GOES Ingest and NOAAPORT Interface
(GINI)

Program Maintenance Manual
(Documentation Version 1.6)

September 2005

Prepared for:
National Environmental Satellite, Data,
And Information Service,
Office of Satellite Data Processing and Distribution,
Satellite Services Division

Prepared by:
RS Information Systems
Last Revision: April 23, 2008

Table of Contents

Summary of Changes

The following is a list of documented version changes made to the Application software or manual process. Each insert in this section reflects a change in a sentence, paragraph or complete section.

Version 1.0 June 2001
Description: Original document version.

Version 2.0 Jan. 2002
Description: Modifications were made to this document to conform to SSD documentation standards and include information necessary to meet those standards.

1 How to Use This Manual

This manual was developed to provide an introductory overview of the system hardware, along with a detailed overview of internal operator setups and operations, and a comprehensive description reference intended for application program maintenance of the GOES Ingest and NOAAPORT Interface (GINI) software. It outlines and details many different aspects of the GINI software package, including its operational environment, installation, and processing algorithms. It is designed to serve many different levels of users.

1.1 Inside Each Chapter

Each chapter in this document gives the reader a different level of understanding into the procedures and operations of the GINI application software. Depending on the reader's current skill level and the depth in which the software is to be reviewed, each chapter was written not to force the reader to complete the entire document, but to focus in on those chapters which pertain to their requirements.

The opening three chapters outline the basic elements of the GINI software, including a description of the hardware and software environment under which this system runs. Chapter four describes installation procedures; chapter five describes the system design in detail, and chapter six describes the source code modules.

Details include process control, data flow, and required configuration files. They introduce the hardware and software knowledge required to install and to run the application system. These chapters also contain basic overview information about the internal operations of the GINI application software, and the various UNIX operating system it runs under. Chapters five and six detail the internals of the GINI system. These chapters describe the required external configuration files and some detail of underlying software algorithms needed for understanding the GINI system. Chapters seven and eight describe the administrative and operational routine maintenance performed by the GINI system administrators, system programmers, and application user operators.

Listed below are summaries of each chapter:

Introduction
Provides a brief summary of the GINI application system.

Operating Environment

Acquaints the reader with the hardware and software environment that support the GINI system, from both the administrative and programmer perspective.

Installation Procedures
Includes a detailed step by step method of installing the GINI application system software across the various UNIX processor workstations.

GINI Design Details
Includes detailed information about the Product Processing, including descriptions of process control, data flow, processing algorithms, and file formats.

GINI Program Documentation
Contains functional descriptions of the data, programs and shell scripts used in GINI processing.

Algorithms
Contains a detailed description of all algorithms used within the application to produce results that affect the output of the product.

Product Accuracy
Contains a description of tools and techniques used to monitor and validate the accuracy of the Product output

Appendices
Includes extraneous information regarding the application that is not found elsewhere within this document, such as data formats, acronyms.

1.2 References

The following is a list of references used to complete the GRIB1 decoder.

A*Data Acquisition Tables for System/Segment Specification (Type-A) AWIPS*". Published by the NWS Office of Meteorology, Technology and Forecast Systems, dated 23-April-1996. ***

A*GOES-I/M Sounder Derived Product Imagery (DPI)"*. Published by Curtis Holland of NESDIS/IPB.

1.3 Documentation Conventions

To help the reader locate and interpret information easily, this guide uses consistent visual cues and a standard command syntax. These conventions are explained as follows:

The caution symbol defines those parts of the guide that are flagged as special information. These are parts the reader should be aware of at all times. In most cases, ignoring text under the caution symbols may cause a GINI failure that may require a programmer or system administrator to correct.

The special note symbol defines those parts of the guide that are special points of interest.

These special notes help the reader understand why certain methods and processes have been used and alerts the readers attention to special comments made by the author.

The different typefaces displayed are used for the following purposes:

Italics In text, italics represent labels, placeholders, variables, and arrays, In syntax expressions, placeholders are set in italics to indicate that they are user-defined.

b In text, the subscripted "b" is used to represent a required space when entering a command.

Boldface Boldface is used in text for directive instructions, symbols and operators, as will as for command-line options.

CAPITALS In text, capital letters are used to represent instructions, directives, registers, and operators.

Monospace Monospace type is used to display any sample code.

1.4 How to Get Help

If there is a request for a GINI enhancement, or to report problems beyond the the scope of this manual, please call or write to the attention of GOES-SDDS Software Development Staff at:

RS Information Systems, Inc.
5200 Auth Road Suite, Suite # 506
Suitland, Md 20746
Phone: 301-763-8222
Fax: 301-763-4788
Email: SSDHelpdesk”noaa.gov

2 Introduction

The **G**OES **I**ngest and **N**OAAPort **I**nterface (GINI) System was originally conceived and specified by the National Weather Service (NWS) as one of the core components to their organizational modernization effort beginning in the 1990's. The NWS modernization called for upgraded replacement of their circa 1980's weather data processing systems (i.e., Radars, automated surface observation sensors, telecommunications infrastructure, field workstation systems, etc.) to revitalize and improve the nation's meteorological warning and forecast capability in the field. This modernization effort was called the Advanced Weather Information Processing System (AWIPS).

Central to this modernization concept was an advanced weather data processing system capable of supplying in real time, several predefined AWIPS sector/products in a digital format, consisting of remapped weather imagery derived from visible (VIS) and infrared (IR) channels of NOAAs newest generation of geostationary weather satellites. The first GINI system was a custom-built embedded processor computer system constructed on VMEbus technology. It was built to specific NWS requirements to generate AWIPS imagery products for digital distribution. The legacy GINI system was initially specified and implemented by the NOAA/NESDIS Information Processing Division (IPD), and ultimately operated and maintained by the NOAA/NESDIS Satellite Services Division (SSD).

As the new millennium approached, Year 2000 concerns were identified to SSD regarding the legacy GINI design in terms of operating system software Y2K compliance. Concerns were also raised about the increasing replacement cost and possible non-availability of specialized hardware for this custom-built system. Hence, in February of 1998, SSD obtained funding for a Y2K compliant rehost of the GINI functions onto a new COTS based system. New functional requirements were added to facilitate a system with improved:

performance;
logging;
data analysis;
product display; and
error correction capabilities;

The NESDIS/SSD management and their on-site contractor - (at that time, Litton/PRC, a company no longer in existence) - added the following needs to the scope of the GINI rehosted systems design objectives:

implement a rehosted system compatible with future ingest technology planned for this NESDIS facility; readily incorporate evolutionary satellite sensor changes; as well as a high degree of scalability at low levels of effort to include future satellite data streams, future remapped sector/product imagery requirements , multi-satellite composites, and integration of derived products.

In addition, GINI-2 incorporates remapped image design workarounds intended to compensate for navigation database earth model errors that were inadvertently implemented into fielded AWIPS operational display systems nationwide.

The SSD GINI Rehost Team was formulated in March of 1998. The rehosted system, now named GINI-2, became operational in September 1999. The transition onto the new system was implemented seamlessly with timely corrections of minor implementation anomalies, and a minimum of unforeseen design errors that adversely affected the delivered data products.

Today, the GINI-2 system offers increased hardware/software performance stability, faster product cycle throughput, improved human operator monitoring capabilities, enhanced satellite signal handling at the ingest front end, and a robust set of redundant backup configuration options within the ingest, network, and product process layers. It contains advanced vendor supplied software toolkits and support utilities to access, analyze, control, manipulate, and monitor all phases of the sector/product generation process from the stretched GVAR satellite data ingest through verification of product dissemination to the end user destination. When compared against previous systems, the GINI-2 system represents a significant improvement in data processing capabilities of GOES weather imagery data products delivered to AWIPS and to the National Weather Service.

2.1 GINI System Design Overview

The GINI system is an advanced weather data processing system capable of supplying in real time, several predefined AWIPS sector/products in a digital format. These products consist of remapped weather imagery derived from the visible (VIS) and infrared (IR) sensors of NOAAs current generation of geostationary weather satellites.

The GINI-2 is hosted on a Commercial-Off-The-Shelf (COTS) high performance UNIX-based computer data processing system. The GINI-2 actually consists of two major UNIX workstation systems that work independently, yet in parallel, with their attached peripheral equipment to effectively support concurrent Aon-line" and Abackup" operations on a continuous 24 hour basis. The division of GINI-2 into two parallel processing systems - an on-line operational system and an off-line backup system - necessitates the use a naming convention to distinguish between these two systems. Thus, the two major systems are simply called the NPORT systems - one is the NPORT-1 system, and the other is the NPORT-2 system. (See Figure 1-1. GINI-2 System Overview.)

Two McIDAS-based SSEC Desktop Ingestor (SDI) computer subsystems, a product from the University of Wisconsin Space Science and Engineering Center (SSEC), are attached onto each NPORT server. In total, there are four SDI ingest processors installed across the entire GINI-2 system. Two SDI processors are configured to ingest GOES-East and GOES-West data streams specifically for the NPORT-1 system, and two SDI processors are configured to ingest GOES-East and GOES-West data streams specifically for the NPORT-2 system.

Within the UNIX environment of each NPORT system, there exists two primary operational processing user accounts. One of these operational user accounts is dedicated to the processing of the GOES-East remapped sector/products for AWIPS, and the other operational user account is dedicated to the processing of the GOES-West remapped sector/products for AWIPS. In this manner, the use of two operational user accounts on each of the two NPORT systems allows the UNIX operating system to independently process the satellite data streams of GOES-East and GOES-West separately, yet efficiently, and without interference to each other.

Both of the NPORT systems, each operating independently and in parallel, ingest and process both GOES-East and GOES-West satellite data streams simultaneously. However, only the

individually selected NPORT system that is actually placed Aon-line" disseminates its processed imagery sector/products to the operational AWIPS Network Control Facility (ANCF) located in Silver Spring, Maryland. Both the GOES-East and GOES-West AWIPS image product streams are independently transmitted from the on-line NPORT system using File Transfer Protocol (FTP) services over dedicated T-1 circuits, which exist inside a closed communication network interconnecting the GINI-2 systems directly to the ANCF facility. In addition to the dedicated T-1 connections to operational AWIPS-NCF, there also exist additional network connections which can link either of the NPORT systems directly with the two other independent Network Control Facilities within the AWIPS constellation of NCF facilities. These additional NCF facilities include the Backup Network Control Facility (BNCF), located in Fairmount, West Virginia, and the Test Network Control Facility (TNCF) facility, which is located in McLean, Virginia.

Presently, each NPORT system maintains a 24 hour archive of every AWIPS sector/product that was successfully disseminated to the destination NCF, and also eight days of various system administration and product processing event logs. This archive of data and log files becomes useful when troubleshooting problems and anomalies retrospectively. Additional performance features of the GINI-2 include:

operator controlled switching of operational satellite data streams to enable alternate satellite data flow during anticipated outages, such as: satellite eclipse periods, scheduled satellite maintenance, satellite maneuvers, etc.

automation of File Transfer Protocol (FTP) error detection features and predefined recovery actions built into the product dissemination scripts;

a central menu display utility for human operator interaction; as well as support for additional user accounts intended for new software testing and maintenance purposes and for future new product testing and integration.

The GINI-2 software is written primarily in the AC" programming language and makes use of a number of control program scripts written in the UNIX Korn Shell script language. The initial versions of the GINI-2 application software programs were written quickly under tight time constraints, and may need to be improved in the future. For example, all of the initial versions of GINI-2 application software were written in a non-structured coding style with significant amounts of difficult to modify Agoto" programming. Therefore, as software enhancements and improvements are applied in the future, it is intended that all of the application software will eventually be rewritten to eliminate this legacy code, and incorporate modern structured programming coding conventions and constructs. This new application code will include the creation of new modular procedures targeted according to functionality. It is intended that eventually all former Agoto" programming will be eliminated and replaced by newly written application code, which will be easier to read and maintain, and which will be optimized for speed of efficient execution. In addition, as this legacy non-structured code is eliminated and replaced by structured programming enhancements , the improved application code will be implemented with the ultimate objective of making better advantage of the multitasking and multiprocessing capabilities that are inherent within the UNIX operating system environment.

[Insert]

Figure 1-1. GINI-2 System Overview

3 Operating Environment

3.1 Hardware Environment

[Updated July 2004 - Patrick Otero]

The baseline required hardware components for each NPORT system within the GINI configuration consists of the following stand alone equipment: two Dell PowerEdge 2500 Intel-based rack-mount workstations each used for satellite data ingests, and one SGI Origin 2000 RISC-based workstation to generate the GOES remapped imagery and sounder sector/products intended as final output to the AWIPS workstation destination.

The GINI-2 system actually consists of two completely independent, redundant, and identical processing systems. Each processing system is referred to as an NPORT system. Operational switching between these two NPORT systems is controlled manually by the computer operator at the click of a mouse button by selecting appropriate options specified within a menu-based TCL/TK display window. Each system is comprised of four networked inter-connected computer platforms:

(1) one SSEC Desktop Ingestor (SDI) computer (DELL PowerEdge 2500 Intel-based rack-mount workstation with a special SSEC ingest card) intended for the ingest processing of the stretched GVAR satellite imager data stream and sounder data stream from the current designated operational GOES-EAST satellite;

(2) a second SSEC Desktop Ingestor (SDI) computer (also a DELL PowerEdge 2500 Intel-based rack-mount workstation with a special SSEC ingest card) intended for the ingest processing of the stretched GVAR satellite imager data stream and sounder data stream from the current designated operational GOES-WEST satellite;

(3) one GINI/NPORT computer (Silicon Graphics Inc. Origin 2000 workstation with four CPU processors) intended as the main workhorse processor for image remap sector/product generation, sounder remap sector/product generation, and for the distribution of these AWIPS sector/products to a designated destination NCF facility;

(4) a single xterm display terminal front end computer (Silicon Graphics Inc. O2 workstation) which serves as the operator display interface to the SGI Origin 2000 computers.

In this documentation, the term ASDI" refers to the SSEC Desktop Ingestor processors, which is commercial product of the University of Wisconsin, Space Science and Engineering Center (SSEC).The sector/product remapping and product distribution server computer (Silicon Graphics Inc. Origin 2000) will be referred to simply as the NPORT system, of which there are two. Each one is described in this documentation as either the NPORT-1 system or the NPORT-2 system.

Each NPORT system consists of the following hardware:

one Silicon Graphics Inc. (SGI) "O2" UNIX-based workstation server with:

one 4 GB hard disk (primary),
one 4 GB hard disk (backup),
64 MB RAM,
one CD-ROM drive,
one 20 inch CRT display monitor, and
keyboard and mouse.

one Silicon Graphics Inc. (SGI) "Origin 2000" UNIX-based workstation server with:

eight 195 Mhz Central Processor Units (CPU),
256 MB RAM ,
9.1 GB System Disk,
one external SCSI Vault chassis containing five additional 9.1 SCSI system disks and one 8 GB SCSI DAT tape drive,
one CD-ROM drive,
an 8 GB SCSI2 DAT tape unit,
one 14 port SCSI XIO card, and
one additional Fast Ethernet network interface card

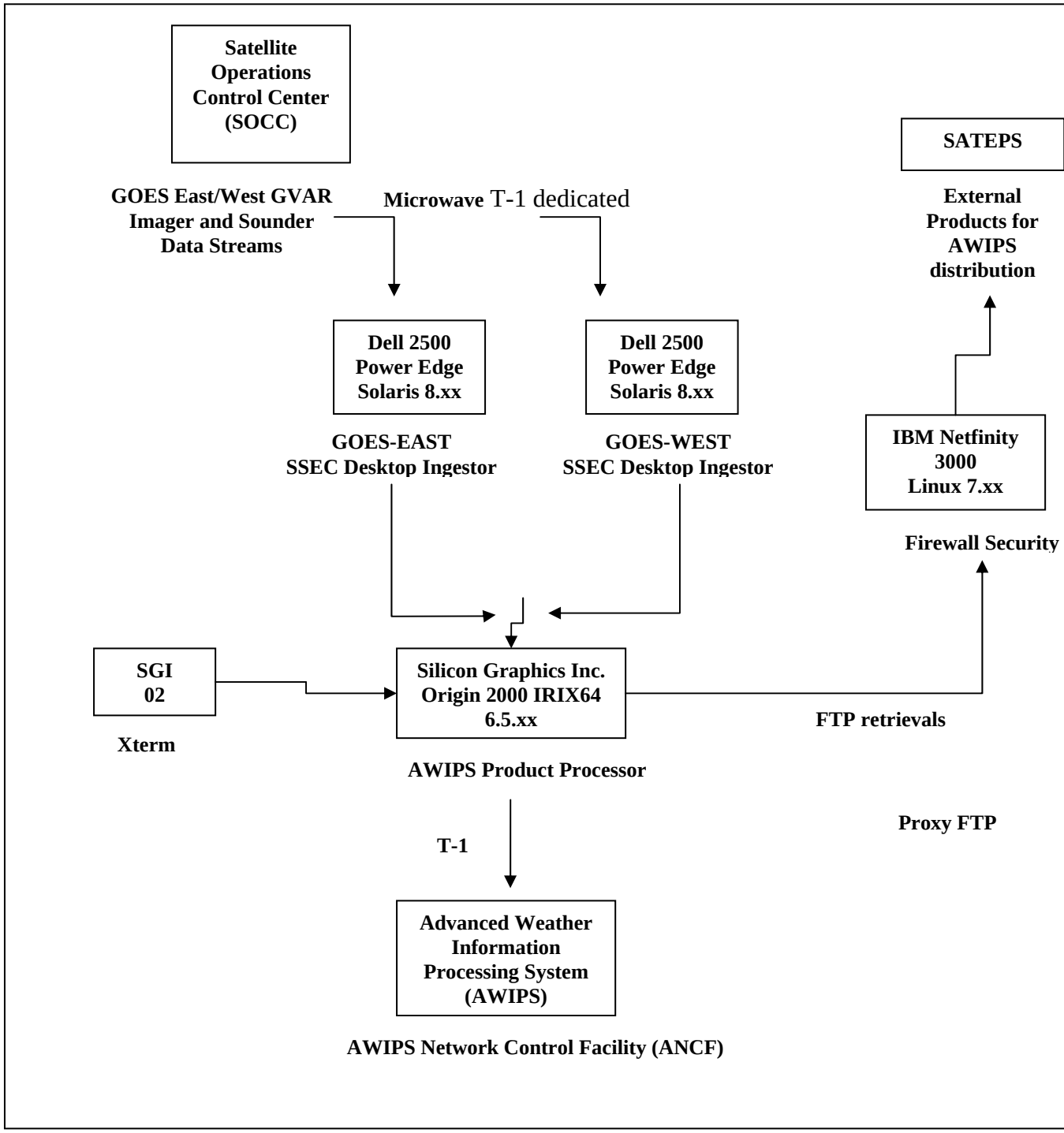
In addition, each NPORT contains an attached firewall hosted on an IBM Netfinity 3000 LINUX-based computer workstation. This firewall provides a secure protected interface to access external AWIPS products that are generated outside of the GINI-2 system. The firewalls on the GINI/NPORT systems are intended to comply with NWS network security requirements for all AWIPS mission critical equipment.

All SGI workstation equipment runs under the vendor supplied SGI IRIX64 operating system, which is the Silicon Graphics vendor supplied version of the standard UNIX operating system. Integral to the GINI-2 processing is the operating system environment known as the AMan-computer Interactive Data Access System" (McIDAS), a product purchased from the Space Science and Engineering Center (SSEC) at the University of Wisconsin. Future software upgrades to the SGI IRIX64 Operating System and to the McIDAS product will be applied routinely to the GINI-2 sub-system components in accordance with SSD operational standards.

Each of the NPORT systems on the GINI-2 is comprised of five network inter-connected computer platforms, which are: two SSEC Desktop Ingestors (SDI) platforms, one to receive GOES-EAST imagery data and one to receive GOES-WEST imagery data; one SGI Origin 2000 workstation; one SGI O2 workstation; and one IBM Netfinity 3000 workstation. The operating systems used for each of these component computers is shown below:

System Type	Operating System Software	Main Purpose

SDI GOES-EAST	Sun Solaris operating system	satellite data ingests
SDI GOES-WEST	Sun Solaris operating system	satellite data ingests
SGI Origin 2000	SGI IRIX64 operating system	main processor system
SGI O2	SGI IRIX64 operating system	operator terminal interface
IBM Netfinity 3000	Red Hat LINUX operating system	secure firewall


Satellite Operations Control Center (SOCC)
SATEPS
GOES East/West GVAR Imager and Sounder Data Streams
Microwave T-1 dedicated
External Products for AWIPS distribution
Dell 2500 Power Edge Solaris 8.xx
Dell 2500 Power Edge Solaris 8.xx
GOES-EAST SSEC Desktop Ingestor
GOES-WEST SSEC Desktop Ingestor
IBM Netfinity 3000 Linux 7.xx
Firewall Security
SGI 02
Xterm
Silicon Graphics Inc. Origin 2000 IRIX64 6.5.xx
FTP retrievals
AWIPS Product Processor
Proxy FTP
T-1
Advanced Weather Information Processing System (AWIPS)
AWIPS Network Control Facility (ANCF)

[Updated July 2005 - Patrick Otero]

In order to process GINI data, a minimum disk space of 2 Gigabytes is required:

Size of GINI I/O data sets

Dataset I/O Type	Hours	Disk Required
GVAR imager and sounder stretched input data	0.25 hour	365 Megabytes
Intermediate McIDAS data	0.25 hour	95 Megabytes
Output AWIPS product files	24 hours	650 Megabytes
Total		2.6 Gigabytes

3.2 Software Environment

[Updated January 2004 - Patrick Otero]

The GINI-2 functional application software can be grouped into four main category description blocks:

- ingest of GVAR stretched imager data and sounder data;
- McIDAS image remap sector/product generation;
- conversion of McIDAS areafile format into AWIPS required file form; and
- FTP dissemination of AWIPS sector/product to NCF destination.

A number of core AC" language code, Korn Shell scripts, and TCL/TK script modules are associated with each of the above four main functional category description groups. Underpinning all of the GOES image acquisition and image remapping processing application software is the McIDAS weather data processing environment, which executes under, and is supervised by, the Silicon Graphics Inc. (SGI) IRIX64 operating system software. IRIX64 is the vendor supplied SGI version of the standard UNIX operating system. The IRIX64 operating system uses X Window standards and conventions for handling Axterm" display windows in order to interface the software control environments to the human operator user.

The GINI-2 application software performs the overall AWIPS image sector/product processing, after first receiving the stretched GVAR satellite imager and sounder data from the SSEC Desktop Ingestor (SDI). This GINI-2 application software actually consists of four major software subsystems: (1) a mail message handler subsystem for the interpretation GOES ingest event processing subsystem based on a custom software design of interacting UNIX Korn Shell scripts and UNIX "C" language programs, (2) a GOES imager and sounder remap processing subsystem based on custom application software using many of the McIDAS software tools, (3) a conversion subsystem that performs the transformation of McIDAS imagery files into the required AWIPS image format, and (4) a transfer subsystem that controls the FTP dissemination of AWIPS sector/products to the NCF destination. In addition, there are two minor support subsystems that help interconnect and allow human interaction with the above GINI-2 functional software descriptions: (1) a custom built, TCL/TK software based, operator interface menu

display subsystem, which facilitates control of operator displays, operator commands, and quality control monitoring tasks to be used by the human operator, and (2) a hardware firewall server subsystem, which shields the closed AWIPS network from the open architecture of the SATEPS facility, but still allows a carefully controlled interface from inside the GINI/NPORT systems to the outside software environments.

The introductory explanation of GINI/NPORT data processing below describes the data flow processing of one satellite in the example descriptions. However, note there actually are two parallel and independent satellite data streams, one EAST and one WEST, which are being processed simultaneously.

3.2.1 Operating System

The base system hardware utilized by each NPORT application processing system consists of two major subsystems: (1) two DELL PowerEdge 2500 rack-mount workstations, which are configured as the SSEC Desktop Ingestor (SDI) computer subsystems, and (2) one SGI Origin 2000 IRIX64 workstation, which is the main workhorse processor subsystem.

3.2.1.1 Solaris Operating System

Each SSEC Desktop Ingestor (SDI) is configured to function under the following operating system software: the Solaris UNIX operating system, which is the SUN Microsystems, Inc., vendor specific variant of UNIX. Solaris - version 8.0 - is the current baseline operating system version installed on the SDI processors. This information is current as of December, 2002.

3.2.1.2 SGI IRIX64 Operating System

The SGI Origin 2000 IRIX64 workstation is configured to function under the following operating system software: the IRIX64 operating system, which is the Silicon Graphics, Inc., vendor specific variant of standard UNIX. IRIX64 - version 6.5.7m - is the current base operating system version installed on the SGI processors. This information is current as of December, 2002.

3.2.2 Programming Environment B TCL/TK

The four general functions are linked together using a customized menu display interface for routine human operator control, intervention, and monitoring of all GINI/NPORT processes. This menu display system consists of TCL/TK script modules custom built to support the GINI-2 operations. The TCL/TK programs are used for graphical user interface (GUI) displays.

3.2.3 Programming Environment B McIDAS

The Man computer Interactive Data Access System (McIDAS) is a software package developed, maintained, and supported by the Space Science and Engineering Center (SSEC). McIDAS core commands (primarily “C= and

"FORTRAN= source) are used within the GINI system for reading and processing McIDAS area files.

The McIDAS-X software environment is designed to run under a variety of powerful UNIX workstations. Functionality provided by McIDAS-X includes data management and data analysis that can support both meteorological operations and research. The McIDAS-X software package contains: real-time weather satellite data processing capabilities, conventional and enhanced storage and data transfer capabilites, and archival and retrieval capabilities for various types of related meteorological weather data. For more detailed information regarding McIDAS-X, the reader is referred to the McIDAS-X Users Guide and the McIDAS-X Learning Guide.

3.2.4 Programming Language B C

The C programming language is the primary language used withing the GINI system. This language promotes a robust set of varied control flow structures that support well developed structured programming conventions in a high level procedure oriented software language.

3.2.5 Programming Language B FORTRAN 77

The FORTRAN 77 language is well suited to applications that involve mathematical computations and other manipulation of arithmetic data. The language is not suitable for manipulating files and character data.

3.2.6 Programming Language B Shell Scripts

The UNIX Korn Shell (ksh) is used to execute UNIX commands in support of the GINI application data processing, such as through: background processes, FTP processes, and system administrative maintenance processes. The shell makes it possible to execute and control UNIX commands within a predefined batch environment.

3.2.7 Data Transfer/Communications

3.2.7.1 ADDE

The McIDAS McADDE client and server software (primarily "C= source) is used for indexing, copying, displaying and remapping imagery, ADDE is a client server based system running interactively with user application software under the supervision of the McIDAS operating system environment.

3.2.7.2 File Transfer Protocol (FTP)

The GINI system application software uses the standard

UNIX-based utility program, called File Transfer Protocol (FTP), as the designated means of disseminating the final sector/product data from the GINI real-time data processors to the remote servers of the destination Network Control Facility. FTP is specifically required by AWIPS as the preferred communications protocol for reliable transmission of files over the AWIPS closed private networks.

3.2.8 Support Software & Interfaces

Support software consists primarily of core McIDAS-X standard libraries. Some primary software groups used, are jobs to control batch commands, scripts, scheduling, and commands which do simple operations (display, list, etc.) on McIDAS-specific files (Area files).

3.2.9 Security

The GINI system and data are supported on a closed network. Access to the outside SATEPS facility systems is controlled through the IBM Netfinity 3000 Linux-based firewall system, which is implemented as part of AWIPS mandated security requirements. All data transfers from outside the SATEPS system into the internal GINI system occurs via FTP retrievals. The GINI system is further protected by restricted operator user accounts, which require password access. Authorized SATEPS operations staff personnel have access to these accounts. Periodic updating of user passwords for these accounts also maintains the integrity of the software and the data residing in these accounts.

In the future, software revision control will be administered using a standard UNIX Version Control Software (VCS) package yet to be determined. Use of this software package, in conjunction with frequent system tape backups, will ensure the integrity of the operational GINI system and software. At this time, there is no version control software package is in use on the GINI application software.

4 Compilation and Installation Procedures

[Updated July 2005 - Patrick Otero]

To ensure a one-to-one correspondence between application software source code and executables, it is advisable to compile the GINI application software on each of the NPORT system workstations independently. A Korn shell script can be invoked to compile all of the GINI application software on each NPORT system. This shell script resides in the source sub-directory (**~/mcidas/src**) under the appropriate operational user account, either “oper1" or “oper2", which are the operational processing accounts for GOES-EAST or GOES-WEST respectively. The name of this overall executable script is “compile.sh”.

4.1 Compilation

Executable Korn shell compile scripts are used for each individual application software component within the GINI application software. The individual compile scripts for each component of the GINI software are located in the ~/mcidas/src sub-directory. Each compile script file is made executable with the suffix “.make” appended to the script file name. Compiler optimization switches are used within the various compile scripts, thus providing limited optimization to the executables. In general, after compilation each application program executable is placed into the operational user account’s “bin” sub-directory for execution (**~/mcidas/bin**).

4.2 Makefile information

The GINI application does NOT use the standard UNIX “Make” utility program for application software development at this time. In future versions of the GINI application software, improvements and enhancements will be added to actually use the UNIX “Make” utility program, and to implement true standard UNIX “Makefile” constructs.

4.3 Directory Description

4.3.1 Required EAST Directories

Each of the NPORT systems **MUST** have the following directory and sub-directory structures resident for the entire GINI-2 application programs to function properly.

Summary of East processing directories and sub-directories needed for the “oper1" user account.

Directory Name	Description
/data1/eastcfg/	Contains configuration files possessing

	tailored information for all AWIPS core image product types.
/data1/eastdpisxfer/	Transfer directory for East external sector/products intended for AWIPS. When the status of the East FTP product dissemination shell is ACTIVE/ENABLED, any file appearing in this directory will be sent to the ANCF in a single FTP session.
/data1/eastflags/	Contains flags such as EAST operating mode (normal or alternate operations mode) and EAST FTP dissemination mode (enabled or disabled). Also contains the broadcast pass identifier flag files required for remap routines.
/data1/eastftpxfer/	Transfer directory for the GOES-East remapped sector/products imagery intended for AWIPS. When the status of the East FTP product dissemination process is ACTIVE/ENABLED, any file appearing inside this directory will be sent to the ANCF in a single FTP session.
/data1/eastlog/	Contains up to eight days of various system logs. The most current log does not contain a suffix. If today is julian day 304 the current FTP log would be called "ease_ftp_log.304" and yesterdays log would be designated as "east_ftp_log.303" and the day before that as "ftplog.302". Note that more logs reside in directory "/usr/people/oper1/mcidas/logs".
/data1/eastraw/	Contains the ingested McIDAS AREA files. See REDIRECT.BAT
/data1/eastrmap/	Contains McIDAS headers and McIDAS area files used for quality control purposes.
/data1/eastsent/	Contains latest products already sent to the destination NCF.
/data1/easttemp/	Contains temporary files such as AWIPS header files, data chunks, and trailer chunks.
/data1/sounder/goes_east/	Archive directory for the most recent EAST external sector/products sent the destination NCF.

/usr/people/oper1/	Contains the .profile file which is executed at login time and the .mcidasrc configuration file which is read by McIDAS when a McIDAS session is initiated.
/usr/people/oper1/mcidas/src/	Contains system source code for all "C" programs and most shell scripts, including startup scripts for the various subsystems.. The latest version of "main.o" must also reside in this directory for proper compilation of programs linked to MCIDAS to occur.
/usr/people/oper1/mcidas/data/	Contains McIDAS configuration files such as DATALOC.BAT, DSSERVEGER.BAT, and REDIRECT.BAT, the Tcl/Tk menu program ".menu__program", and various Korn shell McIDAS background programs (containing the prefix "gini_E_") which retrieve stretched GVAR satellite imagery data from the SDI ingestor using McIDAS "IMGCOPY" commands.
/usr/people/oper1/mcidas/logs/	Contains up to 8 days of various ingest related logs. The most current log does not contain a suffix. If today is julian day 304 the current EAST master log would be called "goesEmasterlog" and yesterdays log would be designated as "goesEmasterlog.303"and the day before that as "goesEmasterlog.302". Note that additional remap, FTP, and process debug logs reside in the "/data1/eastlogs/" and "/data2/westlogs/" directories. Also contains the ingest recover flag file logs used in the event of a problem with the mail queue file read (i.e., "/usr/people/oper1/mcidas/logs/goesE.recoverflag1").
/var/mail/	Contains the UNIX mail accounts, for the operational oper1 (EAST) and oper2 (WEST) users; mail accounts for test and operator development users; as well as standard users system mail accounts in the IRIX64 environment.

4.3.2 Required WEST Directories

Summary of West processing directories and sub-directories needed for the "oper2" user account.

Directory Name	Description
/data2/westcfg/	Contains configuration files possessing tailored information for all AWIPS core image product types.
/data2/westdpisxfer/	Transfer directory for West external sector/products intended for AWIPS. When the status of the West FTP product dissemination shell is ACTIVE/ENABLED, any file appearing in this directory will be sent to the ANCF in a single FTP session.
/data2/westflags/	Contains flags such as WEST operating mode (normal or eclipse operations mode) and WEST FTP operating mode (enabled or disabled). Also contains the broadcast pass identifier flag files required for remap routines.
/data2/westftpxfer/	Transfer directory for the GOES-West remapped sector/product imagery intended for AWIPS. When the status of the West FTP product dissemination process is ACTIVE/ENABLED, any file appearing in this directory will be sent to the ANCF in a single FTP session.
/data2/westlog/	Contains up to 8 days of various system logs. The most current log does not contain a suffix. If today is julian day 304 the current FTP log would be called "west_ftp_log.304" and yesterdays log would be designated as "west_ftp_log.303" and the day before that as "west_ftp_log.302". Note that more logs reside in directory "/usr/people/oper2/mcidas/logs".
/data2/westraw/	Contains the stretched GOES-WEST ingested McIDAS AREA files. See REDIRECT.BAT
/data2/westrmap/	Contains McIDAS headers and McIDAS areas used for image remap purposes.

/data2/westsent/	Contains latest products already sent to the destination AWIPS-NCF.
/data2/westtemp/	Contains temporary files such as AWIPS header files, data chunks, and trailer chunks.
/data2/sounder/goes_west/	Archive directory for the most recent WEST external sector/products sent the ANCF.
/usr/people/oper2/	Contains the .profile file which is executed at login time and the .mcidasrc configuration file which is read by McIDAS when a McIDAS session is initiated.
/usr/people/oper2/mcidas/src/	Contains system source code for all "C" programs and most shell scripts, including startup scripts for the various subsystems. The latest version of "main.o" must also reside in this directory for proper compilation with the McIDAS environment to occur.
/usr/people/oper2/mcidas/data/	Contains McIDAS configuration files such as DATALOC.BAT, DSSERVEGWR.BAT, and REDIRECT.BAT, the Tcl/Tk menu program ".menu__program", and various Korn shell McIDAS background programs (containing the prefix "gini_W_") which retrieve stretched GVAR satellite data from the SDI ingestor using the standard McIDAS "IMGCOPY" commands.
/usr/people/oper2/mcidas/logs/	Contains up to 8 days of various ingest related logs. The most current log does not contain a suffix. If today is julian day 304 the current WEST master log would be called "goesWmasterlog" and yesterdays log would be designated as "goesWmasterlog.303"and the day before that as "goesWmasterlog.302". Note that more remap, FTP, and process debug logs reside in the "/data1/westlogs" and "data2/westlogs" directories. Also contains the ingest recover flag file logs used in the event of a problem with the mail queue file read.(i.e., "/usr/people/oper2/mcidas/logs/goesW.recoverflag1").
/var/mail/	Contains the UNIX mail queues for each

user account created on the system. The users are oper1 (for EAST processing) and oper2 (for WEST processing) users. Two other mail queues found here will be for the users oper and operator.

4.4 System Configuration

4.4.1 Redirects

[Updated July 2005 - Patrick Otero]

The McIDAS session is configured via several McIDAS BATCH files. The DATALOCGER.BAT file (..GWR for WEST) configures the locations of ADDE servers, the REDIRECTGER.BAT file (..GWR on WEST) configures the location of various McIDAS stretched GVAR satellite data ingests and processed area files, and the DSSERVEGER.BAT file (..GWR.BAT for WEST) configures the available local and processed area ranges.

To configure GOES-East McIDAS account enter the following commands at the McIDAS prompt window as user oper1:

BATCH ADATALOCGER.BAT
BATCH AREDIRECTGER.BAT
BATCH ADSSERVEGER.BAT

To configure GOES-West McIDAS account enter the following commands at the McIDAS prompt window as user oper2:

BATCH ADATALOCGWR.BAT
BATCH AREDIRECTGWR.BAT
BATCH ADSSERVEGWR.BAT

The contents of these files can be found in the appendix. Current policy dictates that whenever a change is made using the DATALOC, DSSERVE, or REDIRECT commands that the appropriate BAT file also be updated. Keeping these files current prevents confusion/outages when a critical McIDAS system file needs to be recreated from scratch.

4.4.2 Symbolic Links

[Updated July 2005 - Patrick Otero]

The following symbolic link, within the GINI application software, is required for the operator menu sub-system to function properly on the NPORT display screens.

When McIDAS on the EAST GINI-2 is initiated, McIDAS reads the "/usr/people/oper1/.mcidasrc" file to set McIDAS resources. On the WEST GINI-NPORT system McIDAS reads the "/usr/people/oper2/.mcidasrc" file to set McIDAS environment resources. Two modifications to the default .mcidasrc file are implemented for the GINI-2 system.

To alter the "/usr/people/oper1/.mcidasrc= file search for the occurrence of
-c GUI
and replace with
#-c GUI
Commenting the GUI line out disables the GUI interface.

The second modification to ".mcidasrc" entails the addition of a line to automatically boot the custom TCL/TK menu system when McIDAS starts.

To alter the file "/usr/people/oper1/.mcidasrc" (for East) and "/usr/people/oper2/.mcidasrc" (for WEST) search for the occurrence of
-c "SKED SKEDFILE"
and add the following line immediately below it
-c "MENU"

When the McIDAS environment executes this line, it runs the "MENU" program located in the "/usr/people/mcidas/data" directory. Note that all the menu programs and configuration files, including ".menu__program", ".menu__config", and ".menu_loopdefDEFAULT", must be resident in the directories "/usr/people/oper1/mcidas/data" (for East) and "/usr/people/oper2/mcidas/data" (for WEST). The "MENU" program is merely a simple McIDAS macro which executes the program "/usr/people/oper1/mcidas/data/menu" which is set up as a UNIX symbolic link pointing to the actual Tcl/Tk ".menu__program" menu program.

To create this link enter the following UNIX command:

ln -s .menu__program menu

Make sure that ".menu__program" has execute permissions 755.

4.4.3 UNIX Configurations

Several UNIX configuration files are needed to ensure proper cleanup of log files in the system. The GINI-2 system produces eight types of log files of which seven days are kept online at any given time. In order for proper cleanup to occur the following entries in the system crontab facility are required:

43 23 * * * /usr/people/mcidas/bin/clear_log_east.sh "
/usr/people/mcidas/src/sdilogclean.out 2>&1
43 23 * * * /usr/people/mcidas/src/throttle.sh "
/usr/people/mcidas/src/throttle.out 2>&1

To list the oper1 or oper2 user account crontab definitions use the command:
crontab -l

To configure crontab place crontab entries in a file such as “crontab.def= and then enter the UNIX command “crontab crontab.def=.

Note that both shell script “clear_log_east.sh” and “clear_log_west.sh” are executed once per day at approximately 2343Z. The reason this time was chosen is because it is mostly during idle time when imagery is not being ingested or processed. The “clear_log_east.sh” and “clear_log_west.sh” shell scripts are vital to keep the number of application software system and program logs pruned to manageable sizes. Current policy is to save the last 8 days worth of past logs, but this may be changed is desired. The “throttle.sh” script serves no purpose in the current operational application software. However, it was used to clean various quality control mail accounts from becoming too large in the legacy software code. Seven past days of mail logs are available, along with the current day. Proper crontab entries are critical to avoid disk full errors which could impact GINI-2 operations adversely.

4.4.4 McIDAS Configurations

File Name	Description
.mcidasrc	McIDAS session initialization file.
DATALOCGER.BAT	McIDAS BATCH file which defines GOES-East McADDE server locations via DATALOC commands. **NOTE** *unique file contents across all platform accounts.*
DATALOCGWR.BAT	McIDAS BATCH file which defines GOES-West McADDE server locations via DATALOC commands. **NOTE** *unique file contents across all platform accounts.*
DSSERVEGER.BAT	McIDAS BATCH file which defines GOES-East McADDE area groups (ranges) via DSSERVE commands.
DSSERVEGWR.BAT	McIDAS BATCH file which defines GOES-West McADDE area groups (ranges) via DSSERVE commands.

REDIRECTGER.BAT	McIDAS BATCH file which defines GOES-East file system locations for various area numbers via REDIRECT commands.
REDIRECTGWR.BAT	McIDAS BATCH file which defines GOES-West file system locations for various area numbers via REDIRECT commands

4.4.5 McIDAS Settings – DSSERVE

[Updated January 2005 - Patrick Otero]

The McIDAS session is configured via several McIDAS BATCH files. The DATALOCGER.BAT file (..GWR for WEST) configures the locations of ADDE servers, the REDIRECTGER.BAT file (..GWR on WEST) configures the location of various McIDAS stretched GVAR satellite data and processed area files, and the DSSERVEGER.BAT file (..GWR.BAT for WEST) configures the available local and processed area ranges.

To configure GOES-East McIDAS account enter the following commands at the McIDAS prompt window as user oper1:

BATCH “DATALOCGER.BAT
BATCH “REDIRECTGER.BAT
BATCH “DSSERVEGER.BAT

To configure GOES-West McIDAS account enter the following commands at the McIDAS prompt window as user oper2:

BATCH “DATALOCGWR.BAT
BATCH “REDIRECTGWR.BAT
BATCH “DSSERVEGWR.BAT

The contents of these files can be found in the appendix. Current policy dictates that whenever a change is made using the DATALOC, DSSERVE, or REDIRECT commands that the appropriate BAT file also be updated. Keeping these files current prevents confusion/outages when a critical McIDAS system file needs to be recreated from scratch.

4.4.6 McADDE Configurations

The following McADDE configurations should be in place before the GINI

application software is executed to perofrm the ingest processing. The McIDAS session is configured via several McIDAS BATCH files. The DATALOCGER.BAT file (..GWR for WEST) configures the locations of ADDE servers, the REDIRECTGER.BAT file (..GWR on WEST) configures the location of various McIDAS stretched GVAR satellite data and processed area files, and the DSSERVEGER.BAT file (..GWR.BAT for WEST) configures the available local and processed area ranges.

To configure GOES-East McIDAS account enter the following commands at the McIDAS prompt window as user oper1:

BATCH “DATALOCGER.BAT
BATCH “REDIRECTGER.BAT
BATCH “DSSERVEGER.BAT

To configure GOES-West McIDAS account enter the following commands at the McIDAS prompt window as user oper2:

BATCH “DATALOCGWR.BAT
BATCH “REDIRECTGWR.BAT
BATCH “DSSERVEGWR.BAT

The contents of these files can be found in the appendix. Current policy dictates that whenever a change is made using the DATALOC, DSSERVE, or REDIRECT commands that the appropriate BAT file also be updated. Keeping these files current prevents confusion/outages when a critical McIDAS system file needs to be recreated from scratch.

4.5 Network Configurations

[Updated January 2003 - Patrick Otero]

The GINI workstation components are interconnected within a closed computer network. The GINI network configurations on each NPORT system are maintained and administered by the system administration personnel, and requires Aroot” privileges. Therefore, the GINI network configuration cannot be modified by the system programmer staff personnel, nor by the SATEPS operations staff personnel.

The network configurations of each NPORT system is contained within the configuration file called “/etc/hosts”. In order to comply with National Weather Service and AWIPS computer network system administration security requirements, the contents of this configuration file is specifically not listed within this document. Controlled access to view the contents of this file requires operator password privileges.

The GINI network can be configured specifically for dissemination of AWIPS sector/products in order to support operations with any one of the three Network Control Facilities (NCF). These three Network Control Facilities consist of:

(1) the AWIPS NCF, located in Silver Spring, Maryland
(2) the Backup NCF, located in Fairmont, West Virginia
(3) the Test NCF, located in McLean, Virginia.

Normally, the implementation, control, and modification of the GINI network requires Aroot access" system administration privileges. Therefore, the system programming staff and the SATEPS operations staff are not allowed to modify the GINI network configuration. However, the reconfiguration of the GINI network to enable communications to any one of three NCF facilities is extended to the SATEPS operations staff using a special designated Aoperator" user account created for this purpose. Modification capability to reconfigure the GINI network requires operator password access, and is controlled under the Asudo" command structure. The Asudo" commands implemented on the GINI system software will allow limited access to specifically designated executable scripts, which were previously written to modify and control the GINI-to-NCF network connections in predetermined configurations. The GINI operator procedure that invokes these designated executable scripts is included within the appendix of this GINI Program Maintenance manual.

4.6 Application-Specific Files

[Updated January 2003 - Patrick Otero]

The following libraries, include files, header files, and other shared files are necessary when compiling and linking the GINI application software to the current McIDAS environment.

4.6.1 Libraries

There are three standard McIDAS library files that are used when performing a compile and link of the GINI application software to McIDAS environment. These three library files are: "libmcidas.a" and "libmcold.a" and "libsdi.a". These library files reside in the sub-directory ~/mcidas/lib/ under the operational user account name of either "oper1" or "oper2" for the processing of GOES-EAST or GOES-WEST data respectively.

4.6.2 Include Files

There are no custom include files required to compile the GINI application software.

4.6.3 Header Files

The standard UNIX C library, which is part of the Silcon Graphics Inc. IRIX64 vendor supplied UNIX operating system, provides all necessary header files to compile any and all components of the GINI application software.

4.6.4 Other Shared Files

The McIDAS operating system environment utility programs and data files are shared across both the oper1and oper2 user accounts for the processing of the GOES-EAST and GOES-WEST data streams respectively. All McIDAS shared programs and data files reside in only one common directory named, "/usr/people/mcidas/".

4.7 Installation of Software and Data

The McIDAS operating system software environment is installed on GINI computer workstation platforms using standard UNIX distribution techniques and SSEC recommended procedures. These McIDAS standard installation procedures are followed explicitly in order to install the McIDAS environment properly. There are no special external data files that require installation on the GINI computer platforms.

4.7.1 Compilation and Make Files

Summary Descriptions of "Source code compilation" files and "make" files:

Please note that the following executable files are NOT standard "makefiles" as normally used and described in the modern UNIX operating system environment, and they DO NOT follow the standard UNIX "make" utility program conventions in implementation nor in execution. These are simple batch files, which are in themselves executable and standalone, and they will invoke the vendor supplied UNIX "cc" compiler directly to create the desired executable application program

File Name	Description
compile.sh	UNIX Korn shell script to compile all application software code under one of the operational user account names, either "oper1" or "oper2".
areadate.make	UNIX Korn shell script to compile "C" program "areadate.c"
calibrate.make	UNIX Korn shell script to compile "C" program "calibrate.c"
dumpaa.make	UNIX Korn shell script to compile "C" program "dumpaa.c"
dumpgini.make	UNIX Korn shell script to compile "C" program "dumpgini.c"

ftpchunk.make	UNIX Korn shell script to compile “C” program “ftpchunk.c”
ftptime.make	UNIX Korn shell script to compile “C” program “ftptime.c”
ftptrailer.make	UNIX Korn shell script to compile “C= program “ftptrailer.c”
goesE.make	UNIX Korn shell script to compile “C= program “goesE.c”
goesW.make	UNIX Korn shell script to compile “C= program “goesW.c”
ginifill.make	UNIX Korn shell script to compile “C= program “ginifill.c=
ginifill2.make	UNIX Korn shell script to compile “C= program “ginifill2.c=
ginirmap.make	UNIX Korn shell script to compile “C= program “ginirmap.c=
mc2awips.make	UNIX Korn shell script to compile “C= procram “mc2awips.c=
menu.make	UNIX Korn shell script to compile McIDAS MACRO program “menu.mac=
sdiqc.make	UNIX Korn shell script to compile McIDAS MACRO program “sdiqc.mac=
xdump.make	UNIX Korn shell script to compile “C= program “xdump.c=

4.7.2 Installation Procedures

[Updated January 2003 - Patrick Otero]

There is no installation procedure for the GINI application software. If the software needs to be transferred to another machine for testing or other purposes, then the system administrator or system programmer simply invokes the standard

UNIX tar commands to create a copy of the desired software. The tar file can then be transferred to the new destination machine. The standard UNIX tar commands will be invoked again to then copy the original software files into their new resident directories on the new machine. This is the extent of GINI application software installation procedures.

5 Product Process Descriptions

5.1 Product Processing

The GOES satellite data ingest subsystem consists of software interfaces between two interconnected hardware platforms. The first component is the SSEC Desktop Ingestor (SDI) stretched satellite data ingest platform. It is hosted on a DELL PowerEdge 2500 (with a specialized SSEC ingest card) running under the Sun Solaris operating system and using McIDAS McADDE server software that works in conjunction with the Solaris version of the UNIX sendmail message processing software. The second component is the custom built mail message application software that performs the image retrieval process. This component resides on the SGI Origin 2000 running under the Silicon Graphics IRIX64 operating system and also uses the McIDAS McADDE client software for efficient data transfer of GVAR imagery.

The GOES SSEC Desktop Ingestor (SDI) workstation servers function as a major subsystem. Each SDI server, running under the McIDAS operating system environment and various specialized AC" language and FORTRAN language ingest routines, performs the stretched GVAR satellite data ingests, indexes the data into a McIDAS ADDE compatible format, and integrates with UNIX sendmail functions to communicate image data availability to McADDE clients. The SDI workstation is a standalone component which functions independently of all other subsystems.

5.1.1 Dissemination Priorities

The FTP dissemination task disseminates all AWIPS sector/products in a predefined priority order. This priority scheme is dictated by National Weather Service requirements. When there are no AWIPS image sector/products to transfer, the dissemination script will acquire and disseminate external products. This priority scheme ensures that AWIPS imagery will always be disseminatd before less important external products. Thus, external products will never interfere with the timely dissemination of AWIPS imagery.

After a sector/product is successfully disseminated to the destination NCF, it is then saved into a designated archive directory and retained for a 24 hour period. The FTP dissemination product script also handles the removal of old data from the archive directories. This continuous save/remove archiving process is event driven by the incoming data, and ensures that the archive directories never hold data older than 24 hours. Thus, the archive directories are always self maintained at a constant capacity.

5.1.2 Operator Interface

The McIDAS image display and operator command menu subsystem is a McIDAS session which allows SATEPS operators to submit McIDAS commands for displaying images, viewing configurations, and performing

quality control functions. On startup a McIDAS session is started including both the image display xterm display window, and the McIDAS command prompt xterm display window. The McIDAS bootup configuration file contains a command to startup the custom TCL/TK menu subsystem via the McIDAS command "MENU=. The McIDAS session is configured using several McIDAS BATCH files. The DATALOC.BAT file configures the locations of ADDE servers, the REDIRECT.BAT file configures the file system locations of various McIDAS stretched and processed area files, and the DSSERVE.BAT file configures the available local and processed area McADDE group names. **Of importance to note here** are the unique contents of the DATALOC batch file with respect to source East and West ingest IP addresses. *These are **not the same** across East and West accounts on the same machine; and they are **not the same** across East and West accounts on differing machines.* **Each DATALOC sdi-ingestor IP address is uniquely specific for every individual GINI-2 account.**

The custom TCL/TK menu minor subsystem is a Tool Control Language/Toolkit (TCL/TK) program which enables the SATEPS operator to point and click mouse functions on a variety of options/commands displayed in a scrollable text window. The TCL/TK language is a popular UNIX-based interpreted language which allows the developer to build a simple graphical user interface (GUI) tied to various actions in an X-Windows environment. The menu subsystem was previously built for another application and adapted for this project. The menu subsystem consists primarily of a main program".menu__program= and a configuration text file ".menu__config= which can be easily altered using standard UNIX text editors to modify, add, or delete options.

The menu system main program reads the menu system configuration file and displays the configured options to the user. Menu options can be tied to a variety of actions including execution of single McIDAS commands, McIDAS BATCH files, multiple McIDAS commands, UNIX Korn Shell scripts, and UNIX system commands. Output can be directed to the McIDAS command window, or to a popup shell display window. Menu selectable options include several operational scripts to switch satellite processing mode (between normal or alternate), to switch FTP dissemination operations between SGI Origin 2000 processor systems, to display the latest McIDAS-formatted images sent to the destination NCF, to debug McIDAS area directory and AWIPS header formats, to view directory listings of McIDAS area files, to view eight types of logs (maximum of seven days of log files are available), and to perform various system quality control tasks such as CPU monitoring, system process monitoring, disk usage monitoring, and network monitoring. **Of importance to note here in the East and West TCL/TK file contents are the differing mail files related to satellite switching/reset mail accounts (and use id=s). East and West processing accounts *are unique within the same NPORT system,* but identical across both NPORT systems.**

GOES-EAST Sector/Products required for AWIPS .

	GOES-EAST B Simple Sectors	Map Projection
1	ECONUS B East Conus	Tangent Cone
2	PRNATL B Puerto Rico National	Polar Stereo
3	PRREGL B Puerto Rico Regional	Mercator
	GOES-EAST B Composite Sectors	**Map Projection**
4	SUPERN B East Super National	Polar Stereo
5	NHEMI B East Northern Hemisphere	Polar Stereo

[Updated January 2003 - Patrick Otero]

GOES-WEST Sector/Products required for AWIPS .

	GOES-WEST B Simple Sectors	Map Projection
1	WCONUS B West Conus	Tangent Cone
2	AKNATL B Alaska National	Polar Stereo
3	AKREGL B Alaska Regional	Polar Stereo
4	HWNATL B Hawaii National	Mercator
5	HWREGL B Hawaii Regional	Mercator
	GOES-WEST B Composite Sectors	**Map Projection**
7	SUPERN B West Super National	Polar Stereo
8	NHEMI B West Northern Hemisphere	Polar Stereo

5.2 Processing Time

[Updated January 2003 - Patrick Otero]

The GINI application software is invoked for each GOES satellite data image broadcast and received. The application software is event driven, and therefore, the GINI application software will generate as many remaps as can be derived from within the quadrant broadcast area from the satellite data stream. Each data period is unique and different. Different size satellite broadcast quadrants will result in different levels of required processing time. The GINI processing times shown in the table below are general average times that may be observed and expected. The times shown in the table below actually overlap since different processes can occur simultaneously and concurrently. In other words, in many cases the application software can begin the next subsequent process before the previous process is totally completed. There is no difference in the remap processing that is invoked for the processing of a FULL DISK image quadrant versus a small RSO quadrant. It is the same remap process.

Average processing time for GINI application system (times overlap)

Transfer of EAST stretched data files from SDI	onds
Transfer of WEST stretched data files from SDI	220 seconds
Processing time for EAST McIDAS remap	160 seconds
Processing time for WEST McIDAS remap	240 seconds
Convert East McIDAS remap to AWIPS file	30 seconds
Convert WEST McIDAS remap to AWIPS file	30 seconds
EAST sector/product dissemination to AWIPS	30 seconds
WEST sector/product dissemination to AWIPS	30 seconds
Average total time required (fastest possible) *Total time budgeted*	3.8 minutes *15 minutes*

After a sector/product is successfully disseminated to the destination Network Control Facility (NCF), it is then saved into a designated archive directory and retained for a 24 hour period. The FTP dissemination product script also handles the removal of old data from the archive directories. This continuous save/remove archive process is event driven by the incoming data, and ensures that the archive directories never hold data older than 24 hours. Thus, the archive directories are always self maintained at a constant capacity.

To summarize, the total CPU usage for processing 24 hours of GOES data via the GINI application system is approximately 20 minutes.

5.3 Control of Data Processing

The processing performed by the GINI-2 system occurs as four main functions:

- GOES satellite stretched GVAR data ingest;
- McIDAS image remap transformation;
- AWIPS compatible format conversion; and
- FTP sector/product dissemination.

Each stage is described in details in the next section.
(See also Appendix A: GINI Data Processing Flow Diagram)

5.3.1 Satellite Ingest Process

The GOES-East mail message processing and image retrieval platform (SGI Origin 2000) utilizes McIDAS McADDE "IMGCOPY= commands to retrieve the stretched GVAR data stream in a timely manner from the SDI workstation server. At image frame start, when valid stretched GVAR data begins flowing into the SDI ingestor, the image corner points and image times are transmitted from the SDI ingestor to the SGI Origin 2000 using standard UNIX mail message command.

The GOES-East satellite ingest subsystem consists of software on two distinct hardware platforms, an SDI satellite ingestor platform (DELL 2500 Poweredge) with the Sun Solaris UNIX operating system, and using the SDI McIDAS McADDE server software and a mail message processing and image retrieval platform (SGI Origin 2000) with the IRIX64 UNIX operating system utilizing McIDAS McADDE client software.

The SDI satellite ingestor major subsystem consists of specialized "C=, FORTRAN, McIDAS, and UNIX sendmail code which ingests stretched GVAR satellite data, indexes the data in a McIDAS ADDE compatible format, and advertises sector availability to McADDE clients. The SDI ingestor is a standalone component which functions independently of all other subsystems.

The mail message processing and image retrieval platform (SGI Origin 2000) utilizes McIDAS McADDE "IMGCOPY= commands to retrieve the stretched GVAR data stream in a timely manner from the SDI ingestor. At image frame start when valid stretched GVAR data begins flowing into the SDI ingestor, the image corner points and image times are transmitted from the SDI ingestor to the SGI Origin via the UNIX sendmail command. A special UNIX Korn shell task on the SGI Origin "goes_east.sh= monitors the email account, processes any incoming email messages and passes the image corner points to a "C= program "goesE.c (executable goesE.exe)=. The "goesE.exe= program determines what type of stretched GVAR data stream area quadrant is being ingested and executes multiple McADDE "IMGCOPY= commands to retrieve desired stretched McIDAS segments into production area file ranges. Both the

“goes_east.sh= and “goesE.exe= programs execute as nohup background UNIX tasks and are independent of all other subsystems.

5.3.1.1 SSEC Desktop Ingestor (SDI) Systems

The GOES satellite data ingest subsystem consists of software interfaces between two interconnected hardware platforms. The first component is the SSEC Desktop Ingestor (SDI) stretched image data ingest platform. It is hosted on a DELL PowerEdge 2500 (with a specialized SSEC ingest card) running under the Sun Solaris operating system and using McIDAS McADDE server software. The second component is the Solaris version of the UNIX sendmail message processing software, and image retrieval process resident on the SGI Origin 2000 running under the Silicon Graphics IRIX64 operating system and also using McIDAS McADDE client software.

The GOES SSEC Desktop Ingestor (SDI) workstation servers function as a major subsystem. Each SDI server running under the McIDAS operating system environment and various specialized AC” language and FORTRAN language ingest routines, performs the stretched GVAR satellite data ingests, indexes the data into a McIDAS ADDE compatible format, and integrates with UNIX sendmail functions to communicate image data availability to McADDE clients. The SDI workstation is a standalone component which functions independently of all other subsystems.

Four redundant SSEC Desktop Ingestor (SDI) systems supply GOES-East and GOES-West stretched GVAR satellite imagery data streams to the GINI/NPORT systems. Specialized ingest system cards take in GVAR bit-synchronized NRZ-S clock and data broadcast signals, add frame sync, and block the resultant information into consecutive files on 1 MB boundaries on disk under the “~/data” directory. Corresponding Index files are also generated which relate the 1 MB files and their contents to particular Imager and Sounder broadcast passes for subsequent creation of McIDAS area files and ADDE data access and retrievel. Each SDI sends out notifications of Imager broadcast pass starts, and Sounder pass start/end notifications through the use of the UNIX sendmail utility. Typical Imager and Block_11 (BK11) or Sounder ingest mail message formats are presented below:

gvar.JDccyyddd.N-corner S-corner W-corner E-corner etc

(Sent for Imager at the detection of each pass start only)

bk11.JDccyyddd.N-corner S-corner W-corner E-corner etc

Block-11 pass start:

bk11.JDccyyddd . End of frame
Block-11 pass end:

There are several important directories and files associated with the SDI ingestors.
Under the directory " ~mcadde/mcidas/data" :

RESOLV.SRV (ingestor side set up of ADDE group names and descriptors, data type, data (/satellite) format, beginning and ending range positions, and comment field identifier.

DSSERVE.BAT (sets up ADDE group and bands on the server and client sides)

REDIRECT.BAT (sets up or masks area files or ranges to target disk directory sources)

DATALOC.BAT (links remote server network IP addresses to group names)

Under the directory "/data":

names.gvar (sets up group sectors such as FD, NH, etc., by corner boundaries)

names.bk11 (sounder ranges)

Important Mail files are:

notify.list < oper1 primary file is east1, oper2 primary file is west1, oper1 secondary file is west, oper2 secondary file is east, with 3 qc Aredundant" check files: qc1 (oper1-east check), qc2 (oper2-west check), and oper3 (development/admin account check)

SDI software upgrades included the following:

One mod for Y2K bug fix
/home/mcadde/mcidas/bin/aput.serv

rfi (slowdown) correction
/home/mcadde/mcidas/bin/gvaraget
/home/mcadde/mcidas/bin/gvardir

The most useful commands pertaining to SDI Ingest operation include the following:

Imager stop and startup commands:

/etc/init.d/ingcntl.stop
/etc/init.d/ingcntl.start

Sounder stop and startup commands:
/etc/init.d/sndcntl.stop
/etc/init.d/sndcntl.start

~/data (1 MB files plus INDX and BK11 files)

-- The SDI ingestor supplies the following features which have supported NSC VIE retirement:

-- Bit synched NRZ-S & NRZ-L (differential) signal format data inputs

On board frame synching

-- Distribution box supplies bit synch at FB4 VIE with pass through T-3 TimePlex Digital Multiplexor microwave to NSC. From the NSC microwave connection is then made to the fan-out signal distribution boxes into (multiple) ingestor front ends (including the GINI-2 sdi=s).

In summary, the GOES satellite data ingest subsystem consists of software interfaces between two interconnected hardware platforms. The first component is the SSEC Desktop Ingestor (SDI) satellite image data ingest platform. It is hosted on a DELL PowerEdge 2500 (with a specialized SSEC ingest card) running under the Sun Solaris operating system and using McIDAS McADDE server software. The SSEC computer used the Solaris version of the UNIX sendmail message processing software. The second component is the image retrieval processing software that is resident on the SGI Origin 2000 RISC-based workstation running under the Silicon Graphics IRIX64 operating system and also using McIDAS McADDE client software.

The GOES SSEC Desktop Ingestor (SDI) workstation servers function as a major subsystem. Each SDI server running under the McIDAS operating system environment and various specialized AC" language and FORTRAN language ingest routines, performs the GVAR satellite data ingests, indexes the data into a McIDAS ADDE compatible format, and integrates with UNIX sendmail functions to communicate image data

availability to McADDE clients. The SDI workstation is a standalone component which functions independently of all other subsystems.

The detailed technical description of the SDI hardware and the software processing of ingestor functions and internals will not be included here in this GINI Program Maintenance Manual. Those technical details of the satellite data ingest process can be found in the University of Wisconsin reference publication called AMcIDAS SDI Operator=s Manual". This reference publication can be obtained from the Space Science Engineering Center web site at http://www.ssec.wisc.edu/

5.3.1.2 Ingest Mail Application

The GOES-East mail message processing application on the SGI Origin 2000 is a nohup background UNIX Korn shell script "goes_east.sh= which monitors the "oper1" mail account and processes any incoming email messages received in the oper1 user mailbox. The SDI ingestor is configured to send mail messages to specific accounts on the SGI Origin. At start of each ingest the EAST SDI ingestor sends a start of frame message to single user account "oper1". This start of frame message contains image start time and image satellite coordinate corner boundaries. The "goes_east.sh= program monitors incoming mail with the UNIX "mail -e= command to check for the existence of messages in the mail account. Upon receipt of the message, the UNIX sendmail header is discarded, and the message body is saved to an intermediate file, called a queue file. The same file contents are replicated to a secondary recovery file as a redundant mail message. The image identification and retrieval>C= program "goesE.c (executable goesE.exe)= reads the queue file to launch the appropriate K-shell script that will then download the raw image area files from the SDI ingestor. Once the queue file is read by the "goesE.exe= program, the "goes_east.sh= shell program checks for the availability of the next mail message from the SDI ingestor. If no mail messages are available to read, then the "goes_east.sh= shell program sleeps for number of preset seconds before checking for mail again. Both the "goes_east.sh= and "goes_west.sh= mail programs execute as background UNIX tasks and are independent of all other subsystems.

The goes_east.sh and goes_west.sh ingest mail shell programs are Korn Shell Scripts under ~/mcidas/bin/ have been written and debugged for the following satellite types as indicated by

name. For instance,

goes_east.sh	GOES-EAST
goes_west.sh	GOES-WEST

Thus, each version configuration of the same generic single shell can accommodate the mail message (satellite data ingest event) handling for either GOES-EAST, or GOES-WEST.

The ingest mail shell program do not contain hard coded directory information. The mail shell program will self configure itself upon startup depending on

The Mail shell script runs continuously and independently of other programs, and is also initialized to run as a NOHUP background task. As with the Ingest C-program, the Mail shell window is invoked at program startup, and either/both windows may be closed (exited) without terminating either/both programs. Multiple copies of the individual ingest C-program and/or mail shell ***with the same name*** (i.e., 2 executing goes_west.sh=s, and/or 2 executing goesW.exe=s under the same user account) should **NOT** be running simultaneously. The machine dependent and user account variables, within the goes_east.sh and goes_west.sh scripts, will self-configure the program at runtime to initialize the directory, log files, and event mail notification files, and will then set up the processing for a specific satellite operation.

Mail accounts on the GINI NPORT systems exist under the /var/mail directory. At this time, these assignments of shared mail accounts violate standard UNIX mail access security requirements. In the future, these UNIX security violations will be corrected by a significant redesign of the mail account access configurations. This redesign must be implemented in order to upgrade to future revisions of the UNIX operating system. However, despite the security violations coded into the application software at this time, the GINI NPORT systems should be configured in the following manner:

/var/mail/oper1	(East **primary** user mail account associated with **oper1** <i.e., oper1 processes **GOES-East** data>)
/var/mail/oper2	(West **primary** user mail account associated with **oper2** <i.e., oper2 processes **GOES-West** data>)

No other user mail accounts are required to process East or West data.

Incoming satellite data ingests cause the Imager and Sounder mail message event notifications to be generated from the SSEC Desktop Ingestors (SDI). These are mail notifications are detected by the Mail Shell scripts, the mail message contents are copied to a discreet primary message file, and also replicated to a secondary recovery file (as a redundant file). After the mail message file is interpreted by the mail shell, it is then deleted from the user mail account queue. The user mail account are self maintained; and therefore they do not need to be monitored and pruned by the system administration staff personnel to guard against unnecessary mail message volume retention.

To kill extraneous mail shells, perform a grep in the UNIX shell on Agoes_east.sh" or Agoes_west.sh" with a subsequent kill on the relevant parent/child process id number(s). Then, if needed, restart the program by cd=ing to /usr/oper1(or oper2)/mcidas/src and typing ./goes_east.sh or ./goes_west.sh accordingly. Simple restarts can be performed by invoking the startgoesE(or W).sh (./startgoes_east.sh or ./startgoes_west.sh) since this program can detect already booted processes and will not generate multiple running versions of the same programs. The same can also be accomplished through the main menu system by going down to the Ops submenu and clicking on the AKill SDI MAIL-C Program" option. Restarting both the Mail and C-Programs can then be accomplished by clicking on the AStart SDI MAIL-C Program" option in the same OPS submenu.

Intelligent software coding initializes variables at the top section of the Mail Shell script, so that the application program will configure properly and set up the machine dependencies, associated mail accounts, and satellite processing dependencies, such as:

broadcast pass id flag files;
mail file (read access) recovery flag files;
mail shell log files;
mail queue log files; and
temporary files needed for tracking, debug, or routine processing.

At program startup the shell sets up under standard processing settings (primary mode) as fixed by the hard-coded satellite of choice, and current machine identifier, and user account login identifier settings. However, since GINI-2 requires the

capability to switch the GINI-2 East or GINI-2 West AWIPS feeds to their alternate satellites during prolonged scheduled outages (such as during: satellite maneuvers, satellite eclipse periods, KOZ, satellite failure data outages, etc.), the program loop continuously evaluates the Switch/Reset mode variable contents to access the appropriate satellite event notification mail accounts.

Mail accounts on the GINI NPORT systems exist under the /var/mail directory. Since the oper1 (GOES-EAST) and oper2 (GOES-WEST) mail shells ***MUST OWN*** their respective satellite mail accounts in order to delete processed mail messages while operating in either switched or reset modes, each user account on GINI-2 has its own mail accounts (i.e., 2 mail files each that are owned by oper1 or oper2) under /var/mail. Therefore, oper1 (GOES-EAST processing account) owns both var/mail/east1 as its= primary satellite event mail notification account, as well as /var/mail/west (the oper1alternate satellite switch mode mail account).

At this time, these assignments of shared mail accounts violate standard UNIX mail access security requirements. In the future, a significant redesign of mail account access must be implemented in order to upgrade the system software to future revisions of the UNIX operating system.

The sdi=s are also set up under their respective notify.list and notify.bk11 files to copy all Imager and Sounder mail event messages to the appropriate user accounts (i.e., oper1 - owned by oper1 <East>, oper2 - owned by oper2 <West>.

Mail messages sent by the sdi gvar ingestors have the following format for Imager and Sounder (BK11) events:

gvar.JDccyyddd.N-corner S-corner West-corner E-corner etc

(Sent for Imager at the detection of each pass start only)

Block-11 pass start:
bk11.JDccyyddd.N-corner S-corner West-corner E-corner etc

Block-11 pass end:
bk11.JDccyyddd . End of frame

For GINI-2 which currently has no NWS requirements for

Sounder data processing, the sounder decodes are turned off and commented out in the notify.bk11 file on the sdi. The mail shell also accommodates similar formats for sdi event mail messaging for GMS and MET/INDOEX ingestors which may be readily incorporated as needed into GINI-2 processing when required by NWS future growth. In future, SPSRB prioritization for AWIPS delivery of Sounder remapped images can be delivered to the field by turning on the block 11 ingest at the sdi=s, un-commenting the notify.bk11 file contents, and by modifying the ginirmap and FTP line item entries to include Sounder line item entries for generation and distribution.

The mail shell script is also the natural entry point in GINI-2 processing for manual operator switch over to the alternate spacecraft during routine scheduled outages. The mail shell currently is set up to interpret and process through either operator invoked manual or crontab scheduled switch/restore event mail message event formats. The switch and restore formats follow:

GINI-2.SWITCH.EASTLOOKWEST
GINI-2.SWITCH.WESTLOOKEAST
or
GINI-2.RESET.EASTLOOKEAST
GINI-2.RESET.WESTLOOKWEST

On receipt of either a switch or restore mail message, the mail shell alternates appropriately to the new associated mail account and sets up the McIDAS ADDE DATALOC=s to point to the new sdi ingestor source for subsequent data pulls. The current operative mail shell mode is advertised by this shell script to both the daily logs, as well as the K-shells, and C-Program which continuously evaluates the mail message contents passed to it.

The software code segments in the mail shell script which handles the operator software switching can be readily modified to accommodate fixed format messaging to incorporate future NWS requirements for GINI-2 processing and delivery of text messaging or any number of derived products on an automated or manual basis into the AWIPS feeds as well as on a non-interference basis with the current suites of remap image products. Additional primary mail accounts of note under /var/mail/ are the oper1, oper2, and oper3 mail accounts. These nport system user mail accounts are configured to receive not only satellite event messages, but other file system (error/failure, logoff, or shutdown) mail sent by either the SDI or the SGI Origin 2000's to system user mail

accounts not strictly related to ingests events. By keeping the GINI-2 mail accounts as secondary fixed owner mail files (as opposed to primary system mail accounts), all mail messaging into the mail shell are specific to gvar broadcasts or satellite switch/reset events only. By keeping secondary fixed owner mail files rather than primary user system mail accounts as inputs to the mail shell script, the additional benefit that multiple satellite ingests can still be simultaneously run if needed under the same user (i.e., oper1, oper2, or oper3) account id.

The mail shell script is coded to detect and process a single mail message at a time, subsequently deleting already processed messages from the active mail account associated with the satellite data being processed. The program continues to search the primary or secondary active mail account for new mail entries in sequence until notified to alternate (switch or reset) to a new satellite mail account. No shutdown or restart of the this program is required from a design standpoint. These programs are designed to run indefinitely. All mail event message information is passed by this shell script to the satellite ingest C-Program for mail message interpretation and evaluation.

5.3.1.3 Satellite Ingestor C-Program

The satellite ingest C-Program is independent intermediary code designed to bridge together the mail program outputs with the appropriate sets of ADDE sector pulls that fill the area file ranges. At its most basic, the C-Program evaluates the start of image corner boundaries forwarded by the event mail shell from the sdi=s to determine the type of broadcast pass being entered. Having determined the broadcast pass identity, the ingest C-Program subsequently launches the image copy pass related ADDE pulls contained in the various Korn shell image copy scripts that reside in both the oper1and the oper2 data sub-directories (~/mcidas/data).

The ingest C-Program is currently the most complicated single software unit within the GINI-2 system. This software is written in a non-structured coding style format with a significant number of Agoto" programming statements. At this time, it is difficult to read and interpret easily. It handles most of the ingest specific processing requirements. The software coding for later process handling, such as for the AWIPS sector/product remap process, the McIDAS-to-AWIPS file reformat process, and the FTP dissemination processes have already been largely rewritten in a structured

programming style, and when compared against the ingest processing are straightforward, as they now incorporate simple procedures and modular programming.

Standard Operations satellite ingest code was developed and debugged on a case-by-case basis for each satellite type. This AOPS" code was then modified for AWIPS specific ingest requirements, which increased the code volume by 10 times the number of lines of code in Standard Operations versions. Much of this code is in-line and repeated continuously, and the repeated code can be reduced to called procedures and functions. This desired enhancement will be implemented in the future. By contrast, the straightforward procedures and modular construction of the remappers, AWIPS reformatter, and FTP dissemination code already promotes a modular maintainable structure, which will facilitate rapid implementation of new AWIPS sector/product requirements in a Aplug and play" manner whenever new satellite data sources "nd/or derived satellite products are integrated with the existing AWIPS sector/product suites.

As of bringing GINI-2 on-line in September 1999, the single ingest C-Program handles several different satellite suites: GVAR satellites (GOES-8 through GOES-12), GMS-5, and MET-7/INDOEX (/Met-5). All but the GMS ingestors (no available broadcast scenarios from Japan) were debug validated for Year 2000 operation based on several series of GVAR and MET broadcast tests beginning in August 1997 and continuing through October 1999.

The "goesE.c (executable goesE.exe)= image retrieval program determines what type of stretched GVAR area quadrant is being ingested and begins multiple McADDE "IMGCOPY= commands to retrieve desired stretched GVAR data stream segments. After each stretched GVAR data segment the program executes a new subordinate task. Each GOES-East AWIPS sector type (for instance: CONUS, NHEMI, PRREG, PRNAT) contains a corresponding Korn shell file in the A~/mcidas/data" directory. These Korn shells are called by the "goesE.exe= program if a particular sector is matched. For example, if the "goesE.exe= program determines that a new Northern Hemisphere quadrant is being ingested the task will spawn off the Korn shell "gini_E_NH.sh= which contains appropriate "IMGCOPY= commands. Because the corner points for Puerto Rico regional and Puerto Rico national remapped sectors are contained within the boundaries of the stretched Northern Hemisphere quadrant the Puerto Rico Regional Korn shell "gini_E_PRREGL.sh=, and the Puerto Rico National Korn

shell “gini_E_PRNATL.sh= are also executed. Each of these shells is configured to execute various McADDE “IMGCOPY= commands corresponding to the type of ingested quadrant sector being retrieved. The “goesE.exe= program executes as background UNIX tasks and is independent of all other subsystems.

The basic flow of sequential ingest processes are as follows:

- mail interaction & recover file evaluation
- BC pass ID algorithm for East/West/Central or MET(/Indoex) or GMS
- switch/reset evaluation
- sector biasing for switch/reset conditions
- Legacy PACUS & HAW-RSO detection
- Generic BC pass ID file evaluation & generation
- Launch of ADDE pull shell sets

The ingest C program must differentiate specifically for GINI-2 systems whether or not an incoming mail message will be related to the frame start/end information for imagery, or if either an automated or manual satellite data source switch/reset is indicated. So the first task which must be performed is to differentiate between the two types of messages (frame information or switching). Switch/reset messages will require the originally preset East or West satellite ID to convert to (or be restored from) it=s designated alternate (i.e., if the original satellite ID for the oper1=EAST AWIPS account is set for GOES-East (as it should be); a switch message will mandate that the operative satellite source for this account now accesses GOES-West data, while a reset message will bring (what was) GOES-West inputs for oper1 back to GOES-East data processing. All the while, the EAST AWIPS product suite being generated is the same set of Lambert CONUS=s, Puerto Rico Regional Mercator=s and PR National PS=s, and North Hemi & SuperNational PS sectors despite any changes in data sources).

In the mail message procssing C-program, much more than satellite ID variable contents change with receipt of a switch or reset message. The C program changes the IP address of the source sdi through the invocation of a McIDAS DATALOC command. The ingestor C program then loads up the primary(/restore) or alternate(/switch) satellite configuration (reference) files and evaluation breakpoints which are needed for the program logic to determine the type of broadcast pass in progress. Sector biasing of corner bounds for AWIPS specific product suites must be translated from (/switched) or restored to (/reset) the native sub-satellite point since data points in the native GOES projection originating at

a given line/pixel number at 75 W do not correspond to the same data points at the same line/pixel number at 135 W. This becomes particularly important for AWIPS East and West Regional and National product sector line/pixel corner boundaries and (product “make/no-make”) evaluation criteria references under switched/restored data input conditions.

The Program must then determine with respect to the given broadcast pass in progress, which standard Imager sector identification is appropriate for the frame: East or West Full Disk, East or West North Hemisphere, East or West CONUS/PACUS/Legacy-PACUS (seen under West RSO), East or West Southern Hemisphere South, Southern Hemisphere Small (seen only on the West), Hawaii RSO (seen under special request West RSO), or East or West SRSO. Once done, the program must then determine whether the minimum coverage required by NWS to generate each of the East (or West) product suites can and should be done given the translated or “biased” product inputs. Once these requirements are fulfilled, the program writes a single line broadcast pass identification information to a flag file (used by the ginirmap program to determine the proper LUT needed to generate the remaps) and launches the appropriate ADDE pull script sets.

5.3.1.4 Mail Message Ingestor Korn Shell Scripts

[Updated January 2003 - Patrick Otero]

5.3.2 Image Remap Process

A special UNIX Korn shell task on the SGI Origin “goes_east.sh= monitors the email account, processes all incoming email messages, and passes the image corner points to a “C= language program: “goesE.c= (executable goesE.exe). The “goesE.exe= program determines what type of stretched GVAR quadrant is being ingested and executes multiple McADDE “IMGCOPY= commands to retrieve desired stretched McIDAS segments and place them into production area file ranges. Both the “goes_east.sh= and “goesE.exe= programs execute as background UNIX tasks and are independent of all other subsystems.

The remap processing major subsystem consists of one McIDAS “C= program “ginirmap.c (executable ginirmap.k)= which constantly monitors all incoming stretched McIDAS areas, creates McIDAS-based remapped areas, converts McIDAS-based remapped areas to GINI AWIPS format, and copies the GINI AWIPS formatted products to the EAST FTP transfer directory “/data1/eastftpxfer/= or WEST FTP transfer directory “/data2/westftpxfer/= for later distribution by an independent FTP transfer subsystem.

The “ginirmap.c= program utilizes several McIDAS McADDE commands (IMGDEL,IMGREMAP,IMGCOPY,IMGOPER,IMGCHA,IMGFILT) to remap incoming stretched GVAR areas to the equivalent AWIPS format and calls four external Korn shell scripts “buildheader.sh=, “buildchunk.sh=, “buildtrailer.sh=, and “buildproduct.sh= to build the AWIPS output including the AWIPS header section, the AWIPS data portion, and the AWIPS trailer section. The built output conforms to the AWIPS file format as documented in the AWIPS Program Office publication, Interface Control Document (ICD) for AWIPS, date August 1, 1999.

The “buildheader.sh=, “buildchunk.sh=, and “buildtrailer.sh= scripts are only called when an EAST CONUS or WEST CONUS sector is being processed while the “buildproduct.sh= script is called to process all other sector types. The “buildheader.sh= Korn shell script creates the AWIPS header for the EAST CONUS or WEST CONUS product by calling the AWIPS product reformatter program “mc2awips= with appropriate parameters. As the EAST CONUS stretched McIDAS data arrives chunks of the remapped data are packaged and sent to the FTP transfer directory by the “buildchunk.sh= script. After all the data chunks have been sent the “ginirmap.c= program calls the “buildtrailer.sh= program to tack on the one line length alternating 0 and 255 pattern AWIPS trailer as specified in the AWIPS ICD.

The “buildproduct.sh= script is called by the “ginirmap.c= program to process all non-CONUS sectors. The “buildproduct.sh= script builds the AWIPS header via the “mc2awips= reformatter program, then builds the entire data portion by calling the “buildchhunk.sh= script with maximal line and element values, then builds the trailer portion by calling the “buildtrailer.sh= script. After all these various components are created in temporary files the “buildproduct.sh= script concatenates the header, data, and trailer portions into one file and copies the resulting file to the EAST FTP transfer directory “/data1/eastftpxfer/= or to the WEST FTP transfer directory “/data2/westftpxfer/= for later distribution by an independent FTP transfer subsystem.

5.3.3 AWIPS Product Reformatter Process

The GOES-East remap processing major subsystem consists of the following: one McIDAS “C” language program (source “ginirmap.c= and executable “ginirmap.k=) that constantly monitors all incoming stretched GVAR data files, creates McIDAS-based remapped area files, converts McIDAS-based remapped area files into the required AWIPS compatible format, and transfers the AWIPS formatted sector/products into the directory “/data1/eastftpxfer/=. The remap processing subsystem executes in the foreground as a UNIX Korn shell task inside a xterm window.

The AWIPS product reformatter program “mc2awips.c (executable mc2awips)= takes as input a McIDAS area and converts the area into a valid AWIPS-compatible sector. The program consists of a main program “mc2awips.c= and

several configuration files, one for each AWIPS sector type. Below is a list of sectors names and the corresponding mc2awips configuration file.

GOES-East sector name	Configuration File Name
East CONUS sector	EConus.cfg
Puerto Rico Regional sector	PRReg.cfg
Puerto Rico National sector	PRNat.cfg
Super National composite	SuperN.cfg
Northern Hemisphere composite	NHemi.cfg

GOES-West sector name	Configuration File Name
West CONUS sector	WConus.cfg
Alaska Regional sector	AKreg.cfg
Hawaii Regional sector	HAWreg.cfg
Alaska National sector	AKnatl.cfg
Hawaii National sector	HAWnatl.cfg
Super National composite	SuperN.cfg
Northern Hemisphere composite	NHemi.cfg

For the GOES-East GINI-2 system the GOES-East config files should be placed into directory “/data1/easttemp=. For the GOES-West GINI-2 system the GOES-West config files should be placed into directory “/data2/westtemp=. Each config file contains templates to process all 5 satellite bands including VIS (visible), I39 (3.9micron), I11 (11micron), I12 (12 micron), and WV (wator vapor). The type of sector being processed is passed to the main program as well as the intended McIDAS area file to use as input. The syntax for calling the program is

mc2awips option McIDASfilename

where option = 0 (Northern Hemisphere composite)
= 1 (East CONUS)
= 2 (West CONUS)
= 3 (Alaska Regional)
= 4 (Alaska National)
= 5 (Hawaii Regional)
= 6 (Hawaii National)
= 7 (Puerto Rico Regional)
= 8 (Puerto Rico National)
= 9 (Super National composite)

and McIDASfilename is the full path to the McIDAS input area file to be converted. The main remap processing program “ginirmap.c= calls the program “buildheader.sh= when processing East CONUS or West CONUS sectors and calls the program “buildproduct.sh= when processing all other sectors. Both the “buildheader.sh= and “buildproduct.sh= Korn shell scripts make calls to mc2awips with the appropriate parameters. If the mc2awips program performs

the conversion correctly the resulting header file for an EAST sector is placed into directory "/data1/easttemp/= and a WEST sector is placed into directory "/data2/westtemp/=. The resulting filename will be the concatenation of the configuration file prefix plus the appropriate band suffix (.VIS, .I39, .I11, .I12, or .WV). For example, to convert a GOES-East McIDAS Super National band I12 file the following mc2awips command would be executed:

mc2awips 9 /data1/eastraw/AREA3451

The resulting header file will be located in directory "/data1/easttemp= and be named SuperN.I12.

To convert a GOES-West McIDAS Alaska Regional water vapor (WV) band area file the following mc2awips command would be executed:

mc2awips 3 /data2/westraw/AREA3301

The resulting header file will be located in directory "/data2/westtemp= and be named AKreg.WV.

In the case of the EAST (or WEST) CONUS sector the header is generated by the "buildheader.sh= script. After the header is generated the "buildchunk.sh= script is called multiple times to build chunks (sequential portions) of the CONUS remap. When the CONUS sector data is completely processed the "buildtrailer.sh= script is called to send the necessary AWIPS format trailer. For all other sectors the complete product is built by the "buildproduct.sh= script before being sent to the FTP transfer directory.

5.3.4 FTP Product Dissemination Process

The GINI-2 product dissemination software functions as a major subsystem task. This software consists of two Korn Shell script programs. The "ftpproduct_east.sh= script is used for the dissemination of East sector/products and operates under the "oper1" user account. The "ftpproduct_west.sh= is used for the dissemination of West sector/products and operates under the "oper2" user account. These scripts use the File Transfer Protocol (FTP) program to transfer completed AWIPS ready products to the AWIPS Network Control Facility (ANCF) located in Silver Spring, Maryland. If the operational status of the FTP dissemination script is shown as ACTIVE/ENABLED, then that NPORT systems= dissemination process is considered to be the "on-line" system, and that system begins dissemination of its processed imagery products to the ANCF. Each of the East and West AWIPS image product streams are independently transmitted by their individual respective "on-line" dissemination scripts over the two dedicated T-1 circuits that interconnect the GINI/NPORT systems directly to the ANCF facility.

Completed AWIPS sector/products are continuously stored into designated

transfer directories on the GINI/NPORT system. The FTP dissemination script continually monitors these transfer directories for the presence of any sector/product, and then initiates a FTP session whenever any sector/product is detected.

The GINI/NPORT system dissemination major subsystem task consists of two Korn Shell script programs. There are three possible destination Network Control Facilities that can receive AWIPS sector/products from the GINI dissemination subsystem task. Included within the “ftpproduct_east.sh= script and “ftpproduct_west.sh= is the dissemination capability to configure for any one of these three NCF facilities. When the script is first executed, it reads a static configuration file. Contained within this configuration file is the name of the destination NCF that the dissemination script will configure itself for. The software programming logic to handle this self configuration is completely self contained within the script, and no external loading nor deleting of additional software is required. At this time, the three possible NCF facilities that the software can configure for are: (1) the AWIPS-NCF located in Silver Spring, Maryland, and (2) the TEST-NCF located in McLean, Virginia, and (3) the BACKUP-NCF located in Fairmount, West Virginia. These scripts use the File Transfer Protocol (FTP) program to transfer completed AWIPS ready products to the destination Network Control Facility (NCF). If the operational status of the FTP dissemination script is ACTIVE/ENABLED, then that NPORT systems= dissemination process is considered to be “on-line” to that NCF, and the NPORT system begins dissemination of its sector/product imagery to that NCF. Each of the East and West AWIPS image product streams are independently transmitted by their individual respective “on-line” dissemination scripts over the various dedicated T-1 circuits that interconnect the GINI/NPORT systems directly to any of the three NCF facilities. Reference the “ppendix C for the operator level procedure that is executed to configure GINI application software for the destination NCF.

When AWIPS sector/products become ready for dissemination, they are placed into designated transfer directories on the GINI/NPORT system. The FTP script continually monitors these specific transfer directories for the presence of any sector/product. If a sector/product is detected and if the status the script is ACTIVE/ENABLED, then a new FTP session is immediately started. A single FTP transfer session to the ANCF begins and completes for each sector/product found in a transfer directory. After each FTP session is complete, various FTP error flags are checked to verify receipt of the sector/product at the ANCF, and in occurrences of detectable transfer errors, the shell script is responsible for handling a predefined set of possible dissemination anomalies. In addition, the script continually issues monitoring log messages which catalog the progress and status of product disseminations. These logs can be reviewed as needed by both operators and system administration personnel to troubleshoot GINI/NPORT to AWIPS communication problems.

The FTP dissemination task disseminates all AWIPS sector/products in a special, predefined priority order. This priority scheme is dictated by National Weather Service requirements, which have been optimized to disseminate the

most important sector/products to the AWIPS field sites with minimal delay. The highest level of the dissemination priority scheme is assigned initially to the dissemination of the CONUS Lambert VISIBLE sector/product. The next lower priority dissemination level is assigned to all the other AWIPS image sector/products. These are disseminated in order from oldest to newest, determined by UNIX file creation time, until the transfer directory is empty. After all image sector/products are disseminated, the shell script checks for possible external products. (See appendix 6.B. for reference documentation of external products.) External products are defined as any type of weather product generated outside the GINI-2 system, yet will be disseminated using the internal FTP communication services of the NPORT system to the AWIPS-NCF (ANCF). Interfacing through an attached secure firewall on each NPORT system, the GINI-2 system acquires external products from a designated file server located within the SATEPS facility. The lowest level dissemination priority is assigned to these external products so that the more important AWIPS image sector/products are always disseminated before external products. Only when there are no AWIPS image sector/products present in a transfer directory, can the external products be acquired and disseminated. This priority scheme ensures that AWIPS imagery will always be allocated first use of the NPORT system=s dissemination resources over less important external products, and thus external products will never interfere with the timely dissemination of AWIPS imagery.

After a sector/product is successfully disseminated to the ANCF, it is then saved into a designated archive directory and retained for a 24 hour period. The FTP dissemination product script also handles the removal of old data from the archive directories. As the latest sector/product is disseminated and then saved into the archive directory, the script automatically removes the same product that has now become older than 24 hours. This continuous save/remove archive process is event driven by the incoming data, and ensures that the archive directories never hold data older than 24 hours. Thus, the archive directories are always self maintained at a constant capacity, and will not over-flow the UNIX file system.

5.3.5 Monitoring

The dissemination script verifies receipt of the sector/product at the ANCF, and is responsible for handling a predefined set of possible dissemination anomalies. In addition, the script continually issues monitoring log messages which catalog the progress and status of product disseminations. These logs can be reviewed as needed by both operators and system administration personnel to troubleshoot GINI/NPORT to AWIPS communication problems.

5.4 Applicaton Menu Process

The custom TCL/TK menu minor subsystem is a Tool Control Language/Toolkit (TCL/TK) program which enables the user to click the mouse on a variety of

options/commands displayed in a scrollable window. The TCL/TK language is a popular UNIX-based interpreted language which allows the developer to build a simple graphical user interfaces (GUI) tied to various actions in an X-Windows environment. The menu subsystem was previously built for another application and adapted for this project. The menu subsystem consists primarily of a main program ".menu__program= and a configuration text file ".menu__config=.

The menu system main program reads the menu system configuration file and displays the configured options to the user. The developer can easily modify, add, or delete options from the configuration file. Menu options can be tied to a variety of actions including single McIDAS commands, McIDAS BATCH files, multiple McIDAS commands, UNIX Korn Shell scripts, and UNIX system commands. Output can be directed to the McIDAS command window or to a popup window. Menu system options include several operational scripts to switch satellite processing modes (normal or eclipse), to switch FTP operations between SGI Origin systems, to display latest GINI formatted images sent to the NCF, to debug McIDAS and GINI-formatted files, to view directory listings of McIDAS area files, to view eight types of logs (7 days of logs are always available), and to perform various system quality control tasks such as CPU monitoring, system process monitoring, disk usage monitoring, and network monitoring.

Refer to Appendix 6.C.5 for sample ".menu__program= and ".menu__config= files. To explain how the menu system is configured I will extract code fragments from ".menu__config= and then provide appropriate comments. Below is a configuration fragment from ".menu__config= with pre-pended line numbers:

```
1       #
2       # DEFINE TOP LEVEL MENU DEFINITION FILES
3       #
4       F001/usr/people/oper1/mcidas/data/.menu__config
5       #
6       # MENU 1 - TOPLEVEL MENU (USING MENUDEF FILE "F001')
7       #
8       M1
9       O" MINIMIZE/ICONIFY          A {doit {          proccmd-iconifyWindow
.menu}}
10      O"                           A {}
11      L" OPERATIONAL MENU                 A
12      O"* GINI EAST OPS MENU       A {doit {proccmd-showMenu F001 10}}
13      L" GINI REMAP MENUS                 A
14      O"* DISPLAY Remaps           A {doit {proccmd-showMenu F001 2}}
15      O"* DUMP GINI Headers                A {doit {proccmd-showMenu F001
3}}
16      O"* DUMP McIDAS Headers      A {doit {proccmd-showMenu F001 4}}
```

Notes:

Lines beginning with a "#= characters (1,2,3,5,6,7) are comments to help document the menu configuration parameters.

Line 4 binds the menu file configuration location "/usr/people/oper1/mcidas/data/.menu__config= to the shorthand variable "F001' . Other configuration files can be created and can be designated as "F002', "F003', etc., for further use in the menu configuration file.

Each menu consists of 3 components, a menu number, menu lables, and menu options.

Menu numbers are designated by the "M= character in column 1 immediately followed by an integer. Line 8 defines menu number 1 which will comprise all lines up to the next "M= menu number.

Menu labels, designated by the "L= character in column 1, define a label header to the user in bold text. Menu labels such as lines 11 and 13 are a way to organize menu options into separate subsections. Labels are not bound to any actions when the menu is displayed.

Menu options, designated by the "O= character in column 1, define the text to be displayed to the user and the binding action which takes place upon a mouse click on the option. Line 10 binds a NULL option to a blank line thus line 10 is an example of how to configure blank space between other menu options. Line 9 presents the text "MINIMIZE/ICONIFY= to the user and binds the program procedure iconifyWindow when the option is clicked on. Lines 12,14,15, and 16 are examples of how a new menu number (submenu) can be loaded. In Line 12 the program procedure showMenu accepts 2 parameters, the location of the new menu configuration file and the menu number within this configuration file to load into the window. Note that the "F001' variable was previously set to the location of the top level menu configuration file. Although the GINI menu system options are currently in one file, designation of multiple menu files is possible. Other option actions from ".menu__config= are shown below with pre-pended line numbers:

The following line shows how to tie a McIDAS text command action to an option. The action designation "mctxtcmd-= directs the menu program to execute various McIDAS IMGDISP commands specified and output the results to the current McIDAS command window xterm. Note that if multiple McIDAS commands are specified they must be separated by a semicolon with spaces before and after the semicolon.

302 O" * WEST Wconus.VIS A {doit {mctxtcmd-IMGDISP LOC/POS.7001 MAG=-12 ; EG ; MAP }}

The following line shows how to tie a McIDAS listbox background command action to an option. The action designation "mclbcmd-= directs the menu program to execute various McIDAS IMGLIST commands specified and output the results both to the current McIDAS command window xterm and to a popup listbox window.. Note that if multiple McIDAS commands are specified they must be separated by a semicolon with spaces before and after the semicolon.

36 O" * LIST CONUS AREAS" {doit {mclbcmd-IMGLIST GINI/ECONUS01V.ALL ; IMGLIST GINI/ECONUS04I2.ALL ; IMGLIST GINI/ECONUS04I3.ALL ; IMGLIST GINI/ECONUS04I4.ALL ; IMGLIST GINI/ECONUS04I5.ALL }}

The following line shows how to tie a UNIX background shell command to an option. The action designation “exbgcmd-> directs the menu program to execute in the background an xterm command. The xterm command is configured with the following options,
>-title=: the window title of the xterm is “KSH=
>-geometry 120x60+50+10': the geometry of the window is 120 characters width by 60 lines located 50 pixels right and 10 pixels down from the upper left hand corner of the screen
>-fn screen18': utilize the X Windows font named screen18
>-sb=: enable a scrollbar for the xterm
>-sl 1024': configure the xterm to save the last 1024 lines flowing through the xterm
>-e /usr/people/oper1/mcidas/data/.menu__script-exech.sh=: upon loading of the xterm execute the UNIX script file “/usr/people/oper1/mcidas/data/.menu__script-exech.sh=

54 O” * New Ksh (Large Font)” {doit {exbgcmd-xterm -title KSH -geometry 120x60+50+10 -fn screen18 -sb -sl 1024 -e /usr/people/oper1/mcidas/data/.menu__script-exech.sh

The following line shows how to tie a UNIX background shell command to an option and list the results to the user in a popup listbox window. The action designation “exlbbgcmd-> directs the menu program to execute in the background an ls command and to display the results to the user in a popup listbox.

18 O” * /data1/eastflags A {doit {exlbbgcmd-ls -l /data1/eastflags }}

Options and labels can be easily added to the “.menu__config= file via an editor such as “vi=. To add options simply create a line beginning with “O= followed by the text to display followed by the desired option type followed by the actual command(s) to be executed. To delete an option simply delete the option line from the “.menu__config= file. New menus can be created by tacking a new menu number to the end of the config file followed by the desired options and lables. One thing to be careful about is not to duplicate menu numbers in the file. If duplicate menu numbers are specified the first menu number found will be the one loaded.

6 Program Documentation

6.1 Data Description

6.1.1 GVAR Satellite Data Input

[Updated January 2003 - Patrick Otero]

The GOES satellite data ingest subsystem consists of software interfaces between two interconnected hardware platforms. The first software component is the SSEC Desktop Ingestor (SDI) satellite image data ingest platform. It is hosted on a DELL PowerEdge 2500 (with a specialized SSEC ingest card) running under the Sun Solaris operating system and using McIDAS McADDE server software. The second software component is the image retrieval process that resides on the SGI Origin 2000 workstation running under the Silicon Graphics IRIX64 operating system and also using McIDAS McADDE client software.

The GOES SSEC Desktop Ingestor (SDI) workstation servers function as a major subsystem. Each SDI server running under the McIDAS operating system environment and various specialized “C” language and FORTRAN language ingest routines, performs the stretched GVAR satellite data ingests, indexes the data into a McIDAS ADDE compatible format, and integrates with UNIX sendmail functions to communicate image data availability to McADDE clients. The SDI workstation is a standalone component which functions independently of all other subsystems.

The detailed technical description of the SDI hardware and the software processing of SDI ingestor functions and SDI internals will not be included here in this GINI Program Maintenance Manual. Those technical details of the satellite data ingest process can be found in the University of Wisconsin reference publication called “McIDAS SDI Operator=s Manual”. This reference publication can be obtained from the Space Science Engineering Center web site at http://www.ssec.wisc.edu/

During routine scan operations, the GOES-EAST and GOES-WEST satellites generate a satellite broadcast imagery quadrant averaging one broadcast every 15 minutes from all five sensors, with a full disk quadrant being generated every 3 hours from all five sensors. There will be approximately 960 unique broadcast image quadrants from all five different satellite sensors during one 24-hour period from the two GOES satellites. Therefore, the total volume of stretched GVAR data quadrants that are broadcast from the two GOES satellites is about 100,000 Megabytes in 24 hours. In addition to the routine scan operations described above, each of the GOES satellites can also be placed into Rapid Scan Operations (RSO) and/or Special Rapid Scan Operations (SRSO) independently and/or concurrently, thereby generating data broadcasts of additional satellite imagery when needed to monitor and track significant weather and other meteorological events.

SDI GVAR satellite data files:

Name	Size	Contents
gvar.yyyy.ddd.hhmmss.INDX	0.5 MB	GVAR Image Index file
gvar.yyyy.ddd.hhmmss	1.0 MB	Stretched Data Format file

6.1.2 Intermediate McIDAS data files -Remapped Data

[Updated January 2003 - Patrick Otero]

After the GVAR satellite data is copied to the NPORT systems from the SDI Stretched Data Format (SDF) input files, they are remapped into McIDAS area files and stored as intermediate files under the appropriate operational user account, for either “oper1" or “oper2", under that user account=s temporary “~/data/remap” data sub-directory. The file name begins with the four letter code AAREA” and ends with a predetermined four character number code. The four character number codes can range from “0000" to “9999". The intermediate area files are not archived, nor are they retained for retrospective observation. Each intermediate remapped area file is destroyed, removed, and written over as needed by the next image remap on the next incoming satellite data period. Temporary McIDAS data files are not saved in any way, and the disk space is simply reused by the next image remap.

In each GOES-EAST data period, there are a maximum of 23 remapped image files generated of AWIPS sector/products for EAST operational production. In each GOES-WEST data period, there are a maximum of 31remapped image files generated of AWIPS sector/products for WEST operational production. Intermediate McIDAS remapped area files are NOT retained nor needed for retrospective troubleshooting. Therefore, the total file size requirement of all the intermediate data files retained by system resources is exactly zero megabytes.

GINI intermediate McIDAS data [Updated January 2003 - Patrick Otero]

Temporary Area File Name	Saved Size	Description of Contents
AREA0100 to AREA0101	0 MB	Temp work area files for CONUS remaps
AREA0107 to AREA0120	0 MB	Temp work area files for Composite remaps
AREA4000 to AREA4600	0 MB	Temp work area files for Puerto Rico remaps
AREA5000 to AREA5600	0 MB	Temp work area files for Alaska remaps
AREA6000 to AREA6600	0 MB	Temp work area files for Hawaii remaps
AREA7000 to AREA7700	0 MB	Temp work area files for Nhemi remaps

AREA9000 to AREA9700	0 MB	Temp work area files for SuperN remaps

6.1.3 Output AWIPS Files

[Updated January 2003 - Patrick Otero]

The AWIPS product file reformat program "mc2awips.c" (executable mc2awips.exe) takes as input a remapped McIDAS area file and converts the area into a valid AWIPS-compatible sector. The program consists of a standalone program, called "mc2awips.exe", and works with several configuration files, one for each AWIPS sector type. Below is a list of sectors names and the corresponding mc2awips configuration file that is used for that sector type.

GOES-East sector type	Configuration File Name
East CONUS sector	EConus.cfg
Puerto Rico Regional sector	PRReg.cfg
Puerto Rico National sector	PRNat.cfg
Super National composite	SuperN.cfg
Northern Hemisphere composite	NHemi.cfg

GOES-West sector type	Configuration File Name
West CONUS sector	WConus.cfg
Alaska Regional sector	AKreg.cfg
Hawaii Regional sector	HAWreg.cfg
Alaska National sector	AKnatl.cfg
Hawaii National sector	HAWnatl.cfg
Super National composite	SuperN.cfg
Northern Hemisphere composite	NHemi.cfg

For the GOES-East GINI system, the GOES-East config files should be placed into directory "/data1/easttemp=. For the GOES-West GINI system, the GOES-West config files should be placed into the directory "/data2/westtemp=. For the GVAR satellite types of GOES-8 through GOES-11, each config file contains templates to process the five 5 satellite bands including VISIBLE (visible), I39 (3.9micron), I11 (11micron), I12 (12 micron), and WV (wator vapor). In addition, the config file has been updated to The type of sector being processed determines the final format of the AWIPS header applied to the final product.

The AWIPS sector/product files consist of remapped imagery from the GOES satellite that are derived from the five available bands on the GOES satellites. In general, each remapped AWIPS sector/product file is generated five different times, one product for each sensor; thereby showing imagery coverage of the same identical areal data in all five bands and in different resolutions.

6.1.4 McIDAS AREA directory blocks

The first 64 words of the area file contains the directory block for each image. The data in the directory is stored as a 32-bit (4 byte) two=s- complement binary integers. Each of the directory=s 64 words is described below. Since some of the words are satellite specific, see the McIDAS Programmer Manual for these words.

Word	Value	Description
1		Relative position of the image object in the ADDE dataset
2	4	image type(currently=4)
3	99	SSEC sensor source number
4	system date	nominal year and Julian day of the file, yyyyddd
5	system time	nominal time of the file in hhmmss
6	1	upper-left image line coordinate
7	1	upper-left image element coordinate
8		Reserved
9	960	number of lines in the image
10	2160	number of data points per line
11	1	number of bytes per data point
12	1	line resolution
13	1	element resolution
14	1	number of spectral bands
15	0	length of line prefix
16		SSEC file creation projection number
17		file creation year and Julian day, yyyyddd
18		file creation time, hhmmss
19	1	spectral band map
20		image ID number

21-24		reserved for sensor-specific data
25-32		memo field; 32 ASCII characters
33	501-599	Reserved
34	768	byte offset to the start of data block
35	256	byte offset to the start of data block
36		validity code
37-44		PDL(program data load); used for pre-GOES-8 satellites
45		source of band 8; used for GOES AA processing
46		actual image start year and Julian dat yyyyddd.
47		actual image start time hhmmss
48	1	actual image start scan
49		length of the prefix documentation
50		length of the prefix calibration
51		length of the prefix band list
52	TMI	source type; satellite specific(ASCII)
53	BRIT, RR, CLW	calibration type; satellite specific(ASCII)
54-59		Reserved
60		byte offset to supplemental block
61		number of bytes in the supplemental block
62		Reserved
63		byte offset to the start of the calibration block
64		number of comment cards

6.1.5 AWIPS header B Product Definition Block (PDB).

[Updated January 2003 - Patrick Otero]

The Product Definition Block (PDB), fully enveloped within the AWIPS header, contains the primary description information of the video product inside of the

AWIPS image file. Each data field within the PDB header is called an "octet" (for 8-bit byte). The content descriptions for each PDB header octet are clearly described below. This information was copied directly from the AWIPS reference manual: "Interface Control Document (ICD) for AWIPS - National Environmental Satellite, Data, and Information Service (NESDIS)". The AWIPS document number is # AA0130008 CH-2, August 1, 1999.

Octet	Scaling , Length	Contents Description
1	Integer, 1-byte	Source organization
2	Integer, 1-byte	Creating entity
3	Integer, 1-byte	Sector-ID
4	Integer, 1-byte	Physical Element / Channel-ID
5-6	Integer, 2-bytes	Number of Logical Records in Product
7-8	Integer, 2-bytes	Size of Logical Record in bytes for Product
9	Integer, 1-byte	Year of Century
10	Integer, 1-byte	Month of Year
11	Integer, 1-byte	Day of Month
12	Integer, 1-byte	Hour of Day
13	Integer, 1-byte	Minute of Hour
14	Integer, 1-byte	Second of Minute
15	Integer, 1-byte	Hundredths of Second
16	Integer, 1-byte	Map Projection Indicator
17-18	Integer, 2-bytes	Number of points along x-axis
19-20	Integer, 2-bytes	Number of points along y-axis
21-23	Integer, 3-bytes	Latitude of first grid point
24-26	Integer, 3-bytes	Longitude of first grid point

27	blank	Reserved
28-30	Integer, 3-byte	Longitude orientation of the grid
31-33	Integer, 3-byte	X-direction of the increment
34-36	Integer, 3-byte	Y-direction of the increment
37	Bit flags	Projection center flag
38	Bit flags	Scanning mode
39-41	Integer, 3-byte	Latitude of Lambert projection cone tangent to the earth
42	Integer, 1-byte	Image Resolution
43	Integer, 1-byte	Data Compression Indicator
44	Integer, 1-byte	Version Number for PDB
45-46	Integer, 2-bytes	Number of bytes in PDB
47	Integer, 1-byte	Navigational Calibration Indicator
48-512	blanks	Reserved for Navigation and Calibration

6.2 Source Code

These tables need to be updated as per front half of document ...make sure there are no missing references down here

A brief description of all SGI Origin 2000 major programs, scripts, and configuration files is shown below. The listing is divided into code categories -- “C programs=, “.profile and Korn Shell boot-related programs=, “Korn Shell applications=, “McIDAS MACRO programs=, “TCL/TK menu programs=, “McIDAS configuration files=,>Source compilation files=-- and then the program names are sorted alphabetically in each category.

6.2.1 Source Programs in C

Summary Descriptions of “C= language programs:

File Name	Description
areadate.c	**Function:** Dump the file date/time of a McIDAS area file. **Inputs:** **Outputs:** **Run string:**
datetime.c	**Function:** Dump true date/time of the image inside a McIDAS area file. **Inputs:** **Outputs:** **Run string:**
calibrate.c	**Function:** Program performs a lookup table calibration on an existing McIDAS area file. The program is not utilized currently but may be needed in the future if the data transmitted to the NCF needs to conform to a specific enhancement curve. **Inputs:** **Outputs:** **Run string:**
dumpaa.c	**Function:** Dump directory contents of McIDAS area file. **Inputs:** **Outputs:** **Run string:**
dumpgini.c	**Function:** Dump header contents of an AWIPS-format file. **Inputs:** **Outputs:** **Run string:**
ftpchunk.c	**Function:** Extract chunk (portion) of the data from a McIDAS area file and save in a temporary file. **Inputs:** **Outputs:** **Run string:**

ftptime.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Wrapper around "FTP= command to prevent hung FTP processes from locking system.
ftptrailer.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Create one line of alternating 0 and 255 element values and save in a temporary file.
goesE.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Main East AWIPS ingest program which analyzes East mail message contents, controls satellite source program switching and resets, identifies the broadcast pass; and launches the appropriate sequences of ADDE image pull shells accordingly to fill up appropriate target area file ranges for each broadcast pass. The program also creates an independent broadcast pass identifier text flag file which the ginirmap program must use to assign appropriate Look Up Tables (LUTs) for generation of GOES-East and GOES-West Remap Lambert products. **NOTE:** *This program window may be deleted at any time **without killing the mail program**. Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.*
goesW.c	**Function:** **Inputs:** **Outputs:**	Main West AWIPS ingest program which analyzes West mail message contents, controls satellite source program switching and resets, identifies the broadcast pass; and launches the appropriate sequences of ADDE image pull shells accordingly to fill up area file ranges. The program also creates an independent broadcast pass identifier text flag file which the ginirmap program must use to assign appropriate Look Up Tables (LUTs) for generation of GOES-West Remap Lambert products. **NOTE:** *This program window may be deleted at any time **without killing the mail program.** Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.*

	Run string:	
ginifill.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Old version of lookup table generation program (for reference purposes only B not used for processing).
ginifill2.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Generate new or additional lookup tables used in ginirmap.c which relate chunks (64 lines) of ingested data online to allowable remapped lines out.
ginirmap.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Main image remap build program which analyzes incoming stretched GVAR data streams, generates AWIPS-compatible products, and moves products to a directory for dissemination by the FTP transfer subsystem. **NOTE:** *Deleting this program window will also kill the remap process. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs will cause severe GINI product anomalies.*
m0amem_.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Core McIDAS 7.xx utility program, which allocates memory buffers for inline image processing. To help optimize the remap processing time a change must be made to this file and McIDAS must be recompiled.
mc2awips.c	**Function:** **Inputs:** **Outputs:** **Run string:**	Converts an image from the McIDAS area file format into the final AWIPS required file format ready for transfer to the destination Network Control Facility.
xdump.c	**Function:**	Display utility program to view binary file contents as formatted hexadecimal character data.

	Inputs: **Outputs:** **Run string:**

6.2.2 System Programs

Summary Descriptions of ".profile, Korn Shell boot-related, crontab, and log cleanup programs=

File Name	Description
.profile	**Function:** UNIX profile executed upon account login. **NOTE** *that* ***.profile*** *startup program calls* ***differ between*** *SSD* ***GINI-2*** *and* ***Standard Operations****. Also* **NOTE** *that for GINI-2 .profile program startup calls for* ***all but the startgoes*.sh*** *are executed as nohup background tasks.*
crontab.def	**Function:** Definition of crontabs used for operations. To create crontabs use the UNIX command "crontab crontab.def=. To view crontab definitions use the UNIX command "crontab -l=.
sdilogclean.sh	Clean ingest log files in the system. Only keeps one weeks worth of ingest log files online at any given time. **Run string:**
startftp_east.sh	Start the East FTP transfer major subsystem. **NOTE:** *Deleting this program window* ***will also kill the FTP process****. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies.*** Launched from .profile as nohup background task. **Run string:**
startftp_west.sh	Start the West FTP transfer major subsystem. **NOTE:** *Deleting this program window* ***will also kill the FTP process****. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies.*** Launched from .profile as nohup background task. **Run string:**
startgini.sh	Start both the remap processing major subsystem and the FTP transfer major subsystem. **NOTE:** *Deleting either/both of the two resulting program (ginirmap and FTP) windows* ***will also kill the remap and FTP processes****. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies.*** Launched from .profile as nohup background task. **Run string:**

startgoes_east.sh	Start the East satellite ingest subsystem (SDI mail program and the SDI "C= mail processing and image retrieval program.). **NOTE:** *This program window may be deleted at any time* ***without killing the mail program****. Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.* Launched from .profile as active foreground task to avoid mail window termination errors on bootup. **Run string:**
startgoes_west.sh	Start the West satellite ingest subsystem (SDI mail program and the SDI "C= mail processing and image retrieval program.). **NOTE:** *This program window may be deleted at any time* ***without killing the mail program****. Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.* Launched from .profile as active foreground task to avoid mail window termination errors on bootup. **Run string:**
startmcidas.sh	Start a McIDAS session. **NOTE:** *stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies.*** **Run string:**
startremap.sh	Start the remap processing major subsystem. **NOTE:** *Deleting the resultant program window for the remap process* ***will also kill the remap process****. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies.*** **Run string:**
throttle.sh	Prune mail messages sent to quality control mail accounts to rotating 8 day archive files. **Run string:**

6.2.3 Korn Shell Programs

Summary Description of "Korn Shell applications=

File Name	Description
buildchunk.sh	Build chunk of data in AWIPS-compatible format as the EAST or WEST CONUS sector is being ingested. **Run string:**
buildheader.sh	Build AWIPS-compatible header at start of an EAST or WEST CONUS sector. **Run string:**
buildproduct.sh	Build AWIPS-compatible product for all sectors except EAST and WEST CONUS.

	Run string:
buildtrailer.sh	Build AWIPS-compatible trailer (alternating 0's and 255's pattern) for EAST or WEST CONUS sectors. **Run string:**
ftpproduct_east.sh	FTP sector/product dissemination shell script for EAST system. This is a major subsystem main program. It distributes the AWIPS GOES EAST remapped sector/product imagery and external products. **NOTE:** *Deleting this program window* ***will also kill the FTP process.*** *Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies****.* **Run string:**
ftpproduct_west.sh	FTP sector/product dissemination shell script for WEST system. This is a major subsystem main program. It distributes the AWIPS GOES WEST remapped sector/product imagery and external products. **NOTE:** *Deleting this program window* ***will also kill the FTP process****. Also* **NOTE** *that stopping and restarting the McIDAS sessions without also stopping and restarting the ginirmap and FTP programs* ***will cause severe GINI product anomalies****.* **Run string:**
goes_east.sh	Main East ingest mail shell which continuously scans assigned mail directory accounts for new ingest mail messages, logs mail to a queue file, parses individual mail messages to the ingest C-program, and deletes processed mail from main accounts. **NOTE:** *This program window may be deleted at any time* ***without killing the mail program.*** *Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.* **Run string:**
goes_west.sh	Main West ingest mail shell which continuously scans assigned mail directory accounts for new ingest mail messages, logs mail to a queue file, parses individual mail messages to the ingest C-program, and deletes processed mail from main accounts. **NOTE:** *This program window may be deleted at any time* ***without killing the mail program.*** *Performing an `SDIQC` in the McIDAS text window will restore the mail display to the monitor screen.* **Run string:**
makearea.east.sh	Make a McIDAS area out of the previously sent EAST AWIPS product and display results in the McIDAS image window. **Run string:**
makearea.west.sh	Make a McIDAS area out of the previously sent EAST AWIPS product and display results in the McIDAS image window. **Run string:**
sdiqc.sh	Tail SDI mail log and SDI “C= program logs into xterm windows for

	monitoring by user. **Run string:**

6.2.4 McIDAS Macro Programs

Brief Summary Description of “McIDAS MACRO programs=

File Name	Description
menu.mac	Allows the MENU command which resides in the McIDAS data directory to be executed by typing MENU at the McIDAS command line.
sdiqc.mac	Allows the sdiqc.sh script which resides in the McIDAS data directory to be executed by typing SDIQC at the McIDAS command line.

6.2.5 TCL/TK Programs

Brief Description of “TCL/TK menu programs and menu-related configuration=

File Name	Description
.menu__config	Configuration of menu options. Can be altered easily to modify, add, or delete options using vi editor.
.menu__program	Main menu TCL/TK program which reads the “.menu__config= configuration file and presents a menuing window to the user.
.menu__script-execsh	UNIX Korn shell script to execute subshells in an xterm window.
.menu__script-listprocesses	UNIX Korn shell script to list current system processes.
menu__script-opsmenu	UNIX Korn shell script to alter/set operational flags such as FTP transfer mode (enabled or disabled) and to kill or startup various subsystems.
.menu__script-satellitemode	UNIX Korn shell script to set or display operational satellite mode (valid modes are normal operations or eclipse operations). During eclipse mode the WEST feed will flow through the EAST GINI or the EAST feed will flow through the WEST GINI. **NOTE** *unique file contents across all platform accounts.*
.menu_loopdefDEFAULT	UNIX Korn shell script to define loops (this is not used in the GINI-2 system but must be present for the .menu__program to function properly.)

7 Algorithms

[Updated January 2003 - Patrick Otero]

The GINI application software ingests the Stretched GVAR satellite data stream from the GOES satellites. The application uses McIDAS utility programs to create special remapped McIDAS area files based on the image corner points and AWIPS sector/product requirements. The remapped McIDAS area files are transformed into the final AWIPS required format, which is specified for AWIPS distribution. AWIPS sector/product imagery files are then transferred to the AWIPS Network Control Facility for ultimate distribution to the National Weather Service.

7.1 Generating Remap files

[Updated January 2003 - Patrick Otero]

7.1.1 Corner Points

The GINI output imagery products are built to National Weather Service specifications that were determined by clearly defined AWIPS requirements. These sector/products corner points are described in the reference document AAppendix K - Data Acquisition Tables for System/Segment Specification (Type-A) AWIPS". This document was published by the NWS Office of Meteorology, Technology and Forecast Systems, dated 23-April-1996.

7.1.2 Image times

Image times of the processed GINI sector/product imagery data files is ingest event driven and determined by the incoming satellite stretched GVAR data ingests from the GOES satellites. There are no time schedules on the GINI system that drives the processing of the output products. The GINI is not schedule driven, it is event driven by the incoming data.

8 Product Accuracy

[Updated January 2003 - Patrick Otero]

GINI sector/product imagery execution and accuracy are at present evaluated by AWIPS analysts. Half-hourly monitoring of the system is performed by the SATEPS staff operators to verify and confirm that the product is produced according to expected requirements.

8.1 GINI execution validation

GINI application software processes run on the SGI Origin 2000 UNIX-based workstation triggered by the incoming GOES satellite data ingests. If the GINI processing encounters problems while ingesting, processing, or disseminating new sector/product remapped imagery data files, then the SATEPS operations staff personnel will detect and identify the problem, and will contact GINI system programmer and/or system administration personnel to troubleshoot, investigate, and implement corrective actions to restore GINI application functions and operations. Otherwise, there is no automated internal software checking on whether GINI processing is successful.

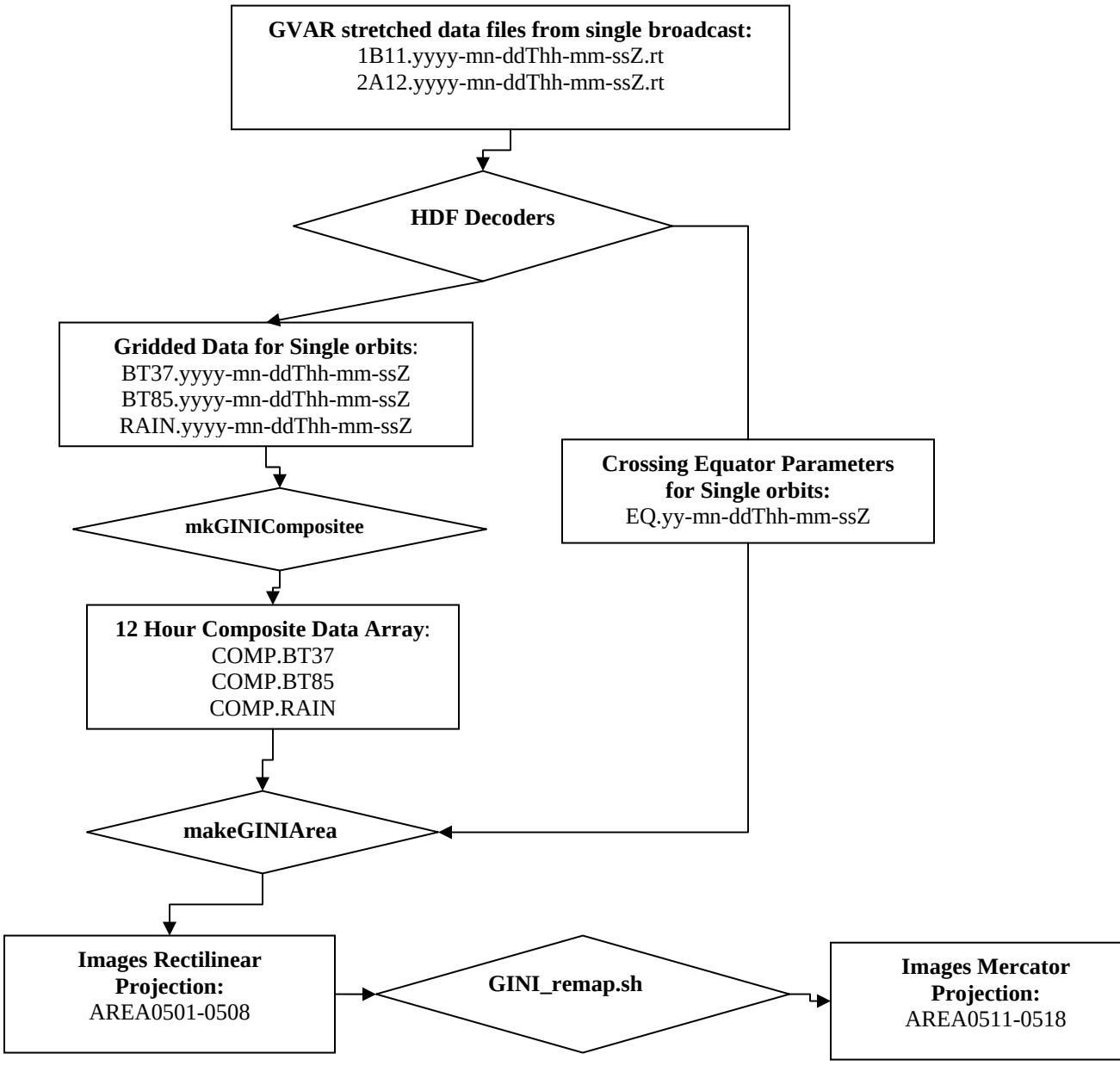
8.2 GINI output product validation

GINI product validation is performed by AWIPS analysts. The analysts compare output of the GINI system against expected GOES remapped data, and to the compared output from previous archived data by NWS. All conversions within the process have been verified by such comparisons. Verification of continuing correctness of the execution and of the output products is dependent on AWIPS analyst feedback.

9 Appendix A

9.1 Flow Chart of GINI Data Processing

[Update information]



Appendix B

9.2 Diagram of Call Sequence

[Update information]

& **proc_GINI.sh**
& getp_GINI_uniq.pl
& ftpGINI
& watchGINIFtp.sh
& prep_GINI.sh
& findGINIOrbits.sh <GINI Algorithm code>

<GINI Algorithm code>: 1B11, 2A12

& GINI_decoder_*xxxx* < orbit file>

< orbit file ": $GINI_input_dir/1B11.yyyy-mn-ddThh-mm-ssZ.rt $GINI_input_dir/2A12.yyyy-mn-ddThh-mm-ssZ.rt

& mkGINIComposite.sh <product code>
& mk_composite_GINI <orbit file list> < product code>

<orbit file list>: /tmp/1B11.list,/tmp/2A12.list <product code>: BT37, BT85, RAIN

& makeGINIArea.k <input file> <area num> <product code>

<input file>: $GINI_outputdata_dir/COMP.BT37 $GINI_outputdata_dir/COMP.BT85 $GINI_outputdata_dir/COMP.RAIN <area num>: 501-508 <product code>: BT37H, BT37V, 37PCT, BT85H, BT85V, 85PCT, RAIN, TCLW

& xing_GINI.sh
& GINI_remap.sh
& clean_GINI.sh
& trim_logGINI.sh

$GINI_inputdata_dir = /r00/snow/GINIdata/input
$GINI_outputdata_dir = /r00/snow/GINIdata/output

10 Appendix C

[Updated January 2003 - Patrick Otero]

10.1 Operator Procedures

PROCEDURE TO RECONFIGURE NPORT NETWORK CONNECTIONS

The following procedure describes how to reconfigure the GINI network connections on the NPORT systems to enable communications to any one of three NCF facilities. The current NCFs are: either the AWIPS-NCF, or the TEST-NCF, or the BACKUP-NCF.

Part I. First bring down all EAST and WEST processing on the NPORT system.

Select the satellite processing to bring down, either EAST <oper1> or WEST <oper2>.
Move the mouse cursor into the operational menu on the left side of display.
Click on the button GOES ASAT" OPS MENU. "SAT" means either EAST or WEST.
Click on the button STOP FTPB>NCF.
Click on the button KILL ALL "SAT" TASKS. ASAT" means either EAST or WEST.
All display windows and icons will disappear, except for the icon labeled Awinterm".
Click open the Awinterm" icon, and move the mouse cursor into this window.
Type in the word Aexit", followed by the <enter> key. This window disappears.
All the software processing for this satellite has now been stopped.
Repeat this APart I" process, starting at step1, to bring down the opposite satellite.

Part II. Next log in as user Aoperator" and reconfigure the network for this NPORT system.

Locate the TOOLCHEST menu on the right hand side of the NPORT-1 display.
Click on the SYSCONSOLE button near the bottom of the TOOLCHEST menu.
Choose the appropriate selection for CONSOLE NPORT-1 or CONSOLE NPORT-2.
You will see an open window on the NPORT display screen with a blue background. You should see the word AConnected" in the top left corner of the window.
Move the mouse cursor into this window, hit the <enter> key to obtain a login prompt.
You should see the prompt B> nportX console login: <-- where X means A1" or A2". Make sure you are talking to the correct NPORT system: either nport3 or nport4.
At the login prompt, you will log in as user --> operator
At the password prompt, you will type in --> V*br5D3"
You should see TERM = (vt100). Hit the <enter> key to continue.
Verify you are talking to the correct NPORT system. Read the directions on the screen.
Select the desired network configuration by typing in the full name of the connect script. You will type in either: Aconnect_to_AWIPS_NCF" or Aconnect_to_BACKUP_NCF" or Aconnect_to_TEST_NCF".
The NPORT system will reconfigure its own network, and then it will reboot itself. You will see the NPORT system run some self diagnostic programs on itself. It will verify and test all of its internal hardware. It will boot the UNIX operating system. All together, the boot process will take about four minutes to complete.
When you see the prompt AnportX console login:" at the bottom of the window, it means the boot

process is now complete. At this point, you may close the CONSOLE window.

Part III. You can now bring up all EAST and WEST processing on the NPORT system.

Click on the DESKTOP button on the TOOLCHEST menu. The TOOLCHEST menu is usually located close to the right-hand edge of the NPORT display screen.
Click on the OPEN UNIX SHELL button.
Type Atelnet nportX", where X means A1" or A2", to begin communication with the appropriate NPORT system.
On the bottom of the display, click on the satellite button to select either EAST or WEST.
At the login prompt, you will log in on the user account as --> Aoper1" for EAST, or Aoper2" for WEST <B as appropriate.
At the password prompt, you will type in --> B*st1$ch
Resize the various display windows to your preference and to your convenience.
The processing for this satellite is now up and running.
Repeat this APart III" process again, starting at step 1, to bring up the opposite satellite.

Part IV. The reconfiguration is now complete. You can verify the connections are correct.

There are normally five icons at the top of the display for each satellite.
Click on the icon with the label of FTPxfer.
The FTPxfer icon will open to a window, and you will see the various FTP statements scrolling up the screen.
You should be able to verify that your current FTP dissemination process from this NPORT system by looking for the words: AACTIVE / ENABLED" which means you are currently sending products at this time, or AINACTIVE / DISABLED" which means you are not sending products.
At the tail end of the same line, you will be able to verify that your NPORT system is currently configured for dissemination to a NCF facility by looking for the appropriate identifier: AANCF" meaning the AWIPS-NCF, or ATNCF" meaning the TEST-NCF, or ABNCF" meaning the BACKUP-NCF.
Minimize the FTPxfer window back into an icon.
You should see five icons at the top of the display.
If required for this system, start up the FTP product disseminations to the NCF that you have configured on this NPORT system.
You are now done.

11 Appendix D

S

S Acronyms and Abbreviations

[Updated January 2003 - Patrick Otero]

AWIPS	Advanced Weather Information Processing System
CDA	Command and Data Acquisition
SSEC	Space Science Engineering Center
NESDIS	National Environmental Satellite, Data, and Information Service
NCF	Network Control Facility
NASA	National Aeronautics and Space Administration
McIDAS	Man computer Interactive Data Access System
NOAA	National Oceanic and Atmospheric Administration
SOCC	Satellite Operations Control Center
GPMM	GINI Program Maintenance Manual
SATEPS	Satellite Environmental Processing System
SGI	Silicon Graphics Inc.
GINI	GOES Ingest and NOAAPort Interface
SDI	SSEC Desktop Ingestor
GOES	Geostationary Operational Environmental Satellite

12 Appendix E

S McIDAS Modifications

Several local modifications to McIDAS 7.xx were necessary to optimize operations. The first modification involves the optimization of memory usage for the “IMGCOPY= and “IMGREMAP= commands to significantly improve cycle times. The program “/usr/people/mcidas/mcidas7.xx/src/m0amem_.c= must be altered to increase the memory buffer for inline image copies. After the modification McIDAS needs to be recompiled.

To alter “/usr/people/mcidas/mcidas7.xx/src/m0amem_.c= search for the line

if(num_bytes “ 3000000) store_type = 2;

and replace with

if(num_bytes " 105000000) store_type = 2;

This change increases inline buffer memory from 3Mbytes to 105Mbytes which prevents unnecessary creation of temporary files when working with source areas which are less than 105Mbytes in size. All remap areas utilized by the GINI system are under 105Mbytes in size.

The second modification involves changes which allow maximal optimization of both "C= and "FORTRAN= programs. In McIDAS 7.xx the install script "/usr/people/mcidas/mcidas7.xx.sh= and the supporting compilation program "mccomp.sh= need modification to ensure that the "-O3' maximal optimization parameter is enabled for both "C= and "FORTRAN= compilation.

To alter the "/usr/people/mcidas/mcidas7.xx.sh= file search for all occurrences of

DEBUG=-O

and replace with

DEBUG=

Note that the DEBUG keyword apparently has a default for optimization level one. We must disable this because this "-O= gets tacked on to the end on the compile line and apparently overrides the level three "-O3' optimization option.

To alter the "/usr/people/mcidas/mcidas7.xx/src/mccomp.sh= file search for the two comment lines below

by default use gcc and f2c. Specify "mccomp -vendor= to use vendor supplied
compilers

and then replace the line

ccopts=

with the line

ccopts="-O3"

and then replace the line

fcopts=

with the line

fcopts="-O3"

Note that the ccopts specifies options for the "C= compiler and fcopts specifies options for the "FORTRAN= compiler.

To recompile McIDAS type the four UNIX commands as user McIDAS:

```
cd /usr/people/mcidas/mcidas7.xx/src
rm *.o
cd /usr/people/mcidas
/bin/sh mcidas7.xx.sh make
```

When the make is done, install the newly compiled McIDAS version with the UNIX command:

```
/bin/sh mcidas7.xx.sh install
```

Check to make sure the "-O3' optimization is on all "C= and "FORTRAN= programs by viewing the McIDAS log output file "/usr/people/mcidas/mcidas7.xx/src/makelog=.

13 Appendix F

- Interface Control Document (ICD) for AWIPS - NESDIS

  Include here the reference document AInterface Control Document (ICD) for AWIPS - National Environmental Satellite, Data, and Information Service (NESDIS)". This document was published by the AWIPS Program Office, AWIPS document number # AA0130008 CH-2, August 1, 1999.

- AWIPS Sector/Products

  - GOES Image Sector/Products Created by GINI-2

    ****** Include here the reference document AAppendix K - Data Acquisition Tables for System/Segment Specification (Type-A) AWIPS". This document was published by the NWS Office of Meteorology, Technology and Forecast Systems, dated 23-April-1996. ******

  - External Products Created Outside GINI-2

    ****** Include here the reference document AGOES-I/M Sounder Derived Product Imagery (DPI)". This document was published by Curtis Holland of NESDIS/IPB. ******