, the image is kept, and additional information about the image is appended to the console message, as shown in the following example.

```
poes.2005.198.113827.LAC sat=13 day=198 time=115444 lines=3716 del=2 err=2
```

The **sat=13** portion of this message is the spacecraft address as it is defined in the data stream. This is not the McIDAS Sensor Source (SS) number (see the table at the beginning of this chapter).

The **day=198** portion is the nominal julian start day of the image.

The **time=115444** portion is the nominal start time (hhmmss) of the image.

The **lines=3716** portion is the total number of lines in this image.

The **del=2** portion indicates the number of lines deleted from this image. Sometimes there is a small amount of bad data or data from the previous image at the start of the data transmissions. The **del=** parameter indicates how many of these lines have been deleted from the image. The first 60 lines of HRPT files generated at SSEC are always deleted before checking for bad data and are not shown in the **del=** count.

The **err=2** portion indicates the number of bit slips or data errors detected in the image.

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Logging Console Messages

The console messages can also be routed to a file by setting the file name you want the messages written to in the environment variable **LOG**. SSEC's console messages are written to the file **`/var/log/inge`**.

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Stopping, Restarting or Shutting Down the Ingestor

Stopping the Ingestor

To stop the ingestor, issue a stop command from the console as user **`root`**.

Type: **/etc/init.d/ingcntl stop**

Restarting the Ingestor

To restart the ingestor process, either reboot by performing the *Shutting Down the Workstation* procedure below and then cycling the power to restart the ingestor, or issue the start command from the console. To issue the start command,

Type: **/etc/init.d/ingcntl start**

Shutting Down the Workstation

To shut down the entire workstation, including the ingestor, issue the workstation shutdown command from the console.

Type: **init 0**

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Changing the Amount of Retained Data

SSEC sets the default for the amount of POES data to be retained as a function of the size of the hard disk installed prior to shipment. About 900 SDF files can be stored per gigabyte of hard drive space. For example, if SSEC is currently shipping machines equipped with a nine-gigabyte hard drive, its default is set to retain 7,000 SDF files. Perform the following procedure if you want to change the amount of data retained in your ingestor.

1. From the console, edit the file **`/etc/init.d/ingcntl`**.

2. Change the value of the variable named SAVE_FILES= to the number of files to retain. One SDF file represents about six seconds of transmission time for GAC and LAC, or about 12 seconds of transmission time for HRPT. Therefore, 600 or 300 SDF files are generated per hour of GAC and LAC or HRPT data transmission time. This results in about 600 or 300 megabytes of data storage, respectively. The values realized operationally will vary because POES is not a continuous transmission. You will likely have to watch disk space utilization and adjust the SAVE_FILES= variable accordingly.

3. Stop and restart the ingestor process.

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POES File Descriptions

The following POES files are described:

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POES Index Files

One index file is generated for each image detected in the SDFs.

Index File Naming Convention

The naming convention is: *signal_type.ccyy.ddd.hhmmss.mode*

Where:

signal_type	is the satellite signal type, e.g., poes
cc	the century the image ingest started
yy	the year the image ingest started
ddd	the julian day the image ingest started
hh	the UTC hour the image ingest started
mm	is the minute the image ingest started
ss	is the second the image ingest started
mode	is the transmission mode of the satellite, e.g., LAC, GAC, HRPT

As an example, the index file name for a 2005 GAC image, whose start of ingestion date and time are 228 and 12:20:00, respectively, has the name **`poes.2005.228.122000.GAC`**.

Index File Format

Each index file text entry has the following eight fields. One entry exists in the index file for each data frame.

The screen display below is a portion of a POES index file for an HRPT image. Each line consists of eight fields, described below.

```
$ more poes.2005.012.180623.HRPT
poes.2005.012.180630 772767 6 5 1 12 180650 140  1
poes.2005.012.180630 776630 2 5 2 12 180650 306  2
poes.2005.012.180630 800492 6 5 3 12 180650 473  3
poes.2005.012.180630 814355 2 5 1 12 180650 640  4
poes.2005.012.180630 828217 6 5 2 12 180650 806  5
poes.2005.012.180630 842080 2 5 3 12 180650 973  6
poes.2005.012.180630 855942 6 5 1 12 180651 140  7
poes.2005.012.180630 969805 2 5 2 12 180651 306  8
```

```
  a    b   c     d      e   f  g h i    j     k  l
```

Field Key *Description*

a-d components that form the name of an SDF containing a portion of this image, where:

a is the signal type, e.g., POES
b is the year, e.g., 2005
c is the julian day that the image was received , e.g., day 012
d is the hour, minute and second the image was received, e.g., 18:06:30

e the byte address offset in the SDF that contains the start bit of the scan; for example, the first line in the screen display above begins somewhere in the 772,767th byte

f the location of this scan's starting bit in the byte pointed to by **e**

g the spacecraft address, not the McIDAS sensor source number, e.g., 5 (see the table at the beginning of this chapter)

h subblock; for GAC, this should always be zero; for HRPT and LAC this should be a repeating pattern, e.g., 1, 2, 3, 1, 2, 3,...

i nominal julian day of the image

j nominal hour, minute and second of the data, e.g., 18:06:50

k millisecond within the nominal second (e.g., 50) described in **j**

- **l** image frame line number

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POES Descriptor Files

POES descriptor files contain a list of currently available images for a specific data type. The data type is typically defined as the transfer mode. The file name indicates the transfer mode and each has a unique descriptor file name.

Descriptor File Naming Convention

The naming convention is: **`/data/descriptor`**, where *descriptor* is the descriptor file name as defined by the transfer mode of the satellite. The descriptors used for POES are:

- ALL (list of all available POES images)
- GAC (Global Area Coverage)
- HRPT (High Resolution Picture Transfer)
- LAC (Local Area Coverage)

The descriptor name is designed to be used as a search tool for images and their times. No sectorizing is done by the SDI system.

Descriptor File Format

The screen display below is an example of a POES GAC descriptor file. Each text entry consists of five fields, which are described below.

```
poes.2005.198.135033.GAC 5 198 104700 12779 141
poes.2005.198.143122.GAC 5 198 122800 12781 142
poes.2005.198.150627.GAC 9 198 132130 11100 143
poes.2005.198.151214.GAC 9 198 113230 13738 144
poes.2005.198.160938.GAC 5 198 141038 12525 145
poes.2005.198.164741.GAC 9 198 144851 12630 146
```

Field Name	*Description*
INDX_name	consists of **a-d**, as described in the *Index File Format* section, plus the signal type (e.g., GAC, LAC or HRPT)
Sat ID	the spacecraft address, not the McIDAS sensor source number (see the Spacecraft Address column in the table at the beginning of this chapter), e.g., 5
Day	nominal start julian day (ddd) of the image
Time	nominal start time (hhmmss) of the image
eline	ending line number of the image
position	unique number assigned to an image; if the same image is listed in more than one descriptor file (e.g., All and HRPT) it will have the same position number in each file

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Navigation

The SDI POES Ingestor does not perform any navigation processing. Navigation exists on the SDI ingestor system for the purpose of serving the image data. The server requires navigation because it must navigate the images in order to process requests and subsect the images.

The navigation file used by the ADDE image server is the McIDAS format SYSNAV1 file. This navigation file is updated with the latest POES navigation information from the TBUS messages transmitted on the Domestic Data Service conventional data circuit. The TBUS messages are decoded by the McIDAS-XCD conventional data ingestor/decoder, filed into the SYSNAV1 navigation file and predictions made. Twice daily, the SYSNAV1 file is copied from the -XCD decoder workstation to the SDI ingestor workstation and placed in the directory **`~mcadde/mcidas/data`**.

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ADDE Server Procedures

The procedures discussed in this section are:

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Accessing the Data via ADDE

Once the SDI begins to ingest data and is connected to the network, the data can be accessed on workstations running McIDAS via ADDE. The ADDE group name, by default, is POES. Perform the *Changing Server Dataset Names* procedure if you want to change it.

Perform these steps to access the SDI's data.

1. From a McIDAS workstation:

   Type: **DATALOC ADD POES** *SDI_IP_address*

For example, if the SDI has an IP address of 144.92.108.32

   Type: **DATALOC ADD POES 144.92.108.32**

2. Use the ADDE command named DSINFO to list the descriptor names.

   Type: **DSINFO I POES**

The output should look something like:

```
Dataset Names of Type: IMAGE in Group: POES

Name                NumPos       Content
--------------------------   --------------------------
ALL                 100          POES      All POES images
N15GAC              100          POES      NOAA-15 GAC images
N15HRPT             100          POES      NOAA-15 HRPT images
N15LAC              100          POES      NOAA-15 LAC images
N16GAC              100          POES      NOAA-16 GAC images
N16HRPT             100          POES      NOAA-16 HRPT images
N16LAC              100          POES      NOAA-16 LAC images
N17GAC              100          POES      NOAA-17 GAC images
N17HRPT             100          POES      NOAA-17 HRPT images
N17LAC              100          POES      NOAA-17 LAC images
N18GAC              100          POES      NOAA-18 GAC images
N18HRPT             100          POES      NOAA-18 HRPT images
N18LAC              100          POES      NOAA-18 LAC images

DSINFO -- done
```

At this point the suite of ADDE commands can be used with the data.

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Changing Server Dataset Names

Perform the following procedure to change or update server dataset names.

1. From the console, login as user **mcadde** or ssh into the ingestor as user **mcadde**.

2. To change ADDE names associated with particular datasets, edit the file **`~mcadde/mcidas/data/RESOLV.SRV`**. The following is an example listing of this file. Notice that all fields are comma delimited. You can not place a comma in the comment field.

```
N1=POES,N2=N15LAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-15 LAC images,
N1=POES,N2=N16LAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-16 LAC images,
N1=POES,N2=N17LAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-17 LAC images,
N1=POES,N2=N18LAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-18 LAC images,
N1=POES,N2=N15GAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-15 GAC images,
N1=POES,N2=N16GAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-16 GAC images,
N1=POES,N2=N17GAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-17 GAC images,
N1=POES,N2=N18GAC,TYPE=IMAGE,K=POES,R1=1,R2=100,Q=/data,C=POES NOAA-18 GAC images,
```

Where:

N1 is the ADDE group name (the default is POES; you can change N1 if desired)

N2 is the ADDE descriptor name (these names are fixed for POES and must not be changed)

TYPE is the data type - IMAGE

K is the data format or kind - POES

R1 is the beginning dataset position number (usually set to 1)

R2 is the ending dataset position number. This number should always be greater than the total number of images the ingestor has been configured to retain.

C is the comment field displayed with DSINFO

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SDI POES Events

As described in Chapter 1, the SDI ingestor implements an electronic mail event system. The POES ingestor generates only one event:

Index Created (new image)

The Index Created event is generated any time the POES ingestor sees a new image and creates an index file. The body of the e-mail for this event is in the following format:

index_file_name sat_id ddd hhmmss nlines

Where:

index_file_name	is the name of the index file; See *Index File Format* in this chapter for a complete description of the format of this file name.
sat_id	is the spacecraft address; this is the raw satellite ID number, not the McIDAS sensor source (SS) number. See the table at the beginning of this chapter
ddd	is the julian day in DDD of the start of this image
hhmmss	is the time in HHMMSS of the start of this image
nlines	is the total number of lines in this image

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POES ATOVS

The SDI is capable of decoding ATOVS (Advanced TIROS Operational Vertical Sounder) data from the NOAA-KLM series of satellites (NOAA-15, -16 and -17), as well as NOAA-N (NOAA-18). All ATOVS data are decoded into McIDAS area files, although users also have intermediate file formats available.

This section has information on the following:

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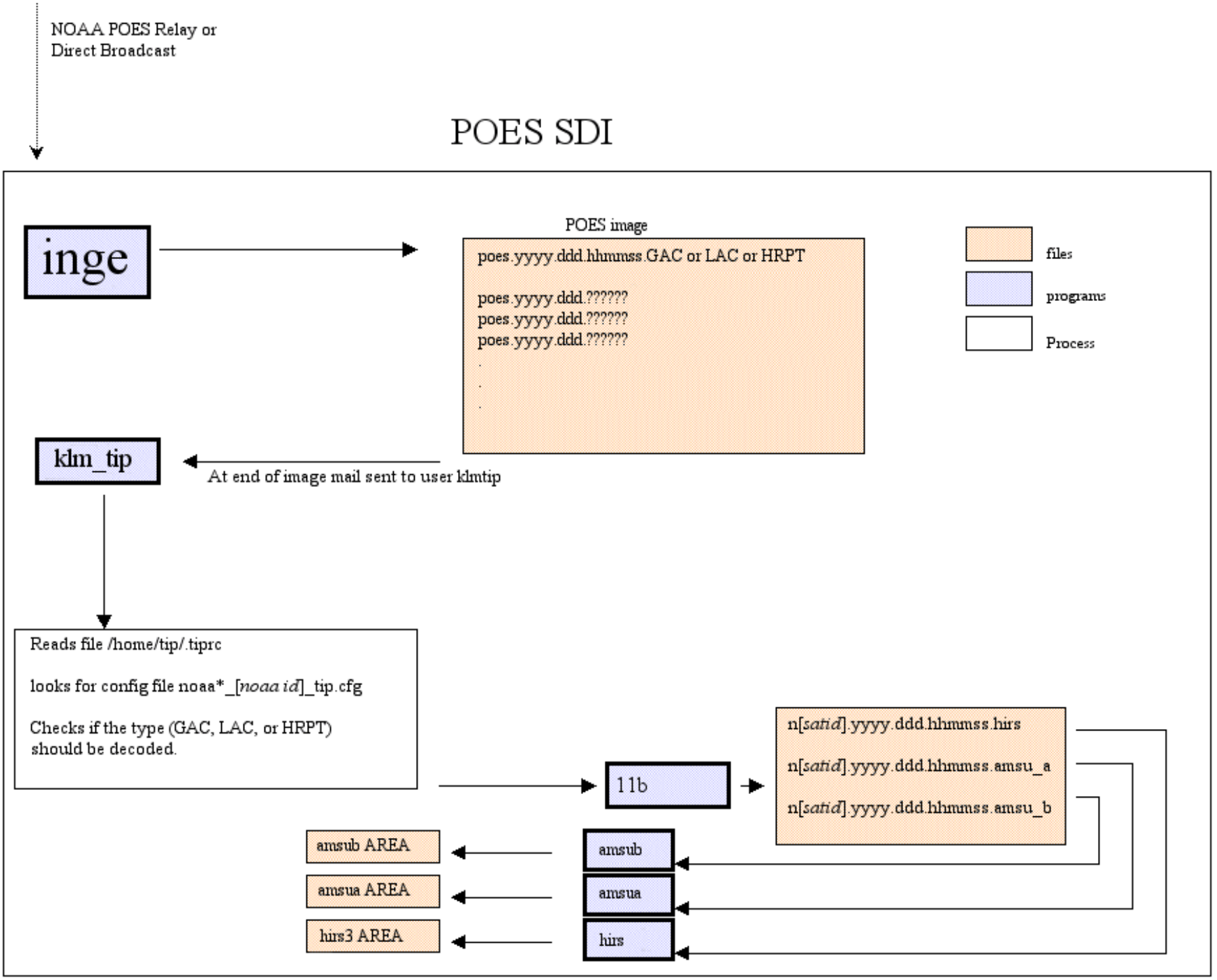
Decoding ATOVS Data

After an HRPT, GAC, or LAC pass finishes, the POES ingestor sends an e-mail event to all users in the event notifier list file, **`/data/notify.list`**. The user **`klmtip`** should be in**`/data/notify.list`**. The user **`klmtip`** is a mail alias that starts a script called **`/opt/tip/bin/klm_tip`**. This script reads the appropriate configuration files, and calls other scripts and programs to produce the final ATOVS areas. ATOVS areas are put into **`/home/tip`**. The Level 1b files are put into **`/data/l1b`**.

The first thing done by the **`klm_tip`** script is to read the configuration file **`/home/tip/.tiprc`**. This file sets up the environment and other defaults for the script. The **`klm_tip`** script reads the appropriate configuration file named **`noaa<`***sat#***`>_<`***noaaid#***`>_tip.cfg`** (e.g., **`noaa17_11_tip.cfg)`**. This configuration file has information about whether the file is to be decoded or not, and area ranges. The script **`klm_tip`** then runs the program **`/opt/tip/bin/l1b`** on the image referred to in the mail event message. This program creates three Level 1b files: a HIRS/3 file, an AMSU-A file, and an AMSU-B file. If areas are also to be generated, three more programs are run: **`amsua`**, **`amsub`**, and **`hirs`**. These programs create the areas and place them in the directory **`/home/tip`**.

The diagram below describes the flow of data to produce decoded ATOVS data.


NOAA POES Relay or
Direct Broadcast
POES SDI
inge
POES image
poes.yyyy.ddd.hhmmss.GAC or LAC or HRPT
poes.yyyy.ddd.??????
poes.yyyy.ddd.??????
poes.yyyy.ddd.??????
files
programs
Process
klm_tip
At end of image mail sent to user klmtip
Reads file /home/tip/.tiprc
looks for config file noaa*_[noaa id]_tip.cfg
Checks if the type (GAC, LAC, or HRPT)
should be decoded.
11b
n[satid].yyyy.ddd.hhmmss.hirs
n[satid].yyyy.ddd.hhmmss.amsu_a
n[satid].yyyy.ddd.hhmmss.amsu_b
amsub AREA
amsua AREA
hirs3 AREA
amsub
amsua
hirs

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ATOVS Decode Configuration Files

There are several configuration files needed for decoding ATOVS data. These files determine directories where the data resides, where areas are to be written, whether areas are to be written, etc.

The configuration file **/home/tip/.tiprc** provides information about where source data resides, where logging information is stored, and **PATH** and **MCPATH** information.

```
LOG_FILE=/home/tip/tip.log

DATADIR="/data"
PATH=$HOME/bin:/usr/bin:/usr/local/bin:/usr/openwin/bin:/opt/SUNWspro/bin

PATH=$PATH:/usr/ccs/bin:/usr/sbin:/opt/tip/bin:/home/mcidas/bin:.
export PATH

# MCPATH used by tip script
export MCPATH=/home/tip:/home/mcidas/data:/home/mcadde/mcidas/data/
```

The **/home/tip/noaa<***sat#***>_<***noaaid#***>_tip.cfg** configuration files contain general information for decoding POES ATOVS data. The current file that is shipped with POES SDIs set up to do ATOVS is named **/home/tip/noaa15_7_tip.cfg**.

The file contains the lines listed below, which identify the satellite number (`satnum` value), whether it is a NOAA-KLM series satellite (`NOAAKLM` value) and which data is to be decoded (`HRPT`, `GAC` and `LAC` values).

```
satnum=15
NOAAKLM=YES

# Set AREA loops for NOAA-15 AREAs
HRPT=NO
GAC=YES
LAC=NO
```

In the example above the satellite is NOAA-15, it is a NOAA-KLM series satellite, and only GACs are to be decoded.

The next part of this configuration file sets the number of Level 1b files to retain for each instrument type. It also defines the beginning and ending area numbers for each instrument.

```
# If no level1b files are to be retained,
# Comment out the following 3 lines
#
AMSUA_SAV=4
AMSUB_SAV=4
HIRS3_SAV=4

# If AREAs are not to be produced,
# Comment out the following lines
#
BEG_AMSUA=3001
END_AMSUA=3020

BEG_AMSUB=4001
END_AMSUB=4020

BEG_HIRS=5001
END_HIRS=5020
```

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Serving ATOVS Data

To serve the final ATOVS McIDAS areas, the file **~mcadde/mcidas/data/RESOLV.SRV** must reference the data. The directory storing the ATOVS areas must also be in the **MCPATH** of the server.

Configuring RESOLV.SRV

The datasets that the ATOVS data is served from should be set in the file **RESOLV.SRV**. The following is an example.

```
N1=POES,N2=N16AMSUA,TYPE=IMAGE,K=AREA,R1=3001,R2=3020,C=NOAA-16 AMSUA AREAS,
N1=POES,N2=N16AMSUB,TYPE=IMAGE,K=AREA,R1=3101,R2=3120,C=NOAA-16 AMSUB AREAS,
N1=POES,N2=N16HIRS,TYPE=IMAGE,K=AREA,R1=3201,R2=3220,C=NOAA-16 HIRS3 AREAS,
N1=POES,N2=N17AMSUA,TYPE=IMAGE,K=AREA,R1=3301,R2=3320,C=NOAA-17 AMSUA AREAS,
N1=POES,N2=N17AMSUB,TYPE=IMAGE,K=AREA,R1=3401,R2=3420,C=NOAA-17 AMSUB AREAS,
N1=POES,N2=N17HIRS,TYPE=IMAGE,K=AREA,R1=3501,R2=3520,C=NOAA-17 HIRS3 AREAS,
N1=POES,N2=N18AMSUA,TYPE=IMAGE,K=AREA,R1=3601,R2=3620,C=NOAA-18 AMSUA AREAS,
N1=POES,N2=N18AMSUB,TYPE=IMAGE,K=AREA,R1=3701,R2=3720,C=NOAA-18 AMSUB AREAS,
N1=POES,N2=N18HIRS,TYPE=IMAGE,K=AREA,R1=3801,R2=3820,C=NOAA-18 HIRS3 AREAS,
```

For detailed information about editing **RESOLV.SRV** see the section *Changing Server Dataset Names*.

Configuring .mcenv

The **MCPATH** setting in the file **~mcadde/.mcenv** also needs to contain the directory storing the area files. The following is an example.

```
MCPATH=$HOME/mcidas/data
MCPATH=$MCPATH:/home/tip
MCPATH=$MCPATH:~mcadde/mcidas/data

export MCPATH
```

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Chapter 5

Meteosat Ingestor

This chapter applies to the Meteosat PDUS High Resolution Information (HRI) signal only.

Topics discussed in this chapter are:
