NWS EHB 6-536
AF TO 31P1-4-108-461-1
NAVY EM400-AT-OPI-010
REVISION NO. 1

TECHNICAL MANUAL

OPERATIONS INSTRUCTIONS
OPEN PRINCIPAL USER PROCESSOR (OPUP)

DOPPLER METEOROLOGICAL RADAR
WSR-88D

OFFICE OF PRIMARY RESPONSIBILITY:
NATIONAL WEATHER SERVICE RADAR OPERATIONS CENTER

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FOREWORD

This technical manual provides operators with an overview of Doppler Meteorological Radar WSR-88D Open System Principal User Processor (OPUP). It describes the purpose, structure, and functions of the OPUP and discusses the operating concepts. It consists of ten chapters, a glossary, and an index.

Chapter 1 - Describes the purpose of this manual and provides introductory WSR-88D information, operating concepts, and general purpose reference information.

Chapter 2 - Describes the OPUP system hardware and software to include the operating system, Common Desktop Environment (CDE), background processes, and operations applications.

Chapter 3 - Provides information on requesting products and controlling product data flow into the OPUP database. Additionally, step-by-step procedures for creating and modifying request lists and initiating one-time requests are included.

Chapter 4 - Provides information concerning the display of WSR-88D product data. Additionally, step-by-step procedures for displaying and manipulating products as well as initiating One-Time Requests from this GUI are included.

Chapter 5 - Explains the OPUP alerting functionality and provides detailed procedures for managing the alert processing function in OPUP.

Chapter 6 - Provides an overview of OPUP and WSR-88D system status and communications. Additionally, detailed procedures for accessing and tailoring OPUP status screens and for controlling and managing OPUP dedicated and dial communications are provided.

Chapter 7 - Explains the OPUP Archiving function and provides step-by-step procedures for product and status information archival and retrieval.

Chapter 8 - Explains the OPUP auto-dialing function and provides detailed procedures for editing and managing the auto-dial lists.

Chapter 9 - Provides an overview the OPUP adaptation data philosophy, default values, as well as detailed procedures for modifying and managing OPUP adaptation data. Provides the information required to manage and control WSR-88D product distribution of other display and distribution platforms.

Chapter 10 - Provides for the editing and creation of displayable background maps.

Appendix A Operating Function Overview

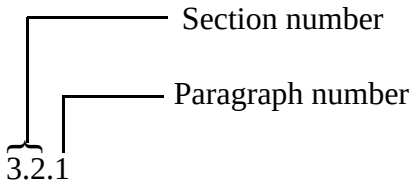
Index

Glossary

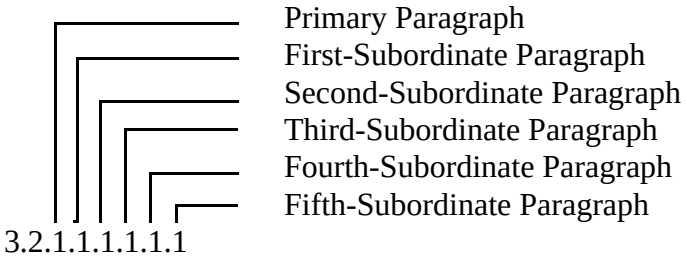
This manual is one of a family of technical manuals which provide various levels of description, operation, maintenance, and logistics information on the WSR-88D. Refer to TO 31-1-141, Basic Electronic Technology and Testing Practices, for any basic electronic technology or testing practice that is not fully described in these documents. The WSR-88D technical manual family is defined and discussed in NWS EHB 6-500 System Manual.

The format of this technical manual is as follows:

- Since sections represent the major content divisions of the chapter, they are formatted as physically-separate standalone elements.
- Sections are numbered as subdivisions of the chapter or appendix. The section numbering system consists of two digits separated by a decimal point. The first digit indicates the chapter, the second digit indicates the section. Thus, Section 3.2 represents the second section of Chapter 3.
- Paragraph numbering is by section rather than by chapter. The basic numbering system consists of three digits, where the first two digits identify the section



- A decimal paragraph number system is used to identify paragraph subordination



- Pages, tables, and figures are numbered by chapter. The number consists of two digits separated by a hyphen. The first digit identifies the chapter. The second digit identifies the table or figure.

SAFETY SUMMARY

GENERAL SAFETY

The following are general safety precautions that are not related to specific procedures, and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position due to charges retained by capacitors. To avoid casualties, always remove power and discharge by grounding a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter an enclosure for the purpose of servicing or adjusting the equipment except in the presence of some one who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltage should be familiar with modern methods of resuscitation. Such information may be obtained from the Red Cross or Heart Association. This knowledge may save a life.

PERFORM WORK RAPIDLY

When working in areas designated as hazardous, perform work using the proper safety procedure. Be thoroughly familiar with the procedures required for the task before entering the area.

SECURE ALL MATERIAL WHEN NOT IN USE

Secure all tools, chassis, and covers before operating equipment.

DO NOT USE METAL TOOLS NEAR EXPOSED PARTS

Do not use brushes, brooms, or other tools that have exposed metal parts within four feet of any electrical equipment having exposed current-carrying parts.

ELECTRICAL SHOCK HAZARDS

Prime power voltages and high voltages within cabinets can cause death or severe injury. These voltages are contained in the generator, RPG, RDA, and Antenna areas. Warning signs and labels

are located on the guards and barriers to alert personnel of the potential hazard. Do not disregard these warnings. Ensure that safety interlocks, barriers, and guards are not bypassed.

CHAPTER 1
GENERAL INFORMATION

Section 1.1. INTRODUCTION

The Open Principal User Processor (OPUP) Group is the baseline WSR-88D product acquisition, storage, and display system for the Air Force Weather Agency (AFWA) and Naval Meteorological and Oceanography Command.

Scalability of the hardware and software enables the OPUP to support the multi-user, multi-radar environment of the Operational Weather Squadrons (OWSs), as well as scale down to cost-effectively support the single radar, single workstation sites.

The OPUP software design is comprised of specialized, independent software applications for product request, storage, distribution, and display and manipulation. It also supports alert processing, adaptation data entry and control, communications control, and status monitoring. The implementation of the independent OPUP application software design allows only those applications required to support the operator at that moment to be active. This design ensures efficient, effective utilization of computer resources and reduces the bandwidth required to support an integrated weather display system.

The OPUP system enhances operational usability and application interaction and control through a user-friendly, intuitive, graphical user interfaces (GUI). The point and click GUI design simplifies system orientation and training and streamlines operations.

1.1.1 Purpose of Manual.

The purpose of this manual is to provide the user with:

1. A high-level hardware and software overview.
2. An OPUP Applications software functions overview.
3. Detailed information on how to operate the OPUP and interact with individual applications.

Included in this manual are:

- OPUP Group hardware configurations.
- Operating System and Application software descriptions.
- Relevant operations-oriented GUI interaction and functions.
- Definitive step-by-step instructions for product request and manipulation, adaptation data control, communications control, and status monitoring using the OPUP Applications software GUI interfaces.

1.1.2 Scope of Manual.

This manual provides the information and procedures enabling the user to exercise all capabilities and functions available as of the release and/or change date of this document. It is divided into 10 chapters. The title and a brief description of each are provided below:

- Chapter 1 GENERAL INFORMATION - Describes the purpose of this manual and provides introductory WSR-88D information, operating concepts, and general purpose reference information.

- Chapter 2 OPUP SYSTEM DESCRIPTION - Describes the OPUP system hardware and software to include the operating system, Common Desktop Environment (CDE), background processes, and operations applications.

- Chapter 3 OPUP PRODUCT REQUEST GUI - Provides information on requesting products and controlling product data flow into the OPUP database. Additionally, step-by-step procedures for creating and modifying request lists and initiating one-time requests are included.

- Chapter 4 OPUP PRODUCT DISPLAY AND MANIPULATION - Provides information concerning the display of WSR-88D product data. Additionally, step-by-step procedures for displaying and manipulating products as well as initiating One-Time Requests from this GUI are included.

- Chapter 5 OPUP METEOROLOGIAL ALERT PROCESSING - Explains the OPUP alerting functionality and provides detailed procedures for managing the alert processing function in OPUP.

- Chapter 6 STATUS AND CONTROL - Provides an overview of OPUP and WSR-88D system status and communications. Additionally, detailed procedures for accessing and tailoring OPUP status screens and for controlling and managing OPUP dedicated and dial communications are provided.

- Chapter 7 OPUP ARCHIVE - Explains the OPUP Archiving function and provides step-by-step procedures for product and status information archival and retrieval.

- Chapter 8 OPUP AUTO-DIAL FEATURE - Explains the OPUP auto-dialing function and provides detailed procedures for editing and managing the auto-dial lists.

- Chapter 9 ADAPTATION DATA CONTROL - Provides an overview the OPUP adaptation data philosophy, default values, as well as detailed procedures for modifying and managing OPUP adaptation data. Provides the information required to manage and control WSR-88D product distribution of other display and distribution platforms.

- Chapter 10 MAP EDIT GUI - Provides for the editing and creation of displayable background maps.

Section 1.2. GENERAL INFORMATION

This chapter is organized into sections as follows:

- Section 1.1. INTRODUCTION. - Provides an introduction to the OPUP System and provides an overview of the OPUP operator documentation suite.
- Section 1.2. GENERAL INFORMATION. - Describes the various sections of Chapter 1.
- Section 1.3. INTRODUCTION TO THE WSR-88D. - Provides an introduction to the WSR-88D System which includes the Radar Data Acquisition (RDA) unit, Radar Product Generator (RPG), and the OPUP.

Section 1.3. INTRODUCTION TO THE WSR-88D

1.3.1 Introduction.

The WSR-88D is a radar designed, procured, owned, managed, and operated by three agencies of the federal government. Within the WSR-88D program, the three principal user agencies are the Department of Commerce (DOC), Department of Transportation (DOT), and the Department of Defence (DoD). These agencies are represented by the National Weather Service (NWS), Federal Aviation Administration (FAA) and the Air Force Weather Agency (AFWA), respectively.

1.3.2 Overview of the WSR-88D System.

The WSR-88D system is comprised of three major hardware groups; the Radar Data Acquisition (RDA), the Radar Product Generator (RPG), and the product display workstation group which, for the DoD, is either the Principal User Processor (PUP) or the Open Principal User Processor (OPUP). For the purposes of this manual, only the RDA, RPG, and OPUP will be addressed.

1.3.2.1 Radar Data Acquisition (RDA) Group. The RDA equipment group is made up of four primary subcomponents: transmitter, antenna, receiver, and signal processor. These subcomponents generate and radiate radio frequency (RF) pulses, receive reflected energy from those pulses, and process this received energy into digital base data.

The first step in acquiring radar data is the transmission of an RF signal. This is accomplished by the transmitter using a klystron amplifier (as opposed to magnetrons used by older radars) which generates a high-power (750 kW peak), very stable, ten centimeter wavelength RF pulse.

The antenna is the RDA subcomponent that broadcasts the RF signal out into the atmosphere and intercepts returning energy. The antenna has a positioning range of -1.0° to 45.0° in elevation. Within this range, the antenna angles are set according to the following:

- which scan strategy is being used,
- which Volume Coverage Pattern (VCP) is selected, and
- which operational mode (clear or precipitation) is being employed.

NOTE

The radar operator cannot manually position the radar at a given elevation or azimuth.

As the antenna intercepts returning (backscattered) energy, it routes the signal to the receiver subcomponent of the RDA. Since the amount of returning energy is minute as compared to that originally emitted, the signal must be amplified by the receiver before it is sent to the analog-to-digital (A/D) converter. The resulting digital signal is then sent to the signal processor component of the RDA.

Upon reception of the digital signal from the receiver, the signal processor accomplishes three important functions:

- ground clutter suppression
- calculation of the digital base data
- range unfolding of Doppler data

The first task of the signal processor is to convert the digital signal from the receiver into three types of digital base data:

- base reflectivity
- base mean radial velocity
- base spectrum width

Multiple trip echoes cause a phenomenon known as range folding, which occurs in the velocity and spectrum width data. An important task of the signal processor is to unfold these returns using input from the base reflectivity data.

One of the main distinctions between returns from atmospheric scatterers and those from ground targets is that ground returns have little or no motion. Using velocity as the determining factor, the signal processor will suppress the returns from targets who's velocity falls within an operator specified velocity interval centered around zero. These returns are considered to have come from ground clutter (return with near zero velocity) and are removed from consideration prior to the calculation of the base data estimates.

Although no Archive Level I data storage device has been fielded, this level of data recording is intended to be used for raw analog signal output collection from the receiver.

The RDA maintenance terminal is used to set up the RDA, control the RDA locally (i.e., at the RDA shelter), and to control/monitor RDA maintenance functions. Many of the RDA maintenance terminal control functions can also be performed remotely.

The RDA and the RPG are linked by a wideband which provides high speed (1.54 million bits/second), full duplex (simultaneous, 2-way) data transmission between the RDA and RPG. The descriptor "wideband" is used because a relatively wide frequency band is necessary to transmit data at such a fast rate. Depending on the RDA-RPG separation distance and local requirements, the wideband link at a particular site may be:

- Direct wire link - this type of wideband link is usually used when the distance between the RDA and RPG is between 0 and 400 feet.
- Microwave Line-Of-Site (MLOS) - used for distances between 3,280 feet and 25 miles.
- T1 - a T1 is a high speed commercial or private link which can be used for distances greater than 11 miles.

1.3.2.2 Radar Product Generator (RPG). The RPG is a multi-function unit that ingests, processes, and produces products from the digital base data received from the RDA via wideband

communications and distributes those products to the users via narrowband communications. The RPG also serves as the command center through which control over the entire system is applied and is the site of the new Archive II LDM Data archiving function.

Based on operator input, the RPG generates products on a volume scan-by-volume scan basis. The RPG creates base products (Base Reflectivity, Base Velocity, and Base Spectrum Width) at operator specified elevations directly from the digital base data received from the RDA. Derived products are also produced by the RPG using digital base data as input. Any product other than the three base types can be considered a derived product. A good example of this type of product is Composite Reflectivity where an algorithm determines the maximum reflectivity for each grid box for all elevation angles and composites them into a single product. Other types of derived products include vertical cross sections of the three base data types, precipitation accumulation products, Tornadic Vortex Signature (TVS), and many others.

Archive II LDM Data are a specific set of products which are generated each volume scan. The specific products are subsequently sent to the National Climatic Data Center (NCDC).

The Radar Product Generator/Human Computer Interface (RPG/HCI) portion of the Master System Control Function (MSCF) directly controls RPG operation and performance. This includes wideband and narrowband communications control, product generation, and parameter selection for optimizing products. Additionally, the HCI allows the operator to control the RDA.

The HCI offers comprehensive status information on the condition of the RDA, the RPG, and certain users. This information must be monitored frequently to ensure proper system operation so that all users continue to receive quality products.

As part of various operations at the HCI, users of that RPG's products need to be informed of any tasks that will impact their access to those products. The Free Text Message (FTM) is an efficient tool for informing users of any upcoming interruptions in their products. One example would be an upcoming RPG reboot, including resetting the communications hardware at the RPG.

The data that each WSR-88D site generates is available to numerous users for interpretation and decision making. Poor data quality can make product interpretation difficult and can sometimes impact critical decisions. The HCI offers each site the tools to generate the best quality data that is possible with current system engineering and design.

As products are generated by the RPG, they are sent to the various users over narrowband lines, which have a 14,400 bits/second transmission rate. One exception to this is the NWS Advanced Weather Interactive Processing System (AWIPS) which employs either a 56,000 bits/second direct link to the RPG or a LAN-to-LAN connection.

1.3.2.3 Open Principal User Processor (OPUP). The OPUP is a DoD only system for acquiring, displaying, and manipulating WSR-88D products.

The OPUP provides for multiple dedicated and dial-in RPG communication links, provides services for product storage and retrieval, and supports multiple workstation positions for product display and manipulation.

1.3.3 WSR-88D Operations Overview.

The three principal user agency representatives have a common requirement for weather radar data on a continuous basis. Therefore, for any radar providing weather radar data to more than one principal user agency, one of the basic operational requirements is that the RDAs/RPGs be operated continuously, 24 hours a day, in predefined scanning modes and provide a set of data and products which have been approved by the user agencies. The principal users define the operational modes for the WSR-88D system. These operational modes are a function of the weather conditions, season, and location of the radar. During operations, the antenna is controlled by automatic scanning programs. Different volume coverage patterns, which are matched to the operational mode, are available to optimize the product generation for the particular type of weather situation. The use of different volume coverage patterns and meteorological algorithm groupings is governed by strict interagency protocol whenever two or more agencies are using the weather information generated by the site (in the case of DoD, interagency agreements are established for each site). For any operational mode, radar scanning is continuous in time, to support the various needs of the users. Any exception to continuous scanning requires the concurrence of all principal users. At all times, principal users' units are informed of the radar scanning program in use through the use of system status and product header data. There are two currently defined operational modes of operation which are used to acquire the meteorological data necessary to detect the weather and translate the results into products. These products are displayed at the product display workstations to allow the user to make quick and accurate judgments on the impact of the detected weather on any operation being monitored. The operational modes are the Clear Air Mode and the Precipitation Mode. The Clear Air Mode can be selected manually only. The Precipitation Mode can be selected manually at any time and is also selected automatically whenever the system detects precipitation (based on pre-determined values and area coverage of precipitation-like returns).

CHAPTER 2
OPUP SYSTEM DESCRIPTION

Section 2.1. INTRODUCTION

2.1.1 General.

Chapter 2 provides a description of the Open Principal User Processor (OPUP) system hardware and software to include the operating system, Common Desktop Environment (CDE), background processes, and operational applications.

2.1.2 Chapter Organization.

Chapter 2 is organized into six sections as follows:

- Section 2.1. INTRODUCTION - Provides descriptions of the contents of each section of Chapter 2.
- Section 2.2. OPUP OPERATIONAL CONCEPT - Provides an overview of the OPUP application software components.
- Section 2.3. OPUP HARDWARE OVERVIEW - Provides an overview of the OPUP hardware and the information on the basic function of selected components.
- Section 2.4. LOG-IN AND USER ACCOUNTS - Access to the OPUP is restricted to authorized user accounts. This section provides general information about user accounts and logins.
- Section 2.5. OPERATING SYSTEM OPERATOR INTERACTION - Provides a limited overview of the OPUP (UNIX) Common Desktop Environment.
- Section 2.6. BACKGROUND PROCESSES - Provides a brief discussion of the background software programs that provide for communications, data base management, and general server and housekeeping functions.

Section 2.2. OPUP OPERATIONAL CONCEPT

2.2.1 Introduction.

OPUP design is based on the client-server model. This model promotes the use of high-powered computers (servers) to execute server-based applications that provide data via a private Local Area Network (LAN) to many, physically remote workstations (clients). The implementation of this design allows WSR-88D data to be displayed and manipulated on numerous independent workstations yet be managed via one central resource.

Scalability is a significant improvement realized by the OPUP design model. By simply adding additional plug-and-play hardware resources, this design allows for the cost-effective support of single radar, single workstation locations, as well as, scaling up to support the multi-user, multi-radar environment of the large forecast installations.

2.2.2 OPUP Applications.

The OPUP Applications software suite is divided into independent applications. Each application is responsible for a subset of the OPUP functionality. This design ensures that CPU resources are not used to support applications that are not needed by the operator at that time. For example, the Product Request application is used to define and send product requests to the RPG. Once this task is complete, the product request application may be closed freeing the CPU and memory resources for another application. Individual applications may be started/stopped without affecting other applications.

All OPUP applications execute (run) on the host OPUP server, be it a Large OPUP configuration (dual server, multi-processor system) or a Small OPUP configuration (single server, single processor system). See Section 2.3 for a detailed description of each OPUP configuration.

2.2.3 OPUP Data Flow.

WSR-88D product and message data are received by the OPUP server via dedicated and dial-out communications lines in response to OPUP requests and RPG status changes. These data are then stored in local storage and, when requested, either;

- ***Networked (server-client) configuration*** - sent via a dedicated OPUP LAN connection to the requesting workstation for display and manipulation, or
- ***Non-networked configuration*** - displayed directly on the local OPUP monitor.

Section 2.3. OPUP HARDWARE OVERVIEW

2.3.1 Introduction.

There are three OPUP configurations: Large, Medium, and Small. Each configuration is designed to cost-effectively meet radar data acquisition and display requirements for the specific supported location. Each OPUP includes all the communications and data processing hardware and software required to acquire, manage, and manipulate WSR-88D product data. This section provides an overview of the hardware for each configuration.

2.3.2 Large OPUP Hardware Description.

A schematic of the Large OPUP configuration is provided in Figure 2-1. A general description of each major hardware component is provided below. Additionally, where warranted, an operational overview is also provided.

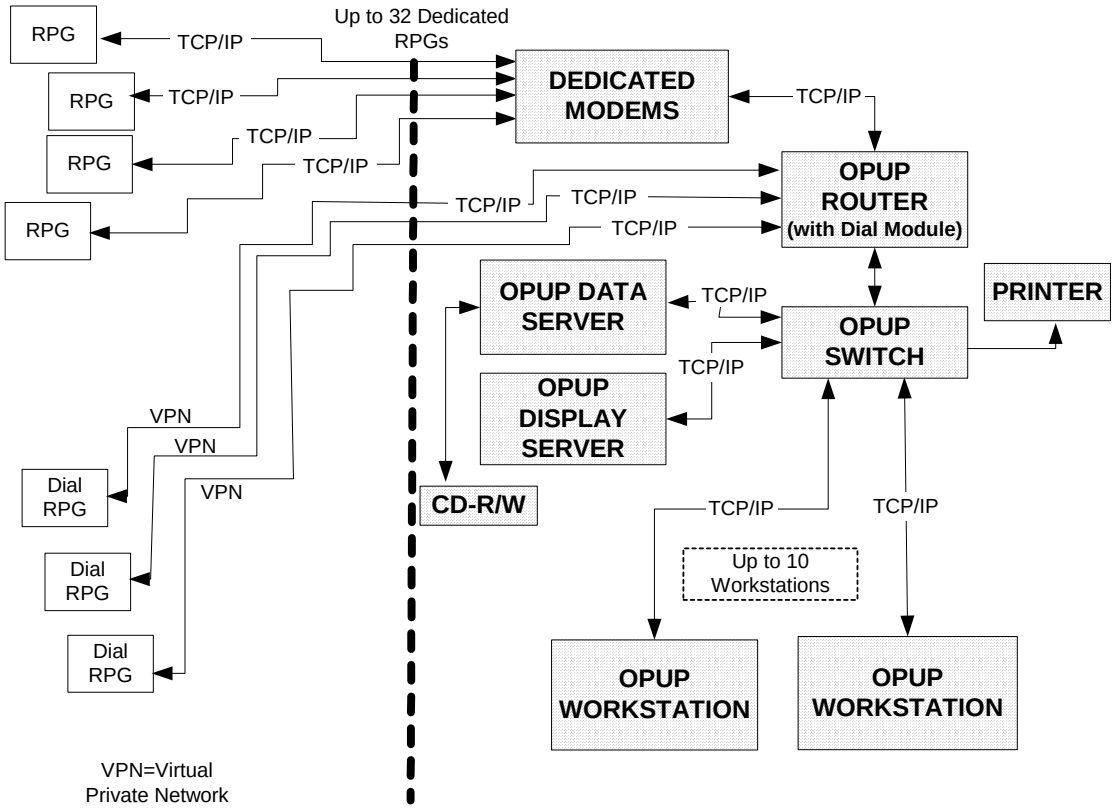


Figure 2-1. Large OPUP System

2.3.2.1 Narrowband Communication Equipment. All narrowband communications equipment to support dedicated and dial-out (OPUP-to-Radar Product Generator (RPG)) communications is

included as part of the OPUP system. The major communications components include the modem chassis, modems (dedicated), and a router.

2.3.2.1.1 Dedicated Modem Nest Assembly. Two modem chassis are used to house, provide in-cabinet connections, and supply power to the dedicated narrowband communications modems.

2.3.2.1.2 Modems. The OPUP utilizes rack mounted dedicated modems. These modems use TCP/IP protocol to transfer data to and from the RPG via dedicated phone lines. The modems support transmission speeds up to 14.4 kbps across 4-wire dedicated circuits.

2.3.2.1.3 Router. The OPUP router has two auto-sensing 10/100 Ethernet ports, four 8-port dedicated communications modules, and one 8-port dial module. A Cisco router provides the interface to transfer the data between the modem chassis and the OPUP server. The router also provides for the data transfer between the OPUP system and local base LAN.

2.3.2.2 Local Area Network (LAN) Smart Switch. This switch provides inter-process communication and data transfer between OPUP components. The switch acts as the OPUP traffic cop by directing all inter-component messages and commands to the appropriate destination.

2.3.2.3 Sun 280R Server. The Large OPUP uses two servers - one for data processing, reformatting and transfer and the other for user display processing. Each server employs two 900 MHz or greater processors and includes 2 GBytes of RAM.

To load software, a CD-ROM drive is installed. Two hard drives, a primary system drive and secondary storage drive, are installed in the system. The primary hard drive is used for system programs an the secondary drive is used solely for product and status message storage.

2.3.2.4 Maintenance Monitor and Keyboard. A 17-inch color monitor, keyboard, and mouse used for system maintenance and administration. The monitor, keyboard, and mouse are used to access both servers via a KVM switch.

2.3.2.5 CD-R/W. Archive IV data are recorded to CD-ROM media using a CD-R/W drive installed in the communications cabinet. Additionally, this device is used to locally store adaptation data.

2.3.2.6 Color Printer. A network-capable, postscript color printer is part of the standard configuration. If a printer is connected, it must be installed via the OPUP Manager function.

2.3.2.7 Uninterruptible Power Supply (UPS). Uninterruptible power supplies provide uninterrupted AC power for all components in the OPUP Processor/Communications Assembly. Each UPS comes with Powerchute software which supports automatic shutdown of the attached servers.

2.3.3 Medium OPUP Hardware Description.

A schematic of the Medium OPUP configuration is provided in Figure 2-2. A general description of each major hardware component is provided below. Additionally, where warranted, an operational overview is also provided.

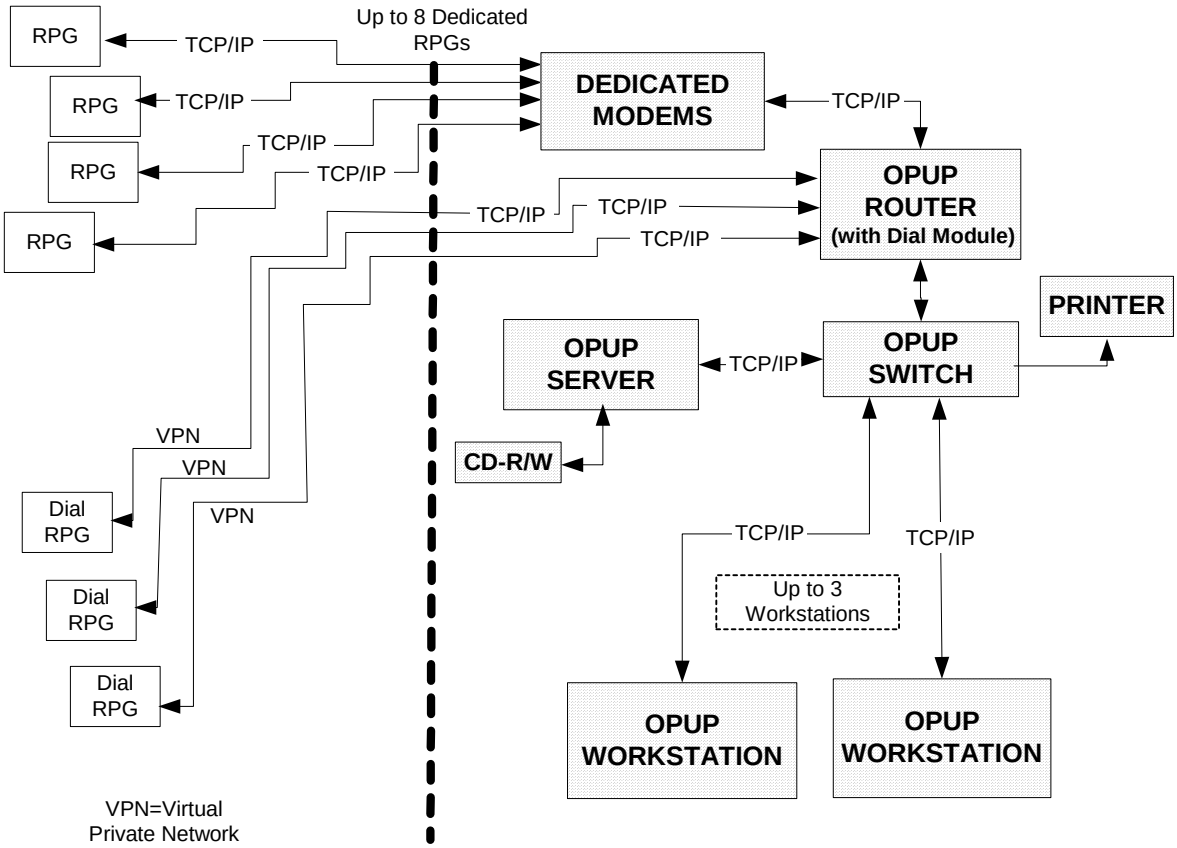


Figure 2-2. Medium OPUP System

2.3.3.1 Narrowband Communication Equipment. All narrowband communications equipment to support dedicated and dial-out (OPUP-to-RPG) communications is included as part of the OPUP system. The major communications components include the modem chassis, modems (dedicated), and a router.

2.3.3.1.1 Dedicated Modem Nest Assembly. One modem chassis is used to house, provide in-cabinet connections, and supply power to the dedicated narrowband communications modems.

2.3.3.1.2 Modems. The OPUP utilizes rack mounted dedicated modems. These modems use TCP/IP protocol to transfer data to and from the RPG via dedicated phone lines. The modems support transmission speeds up to 14.4 kbps across 4-wire dedicated circuits.

2.3.3.1.3 Router. The OPUP router has two auto-sensing 10/100 Ethernet ports, one 8-port dedicated communications module, and one 8-port dial module. A Cisco router provides the interface to transfer the data between the modem chassis and the OPUP server. The router also provides for the data transfer between the OPUP system and local base LAN.

2.3.3.2 Local Area Network (LAN) Smart Switch. This switch provides inter-process communication and data transfer between OPUP components. The switch acts as the OPUP traffic cop by directing all inter-component messages and commands to the appropriate destination.

2.3.3.3 Sun 280R Server. The Medium OPUP uses one server. The server is a multi-processor system that uses two UltraSparc 900 MHz or greater processors. The OPUP server has 2 GBytes of RAM.

To load software, a CD-ROM drive is installed. Two hard drives, a primary system drive and secondary storage drive, are installed in the system. The primary hard drive is used for system programs an the secondary drive is used solely for product and status message storage.

2.3.3.4 Maintenance Monitor and Keyboard. A 17-inch color monitor, keyboard, and mouse are used for system maintenance and administration.

2.3.3.5 CD-R/W. Archive IV data are recorded to CD media using a CD-R/W drive installed in the communication cabinet. Additionally, this device is used to locally store adaptation data.

2.3.3.6 Color Printer. A network-capable, postscript color printer is part of the standard configuration. If a printer is connected, it must be installed via the OPUP Manager function.

2.3.3.7 Uninterruptible Power Supply (UPS). Uninterruptible power supplies provide uninterrupted AC power for all components in the OPUP Processor/Communications Assembly. Each UPS comes with Powerchute software which supports automatic shutdown of the attached servers.

2.3.4 Small OPUP Hardware Description.

The Small OPUP is designed to fit on a desktop, see Figure 2-3 for a schematic. A general description of each major hardware component is provided below. Additionally, where warranted, an operational overview is provided.

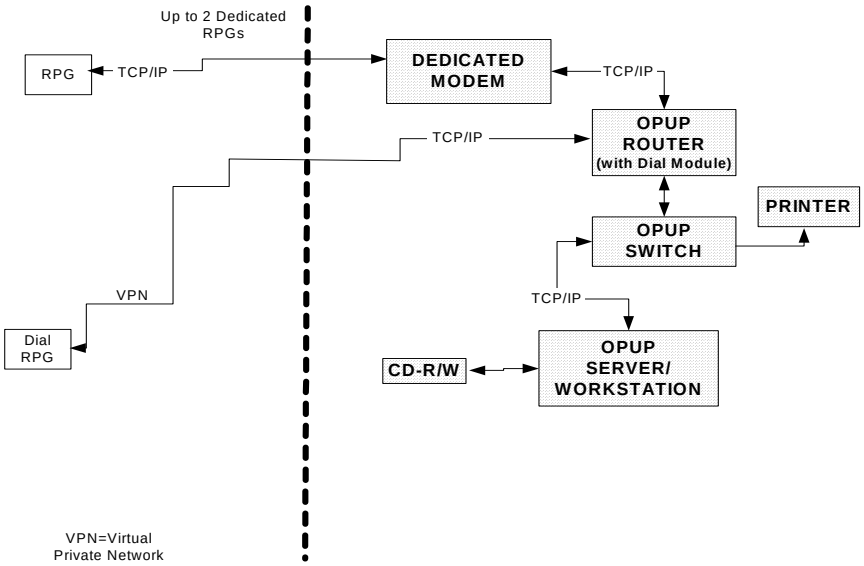


Figure 2-3. Small OPUP System

2.3.4.1 Processor. The WSR-88D product and message data are processed on the Server UD86A2. A standard diskette (floppy) drive is included; however, this drive is disabled via the operating system.

To load software, a CD-ROM drive is included. Two hard drives, a primary system drive and secondary storage drive, are installed in the system. The primary hard drive is used for system programs. The secondary drive is used specifically for product and status message storage.

2.3.4.2 Communications. All narrowband communications equipment to support dedicated and dial-out (OPUP-to-Radar Product Generator (RPG)) communications is included as part of the OPUP system. The communications components consist of a dedicated modem and a Cisco router.

2.3.4.2.1 Dedicated Modem. The Small OPUP utilizes a desk top dedicated modem for dedicated communications. The modems use TCP/IP protocol to transfer data to and from the RPG via dedicated phone lines. The modems support transmission speeds up to 14.4 kbps across 4-wire dedicated circuits.

2.3.4.2.2 Router. A router provides the interface to transfer the data between the dedicated modem and the OPUP server. The router has one auto-sensing 10/100 Ethernet port, two dedicated ports, and an eight-port dial module.

2.3.4.3 Local Area Network (LAN) Smart Switch. The LAN switch provides for inter-processor communication for OPUP components in the OPUP. The switch acts as the OPUP traffic cop by directing all inter-component messages and commands to the appropriate destination.

2.3.4.4 CD-R/W. Archive IV data are recorded to CD-ROM media using a CD-R/W drive. Additionally, this device is used to locally store adaptation data.

2.3.4.5 Color Printer. A network-capable, postscript color printer is part of the standard configuration for most sites, but is optional at some. If a printer is connected, it must be installed via the OPUP Manager function.

2.3.4.6 Uninterruptible Power Supply (UPS). An UPS provides uninterrupted AC power for the Small OPUP equipment, except the printer and secondary monitor, if installed. The UPS comes with Powerchute software which supports automatic shutdown and also allows the user to monitor the UPS performance.

2.3.4.7 Color Monitor. The stand-alone OPUP includes a dedicated 21-inch color monitor for product data display and for system maintenance and administration.

2.3.5 Keyboard.

The OPUP human-computer interface is designed to allow the vast majority of operator inputs via mouse selections from the GUI. However, a keyboard is required for the entry of user logins, adaptation data, Routine Product Set (RPS) lists names, etc.

2.3.5.1 Keyboard Usage. The alphanumeric keyboard has a number of different types of keys used to enter and/or manipulate alphanumeric data on the GUI. These key types are described in the following sections.

Certain keys, as noted below, have an auto repeat feature. When a character is depressed for at least one second, the terminal generates a stream of that character at a rate of 15 characters per second until the key is released.

2.3.5.2 Alphanumeric Keys. When the cursor is positioned within an unprotected field, depression of an alphanumeric key will cause the corresponding character to replace any character currently at that location. The cursor will then be automatically repositioned at the next unprotected character on the screen. In order to transfer over to the next subfield, one has to either tab over or use the mouse and click in the new desired subfield. On the keyboard, the numeric keys each contain two symbols. The lower symbol is the character displayed by simply depressing the key. The upper symbol is the character displayed by depressing the key in conjunction with either one of the two **<Shift>** keys. To facilitate the typing of a string of uppercase characters, use the **<Caps Lock>** key.

2.3.5.3 Space Bar. While the alphanumeric keys operate in a manner very similar to a typewriter, the **<Space>** Bar is an important exception. The **<Space>** Bar actually produces a blank character which replaces whatever is currently at the cursor location. Therefore, the mouse or the cursor control keys must be used to nondestructively skip over screen data. In addition, when using the tab key to move from one unprotected subfield to another, pressing the **<Space>** Bar will activate the newly selected subfield. The **<Space>** Bar has the auto repeat feature.

2.3.5.4 Return Key. The **<Return>** key causes the character string currently displayed on the screen to be processed. Prior to depressing the **<Return>** key, the operator can use the alphanumeric keys, editing keys, the numeric keypad, and certain auxiliary operation keys to enter/alter

characters in the unprotected areas of the screen in order to format the command or data. Upon completion of such enter/alter operations, depressing the **<Return>** key causes the data on the screen to be interpreted.

2.3.5.5 Cursor Control Keys. Certain keys facilitate the movement of the cursor without intervention of the GUI software, and without altering the contents of the alphanumeric screen. These cursor control keys include the arrow keys, **<Tab>**, **<Home>**, **<Page Up>**, **<Page Down>**, and **<Back Space>**. All cursor control keys except for **<Home>** have the auto repeat feature.

2.3.5.6 Cursor Movement Keys. The cursor movement portion of the keyboard consists of the **<Home>** key and eight keys labeled with arrows for each 45 degree direction of a full 360 degree circle. The eight keys hereinafter are referred to as Arrow keys.

NOTE

The **<Arrow>** keys move the cursor throughout the various unprotected areas of the screen, but not always in the expected direction. Depending upon the arrangement of the unprotected areas, there may not be any vertical movement of the cursor, even though the vertical movement arrow keys are depressed.

2.3.5.7 Tab Key. The **<Tab>** key can be operated with or without the **<Shift>** key. When the **<Tab>** key is depressed unshifted, the cursor moves to the next unprotected area of the screen. This is normally in a horizontal direction until no more unprotected areas remain on that line. Then the cursor is moved to the first unprotected area of the next line down.

NOTE

When entering data in two columns, the cursor shifts from column to column and then down a line, not down one column in a numerically logical sequence. If there are no unprotected areas between the current cursor location and the end of the screen, the cursor is moved to the first position of the first unprotected area on the screen. When the **<Tab>** key is depressed in conjunction with the **<Shift>** key, the cursor moves to the first position of the previous unprotected field. If the cursor is currently in the first position of the first unprotected field, it goes to the last position of the last unprotected field on that screen.

2.3.5.8 Home Key. The **<Home>** key moves the cursor to the left-most position of the first unprotected area of the screen. However, it does not function on many of the GUI screens.

2.3.5.9 Page Up/Page Down Keys. The **<Page Up>/<Page Down>** keys function when there are multiple pages of information on the screen. One complete page at a time is scrolled forward for **<Page Up>** or backwards for **<Page Down>**. If there is just one page of information, then the **<Page Up>/<Page Down>** keys do not function.

2.3.5.10 Back Space Key. The **<Back Space>** key moves the cursor one space at a time to the left, deleting any alphanumeric entry that may have existed in each space.

2.3.5.11 Insert Key. The **<Insert>** key is a toggle. When toggled on, the **<Insert>** key allows the data to be entered without overwriting the existing information. When toggled off, any keystroke writes over the existing information and advances to the next location without advancing the existing information.

2.3.5.12 Delete Key. The **<Delete>** key is used to delete the alphanumeric character on which the cursor is blinking in any unprotected field. If the operator wants to delete a series of alphanumeric characters, then using the mouse click, drag, and highlight the characters desired, and then press the **<Delete>** key. The **<Delete>** key has the auto repeat feature.

2.3.5.13 Numeric Keypad. The numeric keypad is located in the lower right portion of the keyboard and consists of the **<Enter>** key and a full set of numeric keys, including a minus sign, a plus sign, an asterisk sign, a back slash symbol, a decimal, a **<Delete>** key, an **<Insert>** key, a **<Home>** key, an **<End>** key, **<Page Up>** and **<Page Down>** keys, four **<Arrow>** keys, and a **<Number Lock>** key. This keypad is provided to facilitate numeric data entry for people who are proficient at operating adding machines. The number keys on this keypad operate the same as the unshifted number keys at the top of the alphanumeric keyboard. The decimal, plus, minus, asterisk, and back slash keys all operate the same as the regular entries from the alphanumeric keyboard. The **<Home>**, **<End>**, **<Page Up>**, **<Page Down>**, **<Delete>**, **<Insert>**, and four **<Arrow>** keys all require the **<Shift>** key be depressed at the same time in order for these functions to work. The **<Number Lock>** key acts as a toggle switch. When the **<Number Lock>** is engaged, just the numbers and the decimal, plus, minus, asterisk, and back slash keys function. When the **<Number Lock>** is not engaged, then just the other functions work. The state of the **<Number Lock>** key is indicated by the **<Num Lock>** indicator at the upper right portion of the keyboard. When the light is on, the <**Number Lock>** is engaged. When the light is off, the **<Number Lock>** is not engaged. All keys on the numeric keypad have the auto repeat feature.

2.3.5.14 Shift Keys. There are two **<Shift>** keys, one on either side of the alphanumeric keyboard. These keys do nothing when used alone, but are used in conjunction with other keys to increase the number of actions which a single key can perform. The two **<Shift>** keys operate identically. The effect of using **<Shift>** in conjunction with any given key is described in the section pertaining to the particular key.

2.3.6 Three Button Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names are normally shown with a unique font (e.g., *variable_name*). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all portions of the command that are entered

exactly as shown are in bold type. The variable placeholder within the command string must be replaced with a name, address, etc. unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner:

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

Section 2.4. LOG-IN AND USER ACCOUNTS

2.4.1 Introduction.

Access to the OPUP operating system software and operational applications is restricted to authorized users. To enforce this restriction, each user is assigned a unique account with a user name and password.

2.4.2 OPUP Manager Login.

The OPUP Manager GUI is accessed via the special `OPUP Manager login` *account name* and *password*. Access to this GUI and its functions is restricted to only a few selected individuals.

The OPUP Manager account has unrestricted access to the operating system software, to include command line access. The OPUP Manager login also initiates the OPUP Manager Main Menu GUI which interacts with the applications software and OS scripts. This GUI manages housekeeping and maintenance scripts which include executing the start and stop scripts, server control, adaptation data storage and Archive data set restoral. Additionally, user account definitions are controlled via this GUI. Reference NWS EHB 6-537 (Large/Medium OPUP Configurations) or NWS EHB 6-538 (Small OPUP Configurations) for complete OPUP Manager operating instructions.

2.4.3 User Login.

Each authorized user is assigned a unique user account and password. User accounts cannot launch the OPUP Manager GUI and do not have command line access.

Upon successful login, a special user CDE is launched that provides access to the OPUP application software launch buttons. Additionally, the specific user profile is accessed to automatically customize the session according to that user's preferences.

2.4.4 OPUP Workstation.

All three OPUP configurations include a dedicated OPUP display workstation. This display is connected directly to the OPUP processor (server) and is used solely for OPUP applications. In this environment, Solaris (UNIX) prompts the user for a user name and password, and upon successful login, displays the OPUP CDE screen appropriate for the defined user account.

Section 2.5. OPERATING SYSTEM OPERATOR INTERACTION

2.5.1 Introduction.

The OPUP processors use the UNIX operating system. One advantage of UNIX is its ability to perform multi-task processing, which enables the OPUP system to perform a variety of tasks simultaneously. User interaction with UNIX is done through the Common Desktop Environment (CDE) GUI.

2.5.1.1 Common Desktop Environment (CDE). The CDE is designed to make using UNIX easier for users. CDE is automatically started as part of a normal boot process and is configured to run in a multi-user, networked environment. To help the user organize and manage work, CDE provides windows, workspaces, and the Front Panel.

2.5.1.1.1 Windows. Windows contain software applications and are framed with controls that allow the user to move them, re-size them, or place them in other workspaces.

2.5.1.1.2 Workspaces. Workspaces are the areas of the screen where the user places the windows that are needed for work. There are four available workspaces, denoted in Figure 2-4 as One, Two, Three, and Four, respectively. Any OPUP application may be displayed in any workspace.

It should be noted that even though there are four independent workspaces, only one instance of each OPUP application is allowed per user login. In other words, if the Product Display GUI is active in Workspace One, you cannot launch another instance of the Product Display GUI application in Workspace Three.

2.5.1.1.3 Front Panel. The Front Panel is the horizontal window located at the bottom of the display in every workspace. It is a collection of controls that each represent a frequently used application. All operator interaction with the OPUP operating system is performed through icon selections from the OPUP Workstation Front Panel (Figure 2-4). Icons are provided on the Front Panel to launch and start the four parent OPUP applications (Product Display, Status & Control, Archive Product Display, and Archive Status Log). Icons are also provided to launch the Power Management and Screen Saver/Lock GUIs.

Figure 2-4. OPUP Workstation Front Panel

NOTE:

OPUP Administration and Management interactions are described in NWS EHB 6-537 (Large/Medium OPUP Configurations) and NWS EHB 6-538 (Small OPUP Configurations).

The OPUP Workstation Front Panel contains the controls listed below. The following terms are used to describe the functions of the Front Panel controls:

Indicator: What the image of the control represents.

Click: What happens when the control is single-clicked with the left mouse button.

Workspace Switch

Indicator: Currently selected workspace.

Click: Displays other workspaces or allows the user to rename the current workspace.

Digital Clock

Indicator: Current OPUP server system time.

Click: No response.

Electronic Performance Support System (EPSS)

Indicator: EPSS application.

Click: Loads and Starts the EPSS. This application provides the user with Just-In-Time, interactive step-by-step instructions on performing a selected task.

Product Display

Indicator: Product Display GUI application.

Click: Loads and Starts the Product Display GUI.

Status & Control

Indicator: Status and Control GUI application.

Click: Loads and starts the Status and Control GUI.

Archive Product Display

Indicator: Archive Product Display GUI application.

Click: Loads and starts the Archive Product Display GUI.

This GUI *ONLY* displays products from the Archive database.

Archive Status Log

Indicator: Archive Status Log GUI application.

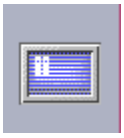
Click: Loads and starts the Archive Status Log GUI.

This GUI *ONLY* displays status log information retrieved from the Archive database.

Desktop Power Management

Indicator: Workstation power management GUI.

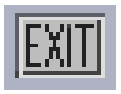
Click: Launches a GUI that enables the user to configure the power management features of a workstation.



Desktop Style Screen Manager

Indicator: Screen saver and screen lock GUI.

Click: Launches a GUI that enables the user to modify their screen saver and screen lock configuration.



EXIT

Indicator: Exit.

Click: Terminates the current log-in session and exits the common desktop environment.

Section 2.6. BACKGROUND PROCESSES

2.6.1 Introduction.

Several OPUP processes run in the background to perform basic service functions like communications and data base administration.

2.6.2 Background Processes.

These processes, although not initiated or managed by the operator, are vital to the operation of OPUP. The following paragraphs provide a brief description of these background processes.

2.6.2.1 Dial Message Control Unit. The Dial Message Control Unit (dmcu) handles the dial-out traffic between the OPUP and the RPG. A separate instance of the dmcu is required for each dial connection request. Each instance of dmcu is independent from the other instances and may be started or terminated without affecting any other instance of dmcu.

The dmcu will send the product request to the RPG upon establishing a valid connection. Products received from the RPG are stored in linear buffers. When products are received, an event notification is broadcast across the system with a message containing the product description header.

2.6.2.2 Message Control Unit. The Message Control Unit (mcu) handles the NEXRAD format message traffic between the OPUP and the RPG. A separate instance of the mcu is required for each connection to an RPG. Each instance of mcu is independent from the other instances and may be started or terminated without affecting any other instance of mcu.

The mcu will send the current/last RPS list upon connection to the RPG. The mcu retrieves the appropriate RPS list for the specified connection contained in the database. If the operational mode of the radar has changed, the mcu will send the default RPS list for the current operational mode.

The message code of each RPG message is determined by the mcu and dealt with accordingly. Messages received from the RPG include general status, alert adaptation parameter, request response, and PUP status request messages. Received messages are written to the appropriate linear buffers on the OPUP system as determined by the configuration file. An event is posted, as needed, with the receipt of each message as needed.

Products received from the RPG are also stored in linear buffers. When products are received, an event notification is broadcast across the system with a message containing the product description header.

The mcu also responds to events from other OPUP applications or users that are requesting to send a message to the RPG. These events include user requests to send an RPS list, a one-time product request, or an alert request.

2.6.2.3 Purge Database. Products received from any RPG, in response to either a routine or one-time product request, are stored in the OPUP data base for later display via the Product Display GUI. The data base is sized to hold each product for six hours. The OPUP employs a purge database housekeeping tool that automatically purges the data base of all products that are older than six hours. This tool helps restrict the number of products stored and therefore helps bolster rapid database queries in support of operator product display requests. Additionally, limiting the age of the stored products ensures the database is maintained at a manageable size.

2.6.2.4 Alert Server. The Alert Server process monitors the network event traffic and traps any event messages that contain alerts. The alert information is then updated in the "alertdb" database.

2.6.2.5 Terminator Server(s). The Terminator Server processes execute the appropriate shutdown (and restart) functions to ensure orderly termination (and initiation) of the OPUP Application software.

2.6.2.6 Product Server. The Product Server process monitors the network event traffic and traps any event messages that contain product information. The Product Server updates the "productdb" database with the product description information.

2.6.2.7 One-Time Request (OTR) Server. The One-Time Request Server (otrserver) tracks, inventories, and accounts for all one-time requests initiated by the OPUP.

2.6.2.8 Communication Manager TCP. The Communication Manager TCP (cm_tcp) processes the TCP/IP message traffic between the RPG and OPUP. A separate instance of the cm_tcp process is required for each set of eight dedicated communication lines. Additionally, a separate instance of cm_tcp is required to support dial-out communications.

2.6.2.9 Remote System Services Daemon Threaded. The Remote System Services Daemon Threaded (rssdt) provides access to remote services that may reside on another server or workstation. The rssdt service also provides the mechanism for OPUP applications to communicate with each other using an event notification method.

2.6.2.10 Purge Distribution Product. The OPUP is designed to transfer products to external systems. If a problem arises that results in the inability to transfer all designated products to an external system, the Purge Distribution Product (PurgeDistProduct) function deletes outdated products from the distribution queue.

2.6.2.11 File Transfer Protocol (FTP) Server. The FTPServer manages the transfer of products to the designated external system(s).

2.6.2.12 National Imagery Transfer Format (NITF) Server. The NITFServer process reformats the native NEXRAD format products into NITF for distribution to an external data server. To distribute the processing load, two instances of this process are active.

2.6.2.13 NEXRAD Product Server. The NEXRADProductServer processes the native NEXRAD format products for distribution to an external data server.

2.6.2.14 Portable Network Graphics (PNG) Server. The PNGServer process reformats the native NEXRAD format products into PNG format for distribution to an external data server. To distribute the processing load, two instances of this process are active.

CHAPTER 3
OPUP PRODUCT REQUEST GUI

Section 3.1. INTRODUCTION

3.1.1 General.

This chapter provides specific OPUP product request functionality explanations and detailed procedures for product acquisition using the Product Request GUI.

3.1.2 Chapter Organization.

Chapter 3 is organized into five sections as follows:

- Section 3.1. INTRODUCTION - Provides a brief description of each section found in Chapter 3.
- Section 3.2. PRODUCT REQUEST GUI INTERACTION - Provides a brief overview of the operator interaction with the OPUP GUI.
- Section 3.3. PRODUCT REQUESTS - Provides background information on Routine Product Requests and One-Time Requests.
- Section 3.4. PRODUCT REQUEST GUI INTERFACE - Provides an overview of the Product Request GUI interface
- Section 3.5. PRODUCT REQUEST INTERFACE - Provides step-by-step instructions defining the process of product request set definition and control.

Section 3.2. PRODUCT REQUEST GUI INTERACTION

3.2.1 Introduction.

The OPUP Product Request GUI design is based on a familiar window-like graphical user interface that is used throughout the computer world.

3.2.2 Graphical Icons.

Graphical icons are used extensively throughout the OPUP Applications Graphical User Interface design to execute commands and functions. Icons that are not valid selections, due to the current active process or the user access level, are de-sensitized (greyed-out in appearance).

3.2.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all command portions that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with a name, address, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

Section 3.3. PRODUCT REQUESTS

3.3.1 Introduction.

The OPUP Product Request (PR) Graphical User Interface (GUI) provides for Routine Product Set (RPS) list definition and control, as well as One-Time Request (OTR) message definitions for associated and non-associated RPGs.

3.3.1.1 Routine Products Set (RPS) Lists. An RPS list is a list of product types and associated parameters, except date and time, which tell the associated Radar Product Generator (RPG) which specific products to generate and send routinely over the dedicated RPG-to-OPUP communications line. An RPS list may contain up to 50 separate product definitions. The OPUP will support up to 50 independent RPS list definitions. Each RPS list must have a unique name, although there is no such restriction on its contents. The RPS list name can be any letter or letter/number combination. However, to ensure a particular default RPS list is defined for Weather Modes A and B, an RPS list must be named storm and clear, respectively.

3.3.1.1.1 Current RPS List. Each dedicated RPG has a currently active Routine Product Set list which is available for viewing and editing. Keep in mind that this current list is volatile because, whenever the associated radar changes Operational (weather) Mode this list is replaced with the appropriate RPS List for that mode (e.g., storm, clear, etc.). For this reason, it is recommended that only short-term changes be made to the current list. All changes that are required for long-term use must be made to a Canned Request Set.

The current list will remain in effect through temporary communications outages (the line is disconnected, and then reconnected) as long as the Operational (weather) Mode did not change during the communications outage.

NOTE

> Editing of the currently active RPS List is available for temporary list modifications only needed until the operational mode changes.

3.3.1.1.2 Canned RPS Lists. To support the ever-changing radar support data requirements, the OPUP supports the predefinition and storage of up to 50 Canned Request Sets. These permanently stored lists are not active but may be sent (a copy is processed as current) to any RPG when the situation warrants. When a Canned Request Set is sent (copied) to an RPG, the old current list is eliminated, including any modifications which may have been made to it.

3.3.1.1.3 Default RPS Lists. The OPUP requires two default RPS lists, one name storm and one named clear, be defined and stored as Canned Request Sets. By default, these RPS lists are automatically invoked with a weather mode change. For example, when detected precipitation triggers an automatic switch from Clear-Air Mode to Precipitation Mode, the storm RPS list is sent to the RPG. This is to ensure representative data are requested and routinely available after a weather mode change.

NOTE

The RPS lists named storm and clear may be modified but they may not be deleted.

3.3.1.1.4 RPG-Specific RPS List. The OPUP also allows the definition of RPG-specific storm and clear RPS lists. These RPG-specific storm and clear RPS lists are automatically invoked at the specific RPG when the weather mode for that particular radar changes. RPG-specific RPS lists are identified by the naming convention - RPGID_storm. For example, CMAR_storm is the storm RPS list for the CMAR RPG. Therefore, each time the CMAR radar switches from Clear-Air Mode to Precipitation Mode, the CMAR_storm RPS list will be sent to the CMAR RPG.

NOTE

If there is not a defined RPG-specific storm and clear RPS list for a particular radar, then the OPUP will automatically send the default storm or clear RPS list to that RPG upon weather mode change.

When the weather mode changes for a particular RPG the OPUP searches the Canned Requests Sets list for an RPG-specific RPS list for that RPG and weather mode. If an RPS list is found for that weather mode and RPG (e.g., CMAR_storm) it is sent (copied) to the RPG. If an RPG-specific RPS list is not found then the default RPS list for that weather mode (e.g., storm) is sent.

3.3.1.2 One Time Request. Any request for a product or set of products outside of the RPS list is termed a one-time request (OTR). All product requests to non-associated RPGs, as well as all product requests to the associated RPG over the dial-up line, are also one-time product requests. In addition, OTRs can be made to the associated RPG over the dedicated line. The purpose of an OTR over the dedicated RPG circuit is to supplement the routine product set routinely received from that RPG.

NOTE

It is significantly easier to issue an OTR for a set of products or to issue OTRs to multiple RPGs using the Product Request GUI interface (Refer to Section 3.4 and paragraph 3.5.3). However, to issue an OTR for a single product or a customized product (e.g., SRR, SWA, etc.), the OTR feature on the Product Display GUI (see paragraph 4.4.2) is superior.

NOTE

The Clutter Filter Control (CFC) products should only be requested via OTR. CFC products are not routinely generated by the RPG, they are only generated when there has been a change in the clutter suppression scheme or a CFC product

is requested by a user and is not available in the RPG data base. Since these products are not routinely generated by the RPG, it does not make sense to have CFC products on the RPS list. If CFC products are included on an RPS list, the RPG will only transmit the products during the volume scan in which they were generated.

A single one-time product request may actually be for up to nine sequential volume scan versions if the request is to an associated RPG over a dedicated communication line. For any dial-up line, the request is valid only for a single volume scan version. In this case, once the request is honored, assuming no additional requests are made to the same RPG while the line is connected, the OPUP will automatically disconnect the line when receipt of that product is complete.

For dial-up line connections, these connections and disconnections are all performed automatically. There is a table of RPG phone numbers in adaptation data which are automatically used based on the RPG indicated in the request.

If time and date fields are left blank for an OTR, the most current product version with the specified parameters will be requested from the RPG.

Older versions of a product, as long as they are still available in the RPG's database, may be obtained by entering the desired date and time.

Once a product is received and stored in the OPUP data base, it is available for display in the same manner whether it was obtained from a one-time request or from a Routine Product Set request.

Use the Time and Date parameters in one-time RPG requests as follows:

A. Time and date parameters NOT SPECIFIED (blank):

For volume scan products:

The product is generated from the previous or next volume scan, depending on the capability designed into the RPG for the product type.

For elevation based products:

If the elevation angle requested is at or below the current elevation angle being scanned, then the product is generated from the current volume scan.

If the elevation angle requested has not yet been reached, then the product is generated from the previous volume scan (i.e., produced by the RPG from base data stored on its disk and replayed).

B. Time and date parameters SPECIFIED:

The RPG searches its data base for a product that satisfies all applicable product parameters for a time window within 15 minutes of the specified time and date. If found, the product is sent, otherwise a PROD NOT GEN (product not generated) message is returned to the OPUP. Note that if the time specified is within the RPG’s current volume

scan and the product has not yet been generated, a PROD NOT GEN message will also be returned in this case.

Both graphic and alphanumeric products may be requested from any non-associated RPG whose identification number, mnemonic, and telephone number are listed in the OPUP's adaptation data (refer to NWS EHB 6-537 (Large/Medium OPUP Configurations) and NWS EHB 6-538 (Small OPUP Configurations) for additional information). Assuming a dial-up communication line is enabled, the operator only has to select the appropriate RPG ID and send the request; the OPUP does everything else. First, it waits for the dial-out communications line to become free. Once it is, the OPUP looks up the telephone number, dials the number, waits for the RPG to answer, sends the request, waits for the response (the product or a product not available message), files the product into the OPUP data base (if received), notifies the operator of the response (see Section 6.5), and disconnects the line. If the RPG does not answer, the OPUP automatically retries the request ten more times before giving up.

Products received from any RPG, in response to either a routine or one-time product request, are stored in the OPUP data base for later display via the Product Display GUI. The database is sized to hold each product for six hours. The OPUP employs a database housekeeping tool that automatically purges the data base of all products that are older than six hours. This tool helps restrict the number of products stored and therefore helps bolster rapid database queries in support of operator product display request. Additionally, limiting the age of the stored products ensures the database is maintained at a manageable size.

Section 3.4. PRODUCT REQUEST GUI INTERFACE

3.4.1 Introduction.

The Product Request GUI provides for the creation, management, and control of product requests to all available RPGs. The Product Request GUI supports Routine Product Set lists, One-Time Request (OTR) Sets, and individual one-time requests. Although any operator using the OPUP can create and send one-time requests and can view the current RPS lists and all canned request sets, access to some functions (e.g., sending an RPS list, renaming a canned set, etc.) are limited by access level and password.

3.4.2 Launching the Product Request GUI.

The Product Request GUI is a main function of the OPUP operational software suite. To activate the Product Request GUI, from the OPUP workstation, click on the **Product Request** button on the Status and Control GUI Launch Bar (see Section 6.3). This action loads and starts a new, independent, instance of the Product Request GUI software for this workstation. The access to view the information provided by this GUI is not restricted; however, editing of product request sets, modification of canned sets, and sending RPS list sets are restricted by access level and password.

3.4.3 Product Request GUI Overview.

Product requests are defined, modified, managed, and transmitted to the selected RPG using the Product Request GUI. The OPUP provides for defining and saving product request sets for future use. These stored sets, known as Canned Request Sets, may define a single product or a list of up to 50 products. Canned sets may either be invoked as Routine Product Sets or sent to selected RPGs as One-Time Requests. Care should be taken when naming individual sets to ensure the operator can differentiate between those sets designed for use as RPS lists and those sets designed as OTR lists.

The Product Request (PR) GUI (Figure 3-1) is divided into four distinct windows. Each window passes data to the adjacent window(s) as indicated by the blue data flow arrows.

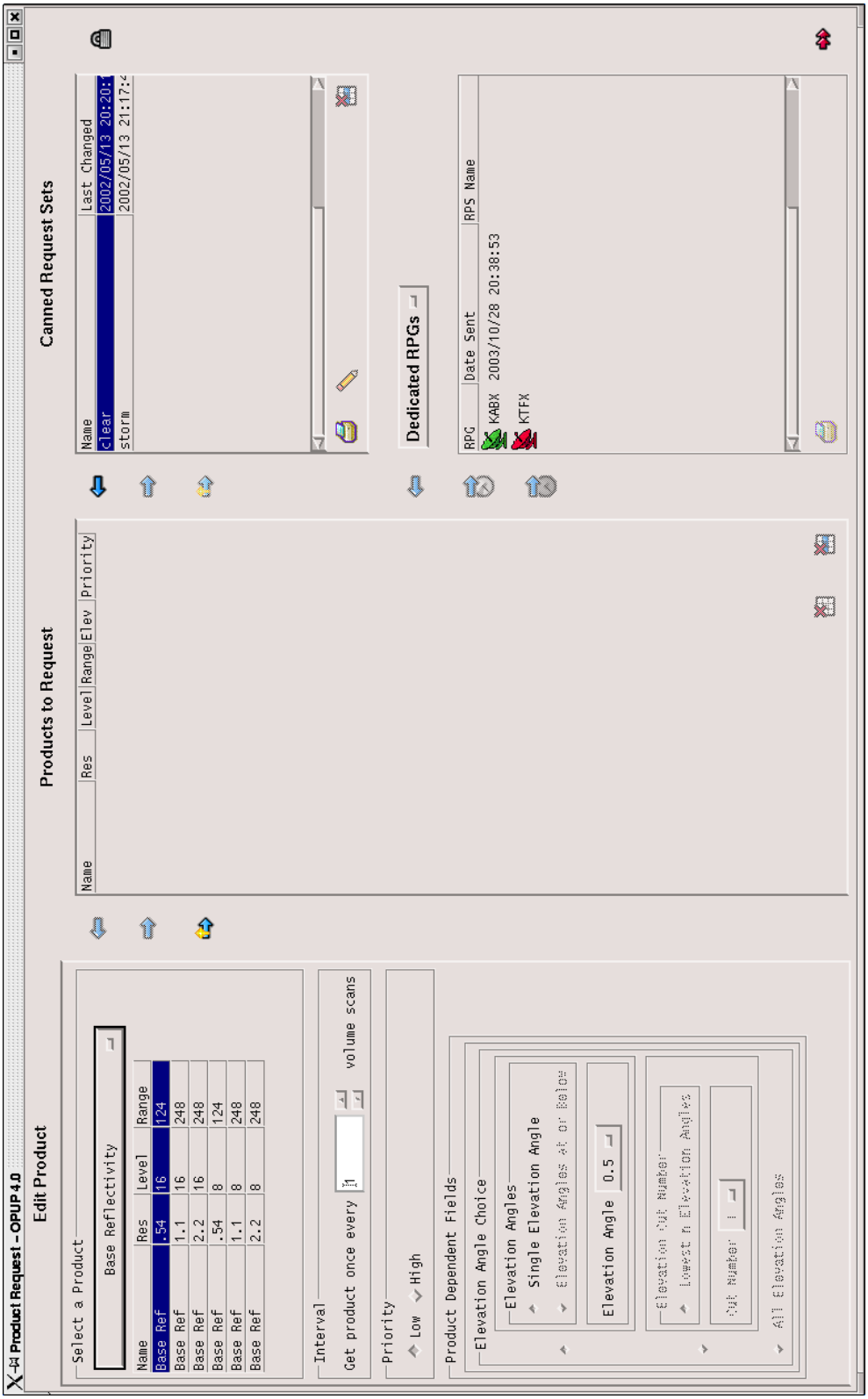


Figure 3-1. Product Request GUI

3.4.3.1 Edit Product Window. The Edit Product window allows the operator to specify individual unique product definitions for inclusion in a product request set. The specific window functions include product type selection, distribution interval selection, distribution priority selection, and product dependent fields definition.

3.4.3.1.1 Select a Product. Individual WSR-88D products are characterized by product type (e.g., reflectivity, velocity, etc.), data level (viz., 8 or 16), and data resolution (e.g., .13 nm, 2.2 nm, etc.). The Select-a-Product portion of the PR GUI provides a listing of all WSR-88D product types. When a specific type is selected, the operator is presented the valid data level and resolution options to identify the unique WSR-88D product.

NOTE

The Range parameter is tied directly to the data resolution for a particular product. In the PR GUI, the product's display range (Range) is provided for information only and is not an editable selection.

3.4.3.1.2 Interval. The Interval parameter indicates how often the product is to be sent. If it is set to 1, the product is to be sent every volume scan (this is the default). If it is set to 2, the product is to be sent every other volume scan, etc., up to 9 for every ninth volume scan. This also determines the frequency of products available for building future time lapse loops since a frame that is not present obviously cannot be put in a time lapse.

3.4.3.1.3 Priority. The Priority selection allows the operator to select the RPG-to-OPUP transmission priority of the individual product. The priority selection (High or Low) dictates which products rise to the top of the queue when more than one product is waiting for transmission. If all waiting products have the same transmission priority, then the products are transmitted using the first in, first out scheme.

3.4.3.1.4 Product Dependent Fields. In addition to the general product characteristics of product type, data level and resolution, many WSR-88D products require additional parameters (e.g., elevation angle, storm speed/direction, etc.) to define them as unique products. See Table 3-1, for a complete list of available products and attendant parameters. The Product Dependent Fields section of the Edit Product window allows the operator to specify these parameters to ensure the exact product is generated by the RPG.

When a product type that allows additional product dependent parameters is selected in the Select-a-Product section, the Product Dependent Fields section updates to present the operator with the valid selections pertaining to that product. The Product Dependent Fields are:

- `Elevation Angle -` Defines the specific elevation angle or slice to derive the product, or all elevation products at and below a specified elevation angle, the lowest "n" elevations, or all elevation angles.
- `Storm Speed -` Along with Storm Direction, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Storm Direction -` Along with Storm Speed, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Azimuth -` Defines the azimuth angle (from the RDA) and is used in conjunction with Range to define a location for a product center or end point.
- `Range -` Defines the range (from the RDA) and is used in conjunction with Azimuth to define a location for a product center or end point.
- `Altitude -` Defines the altitude MSL for Velocity Azimuth Display product definition.
- `Start Time -` Defines the starting hour and is used in conjunction with Duration to define the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Duration -` Used in conjunction with Start Time, defines the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Elevation Cut -` Defines the elevation angles included in the Weak Echo Region (WER) product definition.
- `Lowest Map -` Specifies Elevation Segment 1 for the Clutter Filter Control product definition. Elevation Segment 1 includes all elevation angles below 2 degrees.
- `Upper Map -` Specifies Elevation Segment 2 for the Clutter Filter Control product definition. Elevation Segment 2 includes all elevation angles at 2 degrees and above.
- `Surveillance -` Specifies the Surveillance Channel for the Clutter Filter Control product definition.
- `Doppler -` Specifies the Doppler Channel for the Clutter Filter Control product definition.

Table 3-1. WSR-88D Products

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
BASE REFLECTIVITY (R) A display of echo intensity measured in dBZ. The Base Reflectivity product is primarily used to locate and track storms, analyze storm structure, identify severe weather signatures, locate boundaries, and estimate rainfall intensity.	16	8	.54	124	0.5-19.5	None
	17	8	1.1	248	0.5-19.5	
	18	8	2.2	248	0.5-19.5	
	19	16	.54	124	0.5-19.5	
	20	16	1.1	248	0.5-19.5	
	21	16	2.2	248	0.5-19.5	
BASE SPECTRUM WIDTH (SW) A measure of the variability of motions within the sample. The Base Spectrum Width product is used to evaluate the validity of the base velocity estimates, locate boundaries, and as an early indication of the development of convection.	28	8	.13	32	0.5-19.5	None
	29	8	.27	62	0.5-19.5	
	30	8	.54	124	0.5-19.5	
BASE VELOCITY (MEAN RADIAL) (V) A measure of the radial component of the wind either toward or away from the radar. The .54-nm Base Velocity product displays the first velocity value of every four 250-meter range gates. The .27-nm Base Velocity product displays the first velocity value of every two 250-meter range gates. While the .13-nm Base Velocity product displays every available 250-meter range gate. The Base Velocity product is used primarily to estimate wind speed and direction, identify and quantify severe weather signatures, analyze atmospheric structure, and locate boundaries.	22	8	.13	32	0.5-19.5	None
	23	8	.27	62	0.5-19.5	
	24	8	.54	124	0.5-19.5	
	25	16	.13	32	0.5-19.5	
	26	16	.27	62	0.5-19.5	
	27	16	.54	124	0.5-19.5	

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
USER SELECTABLE PRECIPITATION ACCUMULATION (USP) The USP product displays the total precipitation for a user specified end hour and duration. By default, daily generation will occur at 12Z for a duration of 24 hours. The USP may be generated by One-Time Request (OTR), or can be placed on the Routine Product Set (RPS) list to be generated every volume scan. The USP is generated from the 30 hour database of hourly accumulations ending at the top of the hour. The time period is specified by entering a duration (up to 24 hours), and the end hour (0-23) which must be within 23 hours of the current time. If a duration is specified, but the end hour is left blank, then a USP is generated for the specified time period ending at the top of the current hour.	31	16	1.1	124	Uses Hybrid scan	End Hour and Duration

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
HYBRID SCAN REFLECTIVITY (HSR) The Hybrid Scan Reflectivity product is a display of the reflectivity values used in the conversion from reflectivity to rainfall rate (Hybrid Scan). Reflectivity for each azimuth and range is obtained from one of the four lowest tilts. In addition, the data has undergone a series of quality control steps, including corrections for beam blockage, spurious noise, outliers, ground returns, and for the change in beam altitude with range. All precipitation products are derived from the information found in the HSR product.	33	16	.54	124	Result of the Hybrid Scan data processing from the lowest 4 elevation angles	None
CLUTTER FILTER CONTROL (CFC) A special graphical product which provides visual information about all pertinent details regarding clutter suppression. Four products are available for generation, each dependent upon the Doppler or Surveillance Channel and the elevation segment number, (1 or 2). Elevation segment 1 is for the lowest 2 elevations and segment 2 is for all elevations above 2°. The CFC product is generated when the clutter suppression definition changes or to honor a one-time request.	34	8	.54	124	Segment 1 or 2	Channel S = Surveillance D = Doppler

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
COMPOSITE REFLECTIVITY (CR) A display of the maximum reflectivity value above each geographic grid point, overlaid with a table of storm attributes. The Composite Reflectivity product is a quick way to see the maximum storm reflectivity without having to search through the various elevation angles.	35	8	.54	124	Uses all elevation angles to build product	None
	36	8	2.2	248		
	37	16	.54	124		
	38	16	2.2	248		
ECHO TOPS (ET) An image of the 18-dBZ (VIP1) top heights color-coded in 5000-ft. increments. The Echo Tops product can be used to help determine storm strength and the location of storm tops for storm structure information or for pilot briefing purposes.	41	16	.54	124	Uses all elevation angles to build product	None
SEVERE WEATHER ANALYSIS REFLECTIVITY (SWR) A 27 nm by 27 nm representation of the base reflectivity data centered on an operator-defined or alert-defined point.	43	16	.54	124	0.5-19.5	Center Point (Azimuth/ Range)
SEVERE WEATHER ANALYSIS VELOCITY (SWV) A 27 nm by 27 nm representation of the base velocity data centered on an operator-defined or alert-defined point. The velocity data is displayed at .13-nm resolution (highest available from the radar) regardless of the center point range.	44	16	.13	124	0.5-19.5	Center Point (Azimuth/ Range)

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
SEVERE WEATHER ANALYSIS SPECTRUM WIDTH (SWW) A 27 nm by 27 nm representation of the base spectrum width data centered on an operator-defined or alert-defined point. The data is displayed at .13-nm resolution (highest available from the radar) regardless of the center point range.	45	8	.13	124	0.5-19.5	Center Point (Azimuth/ Range)
SEVERE WEATHER ANALYSIS RADIAL SHEAR (SWS) A 27 nm by 27 nm representation of the radial shear centered on an operator-defined or alert-defined point.	46	16	.27	124	0.5-19.5	Center Point (Azimuth/ Range)
SEVERE WEATHER PROBABILITY (SWP) An alphanumeric set of severe weather probability values displayed in a graphic map format. Product is updated each time the VIL product is updated. SWP information is available as a stand-alone product or as an overlay. The SWP number is not a true probability, but rather a measure of relative storm severity. SWP values are directly related to the horizontal extent of VIL values greater than a specified threshold.	47	4 SWP values range from 0 to 99 and are color coded (ND plus 3)	2.2	124	VIL is ONLY input	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
VELOCITY AZIMUTH DISPLAY WIND PROFILE (VWP) A graphic display of wind barbs plotted on a height scale in 1,000-foot increments. The current plot (far right) and up to 10 previous plots may be displayed simultaneously on a time versus height scale. Wind speed and direction for up to 30 altitudes are displayed as wind barbs on a height scale. All altitudes are referenced to mean sea level. Wind speed and direction are reported to the highest altitude with sufficient signal available for processing by the VAD algorithm.	48	8	N/A	N/A	Various Depends on VAD algorithm parameter, slant range, and required VWP display heights	None
REFLECTIVITY CROSS SECTION (RCS) Vertical cross section of reflectivity, generated for a user-defined vector. The Reflectivity Cross Section product is similar to the RHI of older radar technology (when one end point is at the RDA). Used to locate WERs, BWERs, and cores of high reflectivity aloft.	50	16	.54	124	Uses all elevation angles to build product	Azimuth and range for each End Point (Pt1 and Pt2)
	85	8	.54	124		

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
VELOCITY CROSS SECTION (VCS) Vertical cross section of velocity, generated for a user-defined vector. The Velocity Cross Section product is identical in form to RCS, but mean radial velocity is displayed. VCS can be used to help identify boundary layer characteristics or outflow regions, depth of shear regions, as well as storm top divergence.	51	16	.54	124		
	86	8	.54	124		
STORM RELATIVE MEAN RADIAL VELOCITY REGION (SRR) This product shows radial velocity with estimated storm motion removed. The Storm Relative Mean Radial Velocity Region (SRR) product is a 27 x 27 nm window product centered on a user-defined storm. The subtracted motion is that of the storm in question (unless otherwise specified by the OPUP operator) as determined by the storm track algorithm. The SRR product presents the air motions within a storm to balance indicated circulations in the velocity data. The SRR product displays the maximum velocity value for every two 250-m range gates.	55	16	.27	124	0.5-19.5	Center Point (Azimuth/ Range) Storm Vector (Speed/Direction)

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
STORM RELATIVE MEAN RADIAL VELOCITY MAP (SRM) The Storm Relative Mean Radial Velocity Map product is a full-scale display (124 nm) of the velocity presentation with storm motion removed. The subtracted motion is the average storm motion for all storms present (unless otherwise specified by the OPUP operator) as determined by the storm track algorithm. The SRM products present the air motions within storms to balance indicated circulations in the velocity data. The SRM product displays the maximum velocity value for every four 250-m range gates.	56	16	.54	124	0.5-19.5	Storm Vector (Speed/Direction)
VERTICALLY INTEGRATED LIQUID (VIL) The water content of a 2.2 nm by 2.2 nm column of air in kg/m^2, color-coded and plotted on a 124-nm map. Threshold VIL values for 3/4-inch hail can be approximated but will vary depending upon air mass, time of year, and freezing level, among other things. Generally, the more the VIL value exceeds the threshold, the larger the hail is likely to be.	57	16	2.2	124	Uses all elevation angles to build product	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
STORM TRACKING INFORMATION (STI) Information about the past, present, and future positions of each identified storm. Product is available in a tabular format of alphanumeric values or as a stand-alone graphic product which can be used as an overlay. The storm tracking information product is a plot of the past movement, current location, and forecast movement for the next hour (or less) for each identified thunderstorm cell.	58	N/A	N/A	186	Storm Cell Based	None
HAIL INDEX (HI) The Hail Index is designed to identify storms which have the potential to produce hail. The HI information is available as an overlay, a stand-alone product, and in tabular format. The output contains Probability of Hail (POH) estimates, the Probability of Severe Hail (POSH), and the Maximum Expected Hail Size (MEHS). The algorithm must be provided, via the UCP, with the 0 degree and -20 degree Celsius altitudes from a nearby recent sounding to be reliable.	59	N/A	N/A	124	Storm Cell Based	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
MESOCYCLONE (M) A display of information regarding the existence and nature of rotations associated with thunderstorms. The shear features are classified as: 3-D correlated shear (vertically correlated but not symmetrical), uncorrelated shear (sufficiently large but not vertically correlated), and mesocyclone (sufficiently large, vertically correlated, and symmetrical). The Mesocyclone product is available as an alphanumeric tabular display, as a graphic display, or as an overlay.	60	N/A	.13	124	Uses all elevation angles to build product	None
TORNADO VORTEX SIGNATURE (TVS) Displays information about algorithm identified Tornadic Vortex Signatures (TVS), shown as a stand-alone graphic, as an overlay, and in tabular form. The graphic product shows a TVS as a solid, red, inverted triangle, and an elevated TVS (ETVS) as an open, red, inverted triangle. An ETVS indicates strong shear was detected aloft but was not detected below 600 meters or on the lowest elevation slice. Additional output includes the base and depth of circulation, maximum shear and its altitude, and values of maximum low-level, average and maximum gate-to-gate velocity differences.	61	N/A	.13	124	Uses all elevation angles to build product	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
STORM STRUCTURE (SS) A tabular display that provides information on 6 storm attributes, some of which are maximum reflectivity and height at which it was found; cell based VIL; Storm base and top; and Storm position. The Storm Structure product contains trend information for up to 10 volume scans that the cell has existed. This is done for all cells detected in the current volume scan.	62	N/A	N/A	186	Storm Cell Based	None
LAYER COMPOSITE REFLECTIVITY AVERAGE (LRA) Composite reflectivity data projected onto a Cartesian grid for up to three layers. The Layer Composite Reflectivity Average (LRA) product displays the reflectivity average for any of three separate (low-, mid-, and high-altitude) predefined layers. The LRA products may help identify areas of extreme vertical development.	63	8	2.2	248	Low Layer	None
	64	8	2.2	248	Mid Layer	
	89	8	2.2	248	High Layer	

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
LAYER COMPOSITE REFLECTIVITY MAXIMUM (LRM) Composite reflectivity data projected onto a Cartesian grid for up to three layers. The Layer Composite Reflectivity Maximum (LRM) product displays the maximum reflectivity for each of three separate (low-, mid-, and high-altitude) predefined layers. The LRM products may help identify areas of extreme vertical development.	65	8	2.2	248	Low Layer	None
	66	8	2.2	248	Mid Layer	
	90	8	2.2	248	High Layer	
LRM AP REMOVED (APR) Composite reflectivity data projected onto a Cartesian grid for the lowest predefined layer. The maximum reflectivity for the lowest layer is shown. A clutter editor algorithm is used with this product to detect and eliminate regions of ground clutter and anomalous propagation returns. The algorithm uses velocity and spectrum width data, in addition to altitude and range information, to distinguish between meteorological returns and ground returns.	67	8	2.2	248	SFC-24,000	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
USER ALERT MESSAGE (UAM) An alphanumeric product generated by the presence of phenomena which meet or exceed predetermined alert threshold values. Location, type, and weather event severity and storm speed and direction, if appropriate, are contained in the User Alert Message.	73	N/A	-	-	-	None
ONE HOUR PRECIPITATION ACCUMULATION (OHP) The OHP product is updated each volume scan and provides an estimated precipitation accumulation during the past hour. The One-hour Precipitation Accumulation product can be used to locate flash flood or potential flood conditions in urban or rural areas, including river basins and watersheds.	78	16	1.1	124	Uses Hybrid scan	None
THREE HOUR PRECIPITATION ACCUMULATION (THP) A display of estimated precipitation accumulation for the past three hours. It updates at the top of each hour. The Three Hour Precipitation Accumulation product can be used to locate flash flood conditions in urban or rural areas, including river basins and watersheds.	79	16	1.1	124	Uses Hybrid scan	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
STORM TOTAL PRECIPITATION ACCUMULATION (STP) A display of estimated total precipitation accumulation for the storm. This accumulation total began when the precipitation detection function (PDF) initiated the accumulation algorithm processing in response to the detection of an area of precipitable return greater than the Category 2 area threshold. The Storm Total Precipitation Accumulation product can be used to locate flash flood or potential flood conditions in urban or rural areas, including river basins and watersheds.	80	16	1.1	124	Uses Hybrid scan	None
VELOCITY AZIMUTH DISPLAY (VAD) A data graph used to compute VWP. The Velocity Azimuth Display is a plot of mean radial velocity values versus azimuth angle for one specific reporting altitude along with the best-fit sine wave curve.	84	8	N/A	N/A	various	Estimate height in kft msl

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
MESOCYCLONE RAPID UPDATE (MRU) MRU product is generated once per elevation scan time to provide updated Legacy Mesocyclone Detection Algorithm Information. The Mesocyclone and 3-D Correlated shear symbols are differentiated by the thickness of their perimeters. A Meso has a thick perimeter whereas a 3-D shear has a thin perimeter. The graphic product displays the Extrapolated features of both Meso and 3-D shear as dashed yellow perimeters. Persistent, new, or increasing features are differentiated by solid yellow perimeters.	139	N/A	.13	124	0.5 - 19.5	None
TORNADO RAPID UPDATE (TRU) Displays information about the product generated by the Tornado Detection Algorithm (TDA) once per elevation scan time. TRU information is displayed as a stand-alone graphic, as an overlay, and in tabular form. The graphic product shows a TVS as a solid, red, inverted triangle for feature types of Persistent, New, or Increasing. The Extrapolated TVS is displayed as a solid, yellow, inverted triangle. Elevated TVS (ETVS) is displayed as an open, red, inverted triangle for feature type of Persistent, New, or Increasing. Its Extrapolated features are differentiated by an open, yellow, inverted triangle.	143	N/A	.13	124	0.5 - 19.5	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
ONE-HOUR SNOW WATER EQUIVALENT (OSW) This product provides radar algorithm estimated 1-hour snow water equivalent accumulation images. The product is updated every volume scan.	144	16	.54	124	Uses Hybrid Scan	None
ONE-HOUR SNOW DEPTH (OSD) This product provides radar algorithm estimated 1-hour snow depth accumulation images. The product is updated every volume scan.	145	16	.54	124	Uses Hybrid Scan	None
STORM TOTAL SNOW WATER EQUIVALENT (SSW) This product provides radar algorithm estimated storm total snow water equivalent accumulation images. The product shall be updated every volume scan.	146	16	.54	124	Uses Hybrid Scan	None
STORM TOTAL SNOW DEPTH (SSD) This product provides radar algorithm estimated storm total snow depth accumulation images. The product shall be updated every volume scan.	147	16	.54	124	Uses Hybrid Scan	None

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
USER SELECTABLE SNOW WATER EQUIVALENT (USW) This product provides radar algorithm estimated storm total snow water equivalent accumulation images for a user selected accumulation period. The product format and content is the same as the storm total snow accumulation products, except the accumulation period shall be of variable duration and in whole top-of-the-hour clock hours. The product is updated at the top of the every hour (as requested). The accumulation period is user definable via two parameters: the Ending Hour (ranging from 0 to 23Z) and the Time Span (ranging from 1 to 30 whole clock hours prior to the Ending Hour.) The product is usually generated by request, but may also be generated routinely for designated periods. The default accumulation period shall span a 24 hour period from 1200Z of the previous day to 1200Z of the present day.	150	16	.54	124	Uses Hybrid Scan	Time Span and End Hour

Table 3-1. WSR-88D Products (Continued)

PRODUCT NAME (MNEMONIC)	PROD ID	DATA LEVELS	RES (nm)	RANGE (nm)	ELEV (degrees)	Product-Specific Parameters
USER SELECTABLE SNOW DEPTH (USD) This product provides radar algorithm estimated storm total snow depth accumulation images for a user selected accumulation period. The product format and content is the same as the storm total snow accumulation products, except the accumulation period shall be of variable duration and in whole top-of-the-hour clock hours. The product is updated at the top of the every hour (as requested). The accumulation period is user definable via two parameters: the Ending Hour (ranging from 0 to 23Z) and the Time Span (ranging from 1 to 30 whole clock hours prior to the Ending Hour.) The product is usually generated by request, but may also be generated routinely for designated periods. The default accumulation period shall span a 24 hour period from 1200Z of the previous day to 1200Z of the present day.	151	16	.54	124	Uses Hybrid Scan	Time Span and End Hour

3.4.3.2 Products to Request Window. The Products to Request window displays either the product request list being edited, the current Routine Product Set (RPS) list for the selected RPG, or the contents of the selected Canned Request Set. The specific product request set presented in this window is selectable by the operator.

Product definitions from the Edit Product window are used to build and/or modify lists displayed in the Products to Request window. The interface for this window allows the operator to add new product definitions or to modify the parameters of a selected product. Additionally, the interface will not allow duplicate products to be added to a list.

The order of listed products may be changed by selecting the desired sort parameter (e.g., Name, Res, Level, etc.) in the column header. The listed order has no effect on the generation or distribution of any products; it only affects the displayed order.

Regardless of the displayed request set origin, the following information is available for each product.

3.4.3.2.1 Name. An abbreviated WSR-88D product name specifying the basic product type.

3.4.3.2.2 Res. The data resolution used to produce the specific product, if applicable.

3.4.3.2.3 Level. The number of displayable product data levels for the specific product.

3.4.3.2.4 Range. The maximum displayable product range (based on the product resolution).

3.4.3.2.5 Elev. The specific elevation angle (horizontal slice of the atmosphere) of the data collected to produce the product. The field is listed as N/A for products that require multiple elevation angles (e.g., Composite Reflectivity, etc.). If the listed elevation angle is not a valid selection for the active volume coverage pattern, the RPG will generate and send a product from the closest valid elevation angle. This field also supports requesting all elevation products at and below a specified elevation angle (identified by a "<" following the elevation angle), the lowest "n" elevations (identified by a positive integer), or all elevation angles (identified by an "*").

3.4.3.2.6 Priority. The narrowband transmission priority, either High or Low. This entry governs the relative product order within the RPG distribution queue when more than one product is waiting to be sent down the RPG-to-OPUP narrowband line.

3.4.3.3 Canned Request Sets Window. The OPUP will store up to 50 predefined product request sets. Predefined sets are listed in the Canned Request Sets window. These predefined sets may either be Routine Product Set (RPS) lists or One-Time Request (OTR) lists. The order of listed sets may be changed by selecting the desired sort parameter (viz., Name, Last Changed, or Product Count) in the column header. The listed order has no effect on the list contents, it only affects the displayed order.

Regardless of the request list type, the following information is available for each set.

3.4.3.3.1 Name. Any unique combination of letters, numbers, spaces, or characters, up to maximum of 256 characters, to describe the content or applicability of the particular product request set.

3.4.3.3.2 Last Changed. The date and time of the most recent change/modification of the product request set. If the set is new, then this date/time entry reflects the date and time the set was saved.

3.4.3.3.3 Product Count. The total number of individual product definitions contained within the product request set.

3.4.3.4 Radars Window. The radars window lists all available WSR-88Ds, according to the selected RPG-type selection, by their four letter station identifier. The contents of this window are controlled by the **RPG Selection** button (Figure 3-2). Options under this button list the radars alphabetically in three categories: Dedicated RPGs, AOR (Area of Responsibility) RPGs

(non-associated RPGs in and immediately surrounding your area of responsibility), and All (Other) Dialup RPGs.

Once the window is populated according to the selected RPG-type selection, the order of listed RPGs may be changed by selecting the desired sort order (viz., RPG, Date Sent, or RPS Name) in the column header. The listed order has no effect on the list contents, it only affects the displayed order.

This window allows the operator to identify a radar of interest. Once a radar has been identified, this window interacts with the Products to Request window to enable the operator to send a specific product request set to the selected radar. The reverse situation allows the operator to view the current RPS list from a specific radar by interacting with the Products to Request window to populate it with the product definitions for the active RPS list for that radar.

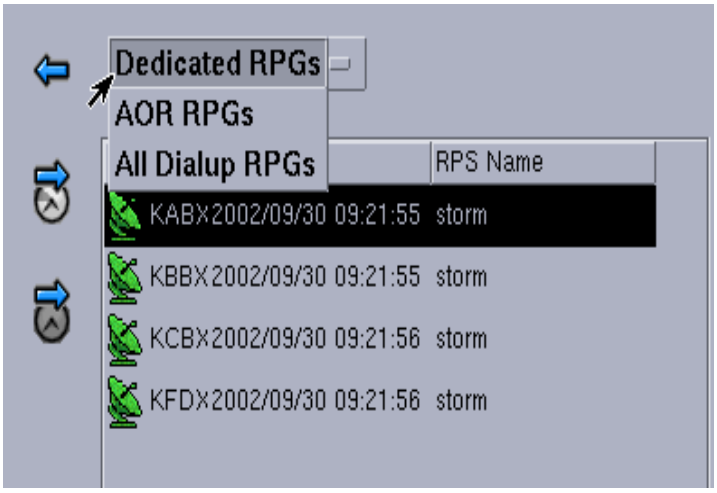


Figure 3-2. RPG Selection

The Radars window (Figure 3-2) includes the following fields:

3.4.3.4.1 RPG. A color-coded radar icon with the four letter radar site identification is listed for every WSR-88D. The radar icon color reflects the current radar state as derived from the General Status Message last received from that radar. The possible icon colors and related statuses are:

- GREEN - The OPUP-to-RPG narrowband line is connected and the OPUP is communicating with the RPG.
- GREY - The line is disconnected via command at the OPUP end.
- YELLOW - The OPUP-to-RPG narrowband line is connected; however, the RPG is reporting a loadshedding alarm and products may not be available. Additional status information should be sought via the Status GUI.
- BRIGHT RED - The OPUP-to-RPG narrowband line is connected; however, the RPG is reporting a critical failure and products are not available. Additional status information should be sought via the Status GUI.
- BRICK RED - The OPUP-to-RPG narrowband line is PENDING (not connected). This is the normal state for non-associated RPGs. However, this is not desirable for associated RPG connections and further investigation is warranted.
- PURPLE - RPG side disconnected the communications link.
- LIGHT BLUE - The OPUP is dialing a non-associated RPG in response to a one-time product request generated via either the Product Request GUI or Product Display GUI.
- BLUE - The OPUP has a dial-in connection to the RPG.
- WHITE - The message handler software task (mcu) is not responding. This is a serious communications failure and if the mcu does not recover will require an OPUP software restart to resolve.

3.4.3.4.2 Date Sent. This field provides the date and time the current RPS list was sent to the specific RPG.

3.4.3.4.3 RPS Name. This entry provides the name of the current RPS list for each associated RPG.

3.4.4 Controls and Indicators.

Operator interaction with the Product Request (PR) GUI is via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon directly under the cursor. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

3.4.4.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to either the current active process or the user access level are de-sensitized (greyed-out in appearance). A brief explanation/definition of each icon presented on the Product Request GUI is provided below

:

Left Arrow

This selection populates the window to the left with the contents (parameters) of the selected entity on the right. For example, the contents of a selected Canned Request Set will populate the Products to Request window.

Right Arrow

This selection overwrites (replaces) the selected item in the target (right) window with the new definition from the origin (left) window. In other words, the new product parameters defined in the Edit Product window will replace the product selected in the Products to Request window.

Right Arrow And Plus

This selection adds the definition contained in the left window to the right window contents. For example, the product defined with particular parameters in the Edit Product window is added to the product list in the Products to Request window.

Delete All

Deletes all current entries in the Products to Request window.

Delete One Line

Deletes the selected (highlighted) line.

Pencil

Provides the ability to name/rename a Canned Request Set.

Print

Provides the ability to print the selected Request Set. See 3.4.4.3 Print.

OTR Send

Forwards the list of products in the Products to Request window as a one-time request to the selected RPG.

RPS Send

Forwards the list of products in the Products to Request window as an RPS list to the selected RPG.

Exit

Exits the Product Request application.

Padlock

When closed, indicates access Level 0. To change access level, click the padlock icon, select the desired access level, and enter the appropriate password. The access level will remain active until it is changed or the Product Request GUI is closed, at which time the access level is reset to Level 0.

3.4.4.2 Access Levels. There are four access levels within the OPUP structure to restrict system access that may negatively impact operations.

3.4.4.2.1 No Special Access. Level 0, no special access, is the default level for all OPUP GUI screens and information. This level allows all users unlimited access to view information and data available on the OPUP system. This level does not allow the operator to edit, delete, or create adaptation data or other operationally sensitive parameters.

3.4.4.2.2 Level 1. Level 1 access is designed to allow the shift supervisor modification access to adaptation data and operational parameters that affect the current shift operation, but do not change or adversely affect the unit operation as a whole. Sending a predefined RPS list to selected RPGs is an example that requires Level 1 access.

3.4.4.2.3 Level 2. Level 2 access is the next step up in OPUP operational security. Level 2 access is designed to restrict access to adaptation data and operational parameters that impact or affect the entire unit operations. An example of parameters that require Level 2 access is Alert Criteria selection. The selection of alert criteria values affect all users of OPUP that rely on or expect notification from the WSR-88D alerting feature.

3.4.4.2.4 Level 3. Level 3 is the highest security level available in OPUP. Level 3 access is considered supervisory level and includes items like non-associated RPG passwords and phone numbers. Adaptation data and parameters that require Level 3 access are rarely changed and may adversely impact OPUP operations if due care is not exercised.

3.4.4.3 Print. Two print icons are provided on the Product Request GUI. Selecting either icon results in the display of a print dialog. The print dialog enables the user to select either landscape or portrait print presentation and to select any configured printer.

Section 3.5. PRODUCT REQUEST INTERFACE

3.5.1 Introduction.

Section 3.5 provides step-by-step procedures for product request set management including RPS list definition, editing and control, as well as one-time request message definition, modification and implementation.

3.5.1.1 Overview. This section is divided into four subsections as follows:

- Subsection 3.5.1 Introduction. Provides an overview for the section.
- Subsection 3.5.2 Examine Product Request Sets. Provides the procedures to display the contents of the current RPS list for individual RPGs, as well as, the contents of predefine product request sets.
- Subsection 3.5.3 One-Time Requests. Provides procedures to create, modify, save, and send One-Time Request Sets.
- Subsection 3.5.4 Routine Product Sets (RPS) List Control. Provides the procedures to create, modify, save, invoke, and manage predefined RPS list definitions.

3.5.1.2 Procedures Prerequisite (Launching Product Request GUI). The following procedures assume the Product Request GUI is actively displayed on the OPUP workstation. If this is not the case, launch the Product Request GUI by clicking on the **Product Request** icon, located on the Front Panel of the OPUP workstation or on the Launch Bar of the Status and Control GUI screen. This action loads and starts an independent instance of the Product Request GUI on this OPUP workstation.

3.5.2 Examine Product Request Sets.

There is no access restriction placed on displaying the contents of product request sets. Therefore, all operators are allowed to display the current RPS list contents from any dedicated RPG, as well as the contents of any predefined product request set listed in the Canned Request Sets window.

3.5.2.1 Examine a Current RPS List.

1. In the RPG selection window click on the RPG ID of the radar of interest. The RPG ID and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the RPG selection window and the Products to Request window. The current RPS list contents for that RPG will display in the Products to Request window.
3. Examine the current RPS list contents.

3.5.2.2 Examine a Canned Product Request Set.

1. In the Canned Request Sets window click on the name of the request list of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the Canned Request Sets window and the Products to Request window. The selected canned set contents will display in the Products to Request window.
3. Examine the displayed RPS list contents.

3.5.3 One-Time Requests.

There is no access restriction for sending one-time requests. Therefore, all operators are allowed to create OTR sets for one or more products or to invoke a predefined OTR set and send these requests to any WSR-88D. However, saving a request list for future use (Save New Canned Request Set) requires access Level 1 with the appropriate password.

3.5.3.1 Create and Send a One-Time Product Request Set.

1. Delete any product definitions in the Products to Request window by clicking the **Delete All Requests in List** icon.
2. In the Edit Product window, select the desired product type from the Select a Product drop-down product list. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
3. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

4. Click the **Plus/Arrow** (Save New Product Request) located between the Edit Product and Products to Request columns.
5. Ensure the new product definition now appears in the Products to Request column.
6. Repeat Steps 2 through 5 until all desired products are included in the Products to Request window.
7. To send the request set click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
8. Click on the **Send One-Time Request(s) to Selected Connection(s)** icon. The Send One-Time Product Request dialog box is displayed.

   The following options are available in the Send One-Time Product Request dialog box:

   - Repeat Count - allows you to specify the number of concurrent volume scans for which this request will be honored. In other words, if there is a 2 in the Repeat Count field, the

RPG will process and honor the product request this volume scan and will process and honor the request again the next volume scan without further interaction on your part.

- The Repeat Count option does not apply to OTRs to non-associated (dial) RPGs.

- Current - has two meanings depending on whether the request is being forwarded to an associated or non-associated RPG.
  - For an associated RPG, Current tells the RPG to send the product from the most current volume scan, or if the specific product is not available, generate it from the replay base data stream.
  - When a request for Current product(s) is forwarded to a non-associated RPG, the RPG will send the most current product available from its data base, regardless of how old that product may be. If that particular product type, based on the specified parameters, is not available, the RPG will return a message stating PROD NOT GEN (product not generated).
- Time/Date - This selection allows you to enter the specific time and date of interest. The RPG will search its data base for a product with the correct parameters and a volume scan time within 15 minutes of the specified time. If a suitable product is found, it is sent. If a suitable product is not found, the message PROD NOT GEN (product not generated) is sent.

9. Click on the **Send** button. The request list is forwarded to the selected RPG.

3.5.3.2 Send a Predefined (Canned) One-Time Product Request Set.

1. In the Canned Request Sets window, click on the set of interest name. The set name and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the Canned Request Sets window and the Products to Request window. The selected canned set contents will display in the Products to Request window.
3. To send this request set click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
4. Click on the **Send One-Time Request(s) to Selected Connection(s)** icon. The Send One-Time Product Request dialog box is displayed.

   The following options are available in the Send One-Time Product Request dialog box:

   - Repeat Count - allows you to specify the number of concurrent volume scans for which this request will be honored. In other words, if there is a 2 in the Repeat Count field, the RPG will process and honor the product request this volume scan and will process and honor the request again the next volume scan without further interaction on your part.
     - The Repeat Count option does not apply to OTRs to non-associated (dial) RPGs.

- Current - has two meanings depending on whether the request is being forwarded to an associated or non-associated RPG.
  - For an associated RPG, Current tells the RPG to send the product from the most current volume scan, or if the specific product is not available, generate it from the replay base data stream.
  - When a request for Current product(s) is forwarded to a non-associated RPG, the RPG will send the most current product available from its data base, regardless of how old that product may be. If that particular product type, based on the specified parameters, is not available, the RPG will return a message stating PROD NOT GEN (product not generated).
- Time/Date - This selection allows you to enter the specific time and date of interest. The RPG will search its data base for a product with the correct parameters and a volume scan time within 15 minutes of the specified time. If a suitable product is found, it is sent. If a suitable product is not found, the message PROD NOT GEN (product not generated) is sent.

5. Click on the **Send** button. The request list is forwarded to the selected RPG.

3.5.3.3 Modify (Edit) and Send a One-Time Product Request Set. This procedure may be used to edit a temporary OTR set or to create a new OTR set by modifying the products and/or product parameters of a predefined OTR set. This new set may be transmitted to any RPG as an OTR; however, to save these edits for future use (Save New Canned Request Set), access Level 1 is required.

Three procedures are provided: Add a Product to an OTR List, Modifying the Parameters of a Product on an OTR List, and Delete a Product from an OTR List. The operator should use the steps from any or all three procedures to accomplish the appropriate modifications to the OTR set definition.

3.5.3.3.1 Add a Product to an OTR List. Prerequisite: This procedure assumes the Products to Request window is populated with at least one, if not multiple product definition(s). If this is not the case, see the procedures in paragraph 3.5.3.1.

1. In the Edit Product window, select the desired product type from the Select a Product drop-down product list.
2. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
3. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

4. Click the **PLUS/ARROW** (Save New Product Request) located between the Edit Product and Products to Request columns.

5. Ensure the new product definition now appears in the Products to Request column.
6. Repeat Steps 1 through 5 until all desired products are listed in the Products to Request window.

To delete individual product definitions from the request list, see the procedure in paragraph 3.5.3.3.3. To modify selected product parameters, see the procedure in paragraph 3.5.4.4.

7. To send this request set click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
8. Click on the **Send One-Time Request(s) to Selected Connection(s)** icon. The Send One-Time Product Request dialog box is displayed.

   The following options are available in the Send One-Time Product Request dialog box:

   - Repeat Count - allows you to specify the number of concurrent volume scans for which this request will be honored. In other words, if there is a 2 in the Repeat Count field, the RPG will process and honor the product request this volume scan and will process and honor the request again the next volume scan without further interaction on your part.
     - The Repeat Count option does not apply to OTRs to non-associated (dial) RPGs.
   - Current - has two meanings depending on whether the request is being forwarded to an associated or non-associated RPG.
     - For an associated RPG, Current tells the RPG to send the product from the most current volume scan, or if the specific product is not available, generate it from the replay base data stream.
     - When a request for Current product(s) is forwarded to a non-associated RPG, the RPG will send the most current product available from its data base, regardless of how old that product may be. If that particular product type, based on the specified parameters, is not available, the RPG will return a message stating PROD NOT GEN (product not generated).
   - Time/Date - This selection allows you to enter the specific time and date of interest. The RPG will search its data base for a product with the correct parameters and a volume scan time within 15 minutes of the specified time. If a suitable product is found, it is sent. If a suitable product is not found, the message PROD NOT GEN (product not generated) is sent.
9. Click on the **Send** button. The request list is forwarded to the selected RPG.

3.5.3.3.2 Modify the Parameters of a Product on an OTR List. This procedure may also be used to replace a specific product with a new product of a different product type.

Prerequisite: This procedure assumes the Products to Request window is populated with at least one, if not multiple product definition(s). If this is not the case, see the procedures in paragraph 3.5.3.1.

1. In the Products to Request window, click on the product whose parameters require modification. This will highlight the selected product and its associated parameters in inverse video.
2. Click the **Left Arrow** (Edit Selected Product Request) between the Edit Product and Products to Request columns.
3. Ensure the selected product parameters are reflected in the Edit Product window.
4. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

5. Click the **Right Arrow** (Save Changed Product Request) located between the Edit Product and Products to Request columns.
6. Ensure the new product definition now appears in the Products to Request column.
7. Repeat Steps 1 through 6 until all desired product edits are listed in the Products to Request window.

   To delete individual product definitions from the request list, see the procedures in paragraph 3.5.3.3.3. To add new products, see the procedures in paragraph 3.5.3.3.1.
8. To send this request set, click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
9. Click the **Send One-Time Request(s) to Selected Connection(s)** icon. The Send One-Time Product Request dialog box is displayed.

The following options are available in the Send One-Time Product Request dialog box:

- Repeat Count - allows you to specify the number of concurrent volume scans for which this request will be honored. In other words, if there is a 2 in the Repeat Count field, the RPG will process and honor the product request this volume scan and will process and honor the request again the next volume scan without further interaction on your part.
  - The Repeat Count option does not apply to OTRs to non-associated (dial) RPGs.
- Current - has two meanings depending on whether the request is being forwarded to an associated or non-associated RPG.
  - For an associated RPG, Current tells the RPG to send the product from the most current volume scan, or if the specific product is not available, generate it from the replay base data stream.
  - When a request for Current product(s) is forwarded to a non-associated RPG, the RPG will send the most current product available from its data base, regardless of how old that product may be. If that particular product type,

based on the specified parameters, is not available, the RPG will return a message stating PROD NOT GEN (product not generated).

- Time/Date - This selection allows you to enter the specific time and date of interest. The RPG will search its data base for a product with the correct parameters and a volume scan time within 15 minutes of the specified time. If a suitable product is found, it is sent. If a suitable product is not found, the message PROD NOT GEN (product not generated) is sent.

10. Click on the **Send** button. The request list is forwarded to the selected RPG.

3.5.3.3.3 Delete a Product from an OTR List. Prerequisite: This procedure assumes the Products to Request window is populated with at least one, if not multiple product definition(s). If this is not the case, see the procedures in paragraph 3.5.3.

1. In the Products to Request window, click on the product that is no longer desired for inclusion in the OTR list. This will highlight the selected product and its associated parameters in inverse video.
2. Click on the **Delete Selected Product** icon.
3. Ensure the selected product is deleted from the OTR list definition within the Products to Request listing.
4. Repeat Steps 1 through 3 until all undesired products have been deleted from the OTR list listed in the Products to Request window.

To add new product definitions to the request list, see the procedures in paragraph 3.5.3.3.1. To modify selected product parameters, see the procedures in paragraph 3.5.3.3.2.

5. To send this request set, click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
6. Click on the **Send One-Time Request(s) to Selected Connection(s)** icon. The Send One-Time Product Request dialog box is displayed.

   The following options are available in the Send One-Time Product Request dialog box:

   - Repeat Count - allows you to specify the number of concurrent volume scans for which this request will be honored. In other words, if there is a 2 in the Repeat Count field, the

RPG will process and honor the product request this volume scan and will process and honor the request again the next volume scan without further interaction on your part.

- The Repeat Count option does not apply to OTRs to non-associated (dial) RPGs.

- Current - has two meanings depending on whether the request is being forwarded to an associated or non-associated RPG.
  - For an associated RPG, Current tells the RPG to send the product from the most current volume scan, or if the specific product is not available, generate it from the replay base data stream.
  - When a request for Current product(s) is forwarded to a non-associated RPG, the RPG will send the most current product available from its data base, regardless of how old that product may be. If that particular product type, based on the specified parameters, is not available, the RPG will return a message stating PROD NOT GEN (product not generated).
- Time/Date - This selection allows you to enter the specific time and date of interest. The RPG will search its data base for a product with the correct parameters and a volume scan time within 15 minutes of the specified time. If a suitable product is found, it is sent. If a suitable product is not found, the message PROD NOT GEN (product not generated) is sent.

7. Click on the **Send** button. The request list is forwarded to the selected RPG.

3.5.4 Routine Product Sets (RPS) List Control.

A Routine Product Set (RPS) is a list of specific product types and associated parameters. An RPS list, when sent to an RPG, tells the RPG which products to automatically and routinely send to the OPUP each volume scan. RPS lists are designed to include product definitions that define the most suitable product mix for the evaluation, interrogation and interpretation of the expected weather phenomena. This means that RPS lists designed for winter weather support and severe convective weather support will contain different product mixes. Therefore, OPUP maintains multiple RPS list definitions. Each RPS list may contain up to 50 products and must have a unique name.

RPS list definitions that are specifically designed for particular weather phenomena or regimes may be saved along with OTR request sets as Canned Request Sets. These predefined RPS lists may be invoked as the weather conditions for a particular dedicated radar change. However, since changes to the current RPS list affect the product mix received from a particular radar, Level 1 or higher access is required to invoke a new RPS list.

On occasion, a predefined list (either RPS list or OTR set) may require modification to ensure it provides the optimum product mix to address the weather event it was designed for. The product mix definitions within a predefined (canned) list may impact the operations of several workstations; therefore, Level 1 or higher access is required to create, modify, or delete a Canned Request Set.

The procedures below define the steps required to create, modify, delete, rename and invoke RPS lists stored as Canned Request Sets.

3.5.4.1 Create and Save an RPS List.

1. Delete any product definitions in the Products to Request window by clicking the **Delete All Requests in List** icon.
2. In the Edit Product window, select the desired product type from the Select a Product drop-down product list. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
3. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

4. Click the **Plus/Arrow** (Save New Product Request) located between the Edit Product and Products to Request columns.
5. Ensure the new product definition now appears in the Products to Request column.
6. Repeat Steps 2 through 5 until all desired products are included in the Products to Request window.
7. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
8. Ensure the **Padlock** icon turns green and unlocks.
9. Save this list by clicking the **Plus/Arrow** (Save New Canned Request Set) located between the Products to Request window and the Canned Request Sets window.
10. Ensure a new set, identified as Canned, containing the number of products specified in the Products to Request window, and tagged with the current date/time is now listed in the Canned Request Sets window.
11. Click on the name **Canned** in the Canned Request Sets window. This action selects the specific RPS list and highlights it in inverse video.
12. Click on the **Pencil** (Rename Canned Request Set) icon.
13. In the drop-down dialog box type a unique name for the new canned request set. This name may be any letter/number combination up to 256 characters long.

NOTE

To create an RPG-Specific weather mode RPS list, the naming convention is: *RPGID_wxmode*. (For example, *KANC_storm* or *KRAC_clear*).

14. Click **OK**. Ensure the title of the set is renamed from Canned to the character string that you entered.
15. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

For invoking this new canned RPS list, see the procedures in paragraph 3.5.4.8.

3.5.4.2 Modify a Canned RPS List. Three procedures, adding products, modifying existing product parameters and deleting product definitions, are provided in this section. The operator should use the steps from any or all three procedures to accomplish the appropriate modifications to the RPS list definition.

NOTE

Access Level 2 is required to modify the contents of either default RPS list *storm* or *clear*. However, only access Level 1 is required to modify rpg-specific RPS lists.

1. In the Canned Request window click on the name of the of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the `Canned Request Sets` window and the `Products to Request` window. The contents of the selected canned set will display in the `Products to Request` window.
3. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
4. Ensure the **Padlock** icon turns green and unlocks.
5. In the Products to Request window, click on the product whose parameters require modification. This will highlight the selected product and its associated parameters in inverse video.
6. Click the **Left Arrow** (Edit Selected Product Request) between the Edit Product and Products to Request columns.
7. Ensure the product parameters of the selected product are reflected in the Edit Product window.
8. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

9. Click the **Right Arrow** (Save Changed Product Request) located between the Edit Product and Products to Request columns.

10. Ensure the new product definition now appears in the Products to Request column.
11. Repeat Steps 5 through 10 until all desired product edits are listed in the Products to Request window.

To delete individual product definitions from the request list, see the procedures in paragraph 3.5.3.3.3. To add new products, see the procedures in paragraph 3.5.3.3.1.

12. Save this new definition of the target RPS list by clicking the **Right Arrow** (Save Changed Product Set) located between the Products to Request column and the Canned Request Sets column.
13. Check the entries for the target canned list to ensure the Last Changed date/time reflect the current date/time and the Product Count now reflects the correct number of products.
14. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.3 Add a Product to a Canned RPS List.

1. In the Canned Request window click on the name of the of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the Canned Request Sets window and the Products to Request window. The contents of the selected canned set will display in the Products to Request window.
3. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
4. Ensure the **Padlock** icon turns green and unlocks.
5. In the Edit Product window, select the desired product type from the Select-a-Product drop-down product list.
6. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
7. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

8. Click the **PLUS/ARROW** (Save New Product Request) located between the Edit Product and Products to Request columns.
9. Ensure the new product definition now appears in the Products to Request column.
10. Repeat Steps 5 through 9 until all desired products are listed in the Products to Request window.

NOTE

To delete individual product definitions from the request list, see paragraph 3.5.3.3.3. To modify selected product parameters, see paragraph 3.5.3.3.2.

11. Save this new definition of the target RPS list by clicking the **Right Arrow** (Save Changed Product Set) located between the Products to Request column and the Canned Request Sets column.
12. Check the entries for the target canned list to ensure the Last Changed date/time reflect the current date/time and the Product Count now reflects the correct number of products.
13. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.4 Modify the Parameters of a Product in a Canned RPS List. This procedure may also be used to replace a specific product with a new product of a different product type.

1. In the Canned Request window, click on the name of the set of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the Left Arrow between the Canned Request Sets window and the Products to Request window. The contents of the selected canned set will display in the Products to Request window.
3. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
4. Ensure the **Padlock** icon turns green and unlocks.
5. In the Products to Request window, click on the product whose parameters require modification. This will highlight the selected product and its associated parameters in inverse video.
6. Click the **Left Arrow** (Edit Selected Product Request) between the Edit Product and Products to Request columns.
7. Ensure the product parameters of the selected product are reflected in the Edit Product window.
8. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

9. Click the **Right Arrow** (Save Changed Product Request) located between the Edit Product and Products to Request columns.
10. Ensure the new product definition now appears in the Products to Request column.

11. Repeat Steps 5 through 10 until all desired product edits are listed in the Products to Request window.

To delete individual product definitions from the request list, see the procedures in paragraph 3.5.4.5. To add new products, see the procedures in paragraph 3.5.4.3.

12. Save this new definition of the target RPS list by clicking the **Right Arrow** (Save Changed Product Set) located between the Products to Request column and the Canned Request Sets column.
13. Check the entries for the target canned list to ensure the Last Changed date/time reflect the current date/time and the Product Count now reflects the correct number of products.
14. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.5 Delete a Product From an RPS List.

1. In the Canned Request window, click on the name of the set of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the Left Arrow between the Canned Request Sets window and the Products to Request window. The contents of the selected canned set will display in the Products to Request window.
3. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
4. Ensure the **Padlock** icon turns green and unlocks.
5. In the Products to Request window, click on the product that is no longer desired for inclusion in the OTR list. This will highlight the selected product and its associated parameters in inverse video.
6. Click on the **Delete Selected Product** icon.
7. Ensure the selected product is deleted from the list definition within the Products to Request listing.
8. Repeat Steps 5 through 7 until all undesired products have been deleted from the list listed in the Products to Request window.

To add new product definitions to the request list, see the procedures in paragraph 3.5.4.3. To modify selected product parameters, see the procedures in paragraph 3.5.4.4.

9. Save this new definition of the target RPS list by clicking the **Right Arrow** (Save Changed Product Set) located between the Products to Request column and the Canned Request Sets column.
10. Check the entries for the target canned list to ensure the Last Changed date/time reflect the current date/time and the Product Count now reflects the correct number of products.

11. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.6 Delete a Canned RPS List Definition.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 2, enter the Level 2 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns yellow and unlocks.
3. In the Canned Request window, click on the name of the set of interest. The set name and associated information will be highlighted in inverse video.
4. Click on the **Delete Canned Product Set** icon. A dialog box asking `Are you sure you want to delete this canned set?` displays.
5. If you are sure, click on **Yes**. If you are not sure, select **No**.
6. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.7 Rename a Canned RPS List.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns green and unlocks.
3. In the Canned Request window, click on the name of the RPS List of interest. The set name and associated information will be highlighted in inverse video.
4. Click on the **Pencil** (Rename Canned Request Set) icon.
5. In the drop-down dialog box, type a new unique name for the canned RPS List. This name may be any letter/number combination up to 256 characters long.
6. Click **OK**. Ensure the name of the RPS List is changed from original name to the character string that you entered.
7. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

3.5.4.8 Invoke a Canned RPS List.

1. In the Canned Request window click on the name of the RPS list of interest. The set name and associated information will be highlighted in inverse video.
2. Click on the **Left Arrow** between the Canned Request Sets window and the Products to Request window. The contents of the selected canned set will display in the Products to Request window.

3. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter the Level 1 password in the field, then click **OK**.
4. Ensure the **Padlock** icon turns green and unlocks.
5. In the RPG selection window, place the cursor over the desired associated RPG ID (the dedicated communications line must be connected) and click. Ensure the desired target RPG is highlighted.
6. Click on the **Right Arrow** (Send Product Request(s) to Selected Connection(s)) between the Products to Request and RPG selection windows.
7. Ensure the RPS List name in the RPG selection window for the appropriate RPG is now updated to the same name as expected. Additionally, ensure that the Date Sent entry is updated to the current date/time.
8. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

CHAPTER 4
OPUP PRODUCT DISPLAY AND MANIPULATION

Section 4.1. INTRODUCTION

4.1.1 General.

This chapter provides specific OPUP functionality explanations and detailed procedures for one-time product requests, product display, and product manipulation.

4.1.2 Chapter Organization.

Chapter 4 is organized into six sections as follows:

- Section 4.1.INTRODUCTION - Provides a brief description of each section found in Chapter 4.
- Section 4.2.PRODUCT DISPLAY GUI INTERACTION - Provides an overview of the OPUP Applications Software interaction.
- Section 4.3.PRODUCT DISPLAY GUI - Provides information defining the product display and product manipulation, one-time request, and alert registration functions available via the Product Display GUI interface.
- Section 4.4.PRODUCT DISPLAY PROCEDURES - Provides step-by-step procedures required to display operator selected products via the Product Display GUI.
- Section 4.5.PRODUCT MANIPULATION FUNCTIONS - Provides descriptive information pertaining to the various OPUP product manipulation functions.
- Section 4.6.PRODUCT MANIPULATION PROCEDURES - Provides step-by-step procedures required to perform the various display manipulation functions available via the Product Display GUI interface.

Section 4.2. PRODUCT DISPLAY GUI INTERACTION

4.2.1 Introduction.

The OPUP user interface design is based on a familiar windows-like graphical user interface that is used throughout the computer world.

4.2.2 Graphical Icons.

The use of graphic icons to execute commands and functions is used extensively throughout the OPUP Applications Graphical User Interface design. Icons that are not valid selections due to the current active process or the user access level are de-sensitized (greyed-out in appearance).

4.2.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names (like passwords, IP addresses, site specific IDs, etc.) are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all command portions that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with an actual name, address, password, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

Section 4.3. PRODUCT DISPLAY GUI

4.3.1 Introduction.

WSR-88D products are displayed for analysis and interrogation via a windowed graphical user interface (GUI) called the Product Display GUI. The following sections describe, in detail, the operator interactions for product display and manipulation using the Product Display GUI.

4.3.1.1 Launching the Product Display GUI. The Product Display GUI is a main function of the OPUP operational software suite. To activate the Product Display GUI, from the OPUP work space, click on the Product Display icon, located on the work space window Front Panel. This action loads and starts a new, independent, instance (one instance per login user name) of the Product Display GUI software and configures the display according to the user profile.

4.3.1.2 User Profile. Upon exiting the Product Display GUI, the OPUP records the current display configuration in a User Profile. The User Profile maintains:

- placement and size of each display window,
- displayed window contents (product type, origin radar and elevation (if applicable),
- the Auto Update flag for each window,
- maps and overlays displayed with each product, and
- active color pallet selected by that user (if it still exists, if not the colors will revert to the default color scheme).

The next time that login user launches a Product Display GUI instance, the User Profile is read and the Product Display GUI is presented in the same configuration as it was prior to the exit.

4.3.1.3 Multi-User Environment. The OPUP software is designed to support a multi-user environment. For OPUP configurations with adequate processing capacity (viz., Large and Medium configurations) multiple workstations may access, display and manipulate WSR-88D products via independent Product Display GUI instances. The products displayed and manipulations performed on a particular workstation are not limited or affected by product display actions on other workstations.

4.3.1.4 Product Display GUI Overview. The display technology incorporated in OPUP applications software will allow up to 12 independent product display windows per screen. The operator has the ability to specify the size and screen location for each window. Additionally, each of these windows is treated as an autonomous display allowing the operator to specify the product type, source RPG, and update flag independent of any other window. Another advantage of this autonomy is each product can be manipulated without affecting any other product in any other window. Refer to Figure 4-1 for an example.

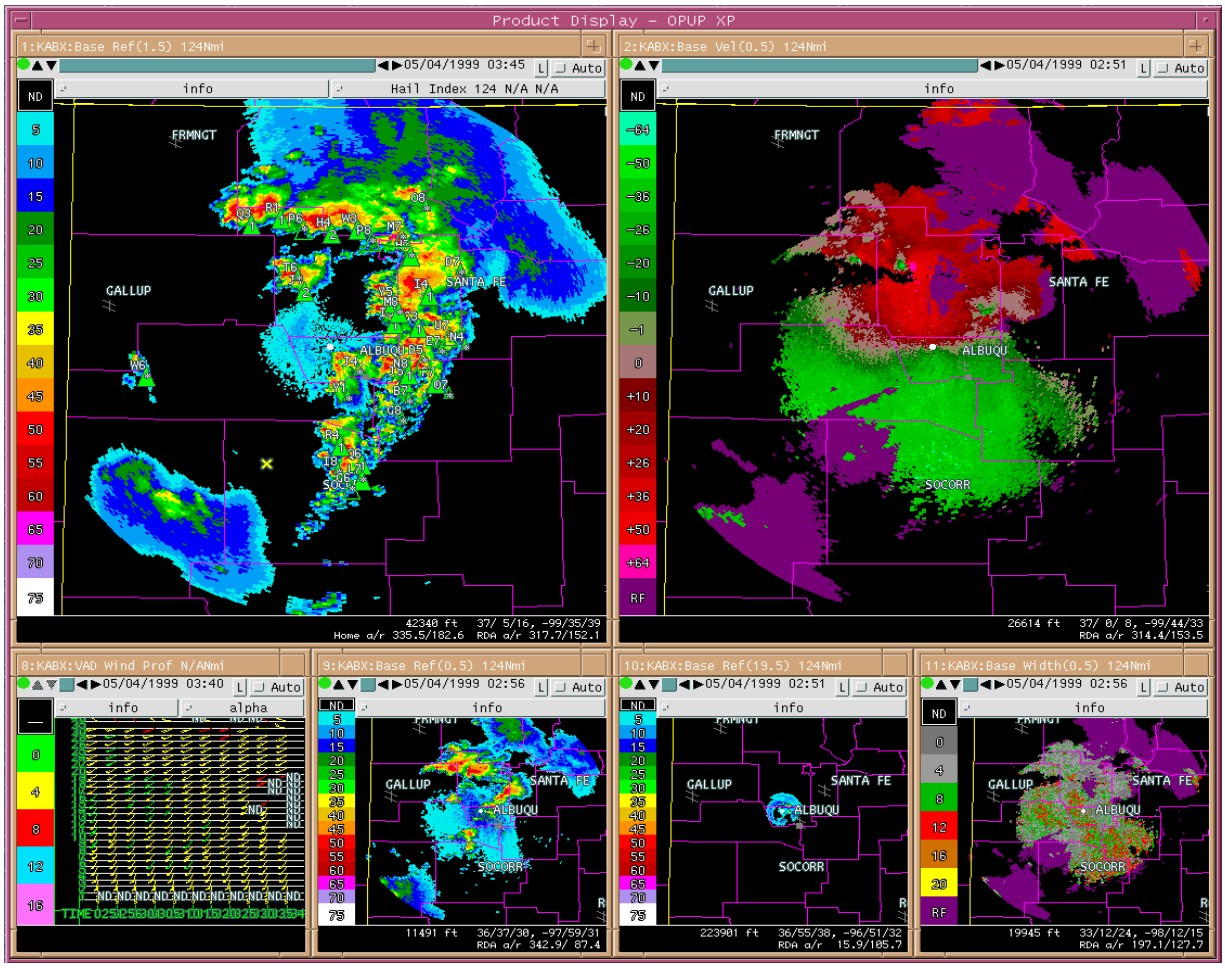


Figure 4-1. OPUP Product Display GUI

4.3.2 Display Window Configuration.

The example in Figure 4-1 shows one popular display configuration: two large display windows and four small ones. Even though OPUP supports 12 display windows, only seven are visible in this example. In this case, under each large window (upper left and right windows) there are other windows, fully populated with specified products and available for viewing with the click of a mouse button.

4.3.2.1 Resize Window. The display windows may be resized by clicking on the window frame surrounding the display window and dragging the frame to the desired location. The frame may be selected on either side or display window corner. The window may be resized in increments of the default window size. The new window borders will be indicated by a highlighted new window outline. The new window size will take effect when the mouse button is released. The application will not allow the display window to be made larger than the application window.

4.3.2.2 Restack Windows. The following two options are provided to control the order of the stacked display windows.

4.3.2.2.1 Display Next Window in Stack. When windows are stacked on top of each other, a square button appears on the upper, right-hand, title-bar side. This is an indication that one or more product windows is obscured by the currently displayed window. To increment down through the window stack **right** click in the window border. The process will reorder the window stack displaying the next window in the stack and sending the previously displayed window to the bottom of the stack.

4.3.2.2.2 Reorder Stack. The user may also display a list of product display windows covered by the current display window by pressing and holding the left mouse button on the square button on the upper, right-hand, side of the title-bar . This will display the RPG source, product name, elevation, and resolution of each display window that is covered by the top display window. The user may then highlight one of these products by moving the cursor over the desired product selection. The selected product display window will be moved to the top of the display stack (displayed in the window) by releasing the mouse button.

4.3.2.3 Move Windows. The display windows may also be moved within the confines of the application window by clicking and dragging the title bar of any display window. If multiple windows occupy the same area, the windows may be raised (**left** mouse button) or lowered (**right** mouse button) through the stack by clicking the appropriate mouse button in the frame surrounding the display window or in the display window title bar.

4.3.3 Product Display GUI Interface.

The Product Display GUI (pdgui) is designed to provide all product display and manipulation functions via menu selections using the mouse, thereby freeing the operator from the keyboard. Depressing the mouse button selects the option or executes the command/function represented by the icon directly under the cursor.

The Product Display window has four distinct areas that are used for specific display functions.

4.3.3.1 Product Information Area. The Product Information Area (Figure 4-2) provides the specific information pertaining to the currently displayed product. Additionally, the Product Information Area contains product display controls, including product selection, time lapse activation, product forward/backward, etc.

Figure 4-2. Product Information Area

4.3.3.1.1 Displayed Product Information. The following information is provided in the display window to describe the currently displayed product.

- Window Number
- Source RPG ID
- Product Name
- Elevation Angle (if applicable)
- Product Display Range
- Hidden Windows Indicator
- Product Date
- Product Time

NOTE

The Product Time will be displayed in inverse video if the difference between the current (server) time and the Product Time is greater than 12 minutes.

4.3.3.1.2 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process are de-sensitized (greyed-out in appearance). An explanation/definition of the Product Display GUI icons is provided below;

Radar

Indicates the current host radar connection status for the product in the display window. For an explanation of the radar icon color codes, see paragraph 6.4.2.

Up Arrow

Automatically displays the next higher elevation angle product with the same parameters as the currently displayed product. This icon is only active for elevation-based products.

Down Arrow

Automatically displays the next lower elevation angle product with the same parameters as the currently displayed product. This icon is only active for elevation-based products.

Product Selection Bar

Presents a list of WSR-88D products and provides the ability to set specific product parameters to define the exact product desired for display in the product display window.

Left Arrow

Automatically displays the next oldest product (product from a previous volume scan) with the same parameters as the currently displayed product.

Right Arrow

Automatically displays the next newest product (product from a more recent volume scan) with the same parameters as the currently displayed product.

Loop

Initiates the building and sequencing of a time lapse loop. If a looping sequence is active then this icon stops the loop sequence.

Auto Update

The user may also command the product display window to auto-update as new products of the current description (as defined in the Product Selection Dialog) are received from the RPG. If the elevation angle is specified in the Product Selection Dialog, the image will update only when that elevation angle is received. If the 0.0 option is selected as the elevation angle, the image will update when any elevation of that product is received from the RPG.

4.3.3.1.3 Product Display/Request Control. Selection of the Product Selection Bar displays the Product Selection Dialog which provides the options that enable the user to populate the product display windows with products currently resident in the OPUP database and to make one-time requests for products that are not otherwise available.

4.3.3.1.3.1 Product Selection Dialog. The Product Selection Dialog (Figure 4-3) provides the buttons defined in the following paragraphs for product parameter selection and display control. For step-by-step instructions defining the process of populating a Product Display window, refer to paragraphs 4.4.1.1 and 4.4.1.2.

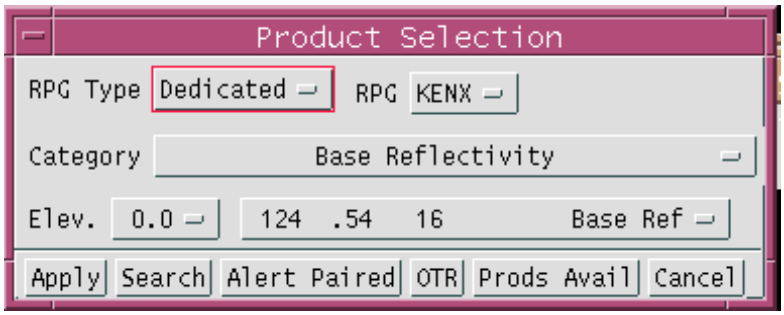


Figure 4-3. Product Selection Dialog

4.3.3.1.3.1.1 RPG Type. Displays the current sort option. Upon selection, it provides three sort options for RPG selection:

- Dedicated - Lists all dedicated (associated) RPGs (RPGs with which the OPUP has a dedicated communication circuit)
- AOR - Lists all associated and non-associated RPGs that are in and immediately adjacent to the host OPUP area of responsibility
- All (Others) - Lists all other non-associated RPGs

4.3.3.1.3.1.2 RPG. Displays the currently selected RPG ID. Upon selection, it lists all RPGs for the selected RPG Type sort option.

4.3.3.1.3.1.3 Category. Provides a high level listing of all WSR-88D products.

4.3.3.1.3.1.4 Elev (Elevation). Defines the specific elevation slice to define the product. Upon selection, it lists all valid WSR-88D product elevations plus 0.0. The 0.0 option is a wildcard for all elevations. This wildcard can be used with either the **Apply** or **Search** buttons with the following results.

- When 0.0 is selected, followed by **Apply** the most recently received product of the specified product type, regardless of elevation angle, is displayed.
- When 0.0 is selected, followed by **Search** a listing of all products of the specified product type, regardless of elevation angle, is displayed.

NOTE

With Auto update active, when the Elev (elevation) parameter 0.0 is specified as part of the product selection process, the display GUI will automatically update that window with each time a product that matches the product selection criteria is received, regardless of elevation angle.

4.3.3.1.3.1.5 Select Specific Product. When a specific type is selected, the operator is presented the valid data level and resolution options to identify the unique WSR-88D product.

NOTE

The Range parameter is tied directly to the data resolution for a particular product. The product's display range (Range) is provided for information only and is not an editable selection.

4.3.3.1.3.1.6 Apply. When selected, searches the local OPUP database for a product whose parameters match the specified selections. If a matching product is found it is immediately displayed in the host product display window. If an exact match is not found an information dialog box stating, `“There are no products matching the desired parameters”` is displayed.

4.3.3.1.3.1.7 Search. When selected, searches the local OPUP database for any products whose parameters match the specified selections and provides a chronological results listing. If there are

no products in the database that have the specified parameters, an information dialog box stating, "`There are no products matching the desired parameters`" is displayed.

4.3.3.1.3.1.8 Alert Paired. When selected, provides a chronological listing of all alert paired products from the specified RPG. If there are no alert paired products from the specified RPG in the database, an information dialog box stating, "`There are no products matching the desired parameters`" is displayed.

4.3.3.1.3.1.9 One Time Request (OTR). Opens the One-Time Request Dialog Box. The One-Time Request Dialog (Figure 4-4) allows the operator to specify individual unique product definitions for a OTR. The specific OTR options available include product type selection, distribution priority selection, product dependent fields definition, send and send clear option, and cancel.

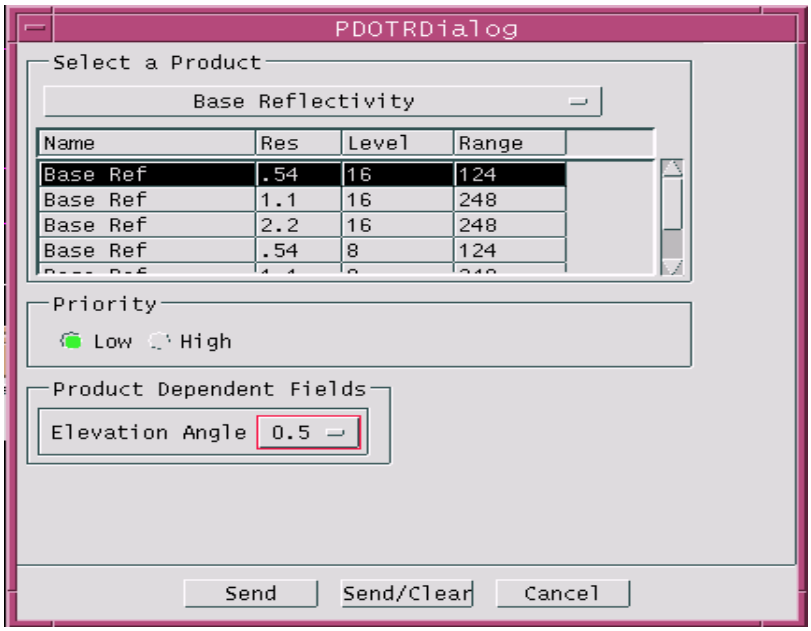


Figure 4-4. Product Display GUI OTR Dialog

For step-by-step instructions defining the process defining and initiating one-time requests, refer to paragraphs 4.4.2.1, 4.4.2.2, and 4.4.2.3.

4.3.3.1.3.1.9.1 Select a Product. Individual WSR-88D products are characterized by product type (e.g., reflectivity, velocity, etc.), data level (viz., 8 or 16), and data resolution (e.g., .13 nm, 2.2 nm, etc.). The Select-a-Product portion of the OTR GUI provides a listing of all WSR-88D product types. When a specific type is selected, the operator is presented the valid data level and resolution options to identify the unique WSR-88D product.

NOTE

The Range parameter is tied directly to the data resolution for a particular product. The product's display range (Range) is provided for information only and is not an editable selection.

4.3.3.1.3.1.9.2 Priority. The Priority selection allows the operator to select the RPG-to-OPUP transmission individual product priority. The priority selection (Low or High) dictates which products rise to the top of the queue when more than one product is waiting for transmission. If all waiting products have the same transmission priority, then the products are transmitted using the first in, first out scheme.

4.3.3.1.3.1.9.3 Product Dependent Fields. In addition to the general product characteristics of product type, data level and resolution, many WSR-88D products require additional parameters (e.g., elevation angle, storm speed/direction, altitude, etc.) to define them as unique products. See Table 3-1, for a complete list of available products and attendant parameters. The Product Dependent Fields section of the Edit Product window allows the operator to specify these parameters to ensure the exact product is generated by the RPG.

When a product type that allows additional product dependent parameters is selected in the Select-a-Product section, the Product Dependent Fields section updates to present the operator with the valid selections pertaining to that product. The Product Dependent Fields are:

- `Elevation Angle -` defines the specific slice to derive the product.
- `Storm Speed -` along with Storm Direction, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Storm Direction -` along with Storm Speed, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Azimuth -` defines the azimuth angle (from the RDA) and is used in conjunction with Range to define a location for a product center or end point.
- `Range -` defines the range (from the RDA) and is used in conjunction with Azimuth to define a location for a product center or end point.
- `Altitude -` defines the altitude MSL for Velocity Azimuth Display product definition.
- `End Hour -` defines the ending hour and is used in conjunction with Time Span to define the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Time Span -` used in conjunction with End Hour, defines the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Lowest Clutter Filter Map -` specifies Elevation Segment 1 for the Clutter Filter Control product definition. Elevation Segment 1 includes all elevation angles below 2 degrees.
- `Upper Clutter Filter Map -` specifies Elevation Segment 2 for the Clutter Filter Control product definition. Elevation Segment 2 includes all elevation angles at 2 degrees and above.

- `Surveillance -` specifies the Surveillance Channel for the Clutter Filter Control product definition.
- `Doppler -` specifies the Doppler Channel for the Clutter Filter Control product definition.

4.3.3.1.3.1.9.4 Send. Sends the OTR to the appropriate RPG. When received, the product will be stored in the OPUP database.

4.3.3.1.3.1.9.5 Send/Clear. Sends the OTR to the appropriate RPG, clears the originating product display window, and registers for the product receipt message for that product. When the product is received, it will be automatically displayed in the originating (now clear) window and stored in the OPUP database.

NOTE

When a nonassociated RPG is selected (from the AOR or All (Others) lists) the selection of either Send or Send Clear automatically invokes a dial out one-time request to the selected RPG.

4.3.3.1.3.1.9.6 Cancel. Closes the One-Time Request Dialog and displays the Product Selection Dialog.

4.3.3.1.3.1.10 Prods Avail. This button displays the latest Product Availability List from the selected RPG (Figure 4-5). Upon dial communications line connection, the RPG automatically sends the OPUP a list of available products. This list is useful to a nonassociated OPUP as it defines the list of products that are available to this class of user (remember, an associated user can force product generation and therefore, can have any product desired; but a nonassociated user can only have products that have been previously generated - reflected on this list).

.

Products Available From KENX (Wed Sep 11 23:05:56 2

Product Name	Level	Res	Slice	Param 1	Param 2	Param 3	Param 4
1-HR Precip	16	1.1		0	0	0	0
3-HR Precip	16	1.1		0	0	0	0
Base Ref	16	1.1	2.4	0	0	0	0
Base Ref	16	1.1	1.5	0	0	0	0
Base Ref	16	1.1	0.5	0	0	0	0
Base Ref	16	.54	3.4	0	0	0	0
Base Ref	16	.54	2.4	0	0	0	0
Base Ref	16	.54	1.5	0	0	0	0
Base Ref	16	.54	0.5	0	0	0	0
Base Vel	16	.54	3.4	0	0	0	0
Base Vel	16	.54	2.4	0	0	0	0
Base Vel	16	.54	1.5	0	0	0	0
Base Vel	16	.54	0.5	0	0	0	0
Base Vel	16	.13	0.5	0	0	0	0
Base Width	8	.54	3.4	0	0	0	0
Base Width	8	.54	2.4	0	0	0	0
Base Width	8	.54	1.5	0	0	0	0
Base Width	8	.54	0.5	0	0	0	0
Base Width	8	.13	0.5	0	0	0	0
Cltr F Cntrl	8	.54		5	0	0	0
Cltr F Cntrl	8	.54		3	0	0	0
Cltr F Cntrl	8	.54		4	0	0	0
Cltr F Cntrl	8	.54		2	0	0	0
Cmp Ref	16	2.2		0	0	0	0
Echo Tops	16	2.2		0	0	0	0
Hail Index	N/A	N/A		0	0	0	0
Hy Scan Ref	16	.54		0	0	0	0
L Cmp R AP R	8	2.2		0	0	0	0
L1 CMP R MAX	8	2.2		0	0	0	0
L2 CMP R MAX	8	2.2		0	0	0	0
L3 CMP R MAX	8	2.2		0	0	0	0
Meso	N/A	N/A		0	0	0	0
SWA Prob	N/A	.54		0	0	0	0
Sr Vel Map	16	.54	1.5	0	0	-1	-1
Sr Vel Map	16	.54	0.5	0	0	-1	-1
Strm Precip	16	1.1		0	0	0	0
Strm Struct	N/A	N/A		0	0	0	0
Strm Trak	N/A	N/A		0	0	0	0
Torn	N/A	N/A		0	0	0	0
User Alert	N/A	N/A		0	0	0	0
User Precip	16	1.1		12	24	0	0
VAD Wind Pro	5	5 kts		0	0	0	0
VIL	16	2.2		0	0	0	0

Request List Cancel

Figure 4-5. Product Availability List (PAL)

4.3.3.1.3.1.10.1 Request List. Selection of this button requests a new Product Availability List from the radar specified.

4.3.3.1.3.1.10.2 Cancel. Closes the Product Availability List Dialog and displays the Product Selection Dialog.

4.3.3.1.3.1.11 Cancel. Closes the Product Selection dialog box.

4.3.3.2 Radar Information and Tabular Data Display Area. Immediately below the Product Information Area is the Product Parameter Information and Tabular Data Display Area. This area provides selectable buttons that, when selected, display radar- and product-unique information, and tabular product data.

4.3.3.2.1 Radar Information (info button). The transmission header of each product contains mandatory information fields (i.e., unique information that is specific to the source radar) and optional fields that pertain solely to that individual product. To access this information, an **info** button (Figure 4-6) is provided at the top of each displayed product. When the info button is selected a drop-down text box displayed in which this information is provided. To close this display, reselect the **info** button.

Figure 4-6. info Button

4.3.3.2.2 Mandatory Information. Every product info window provides the following mandatory information fields.

4.3.3.2.2.1 RPG Name. This field provides the source RPG mnemonic ID and should match the RPG ID provided in the Product Information area.

4.3.3.2.2.2 RDA Height. The height in feet of the feedhorn center.

4.3.3.2.2.3 Product Resolution. The highest resolution which data is available for display.

4.3.3.2.2.4 Product Range. The maximum display range that data is available for this product.

4.3.3.2.2.5 Wx Mode. The weather mode the radar was operating in when the data for this product was collected.

4.3.3.2.2.5.1 VCP. The volume coverage pattern being employed when the data for this product was collected.

4.3.3.2.2.6 Threshold Units. Provides the measurement units of the displayed product (e.g., dBZ, kts, etc.).

4.3.3.2.2.7 Elevation Angle. For elevation-based products, the elevation angle that this product data was collected. Volume products (e.g., VIL) will display n/a.

4.3.3.2.2.8 Max. This field provides the data type (Reflectivity, Positive Velocity, etc.), maximum data value, and units (e.g., dBZ, kts, etc.) associated with this product. For velocity-based products there are two Max fields: one for negative (inbound) and one for positive (outbound) maximum data values.

4.3.3.2.3 Product Parameters. The following information is provided based on product type.

4.3.3.2.3.1 Storm Relative Mean Radial Velocity. Each Storm Relative Mean Radial Velocity product (SRR and SRM) provides the following information to aid in interpretation.

- `Motion Source Flag -` This field identifies whether the storm motion vector (see Avg Speed of Storms below) was;
  - `Operator Defined Motion -` (specified by the operator), or
  - `Avg Storm Motion -` (supplied by the Storm Cell Identification and Tracking (SCIT) algorithm)
- `Avg Speed of Storms -` Used in conjunction with Avg Direction of Storms to define the storm motion vector. This storm motion vector was subtracted from each gate in the base velocity wind field. The resultant velocity wind field is Storm Relative Mean Radial Velocity, that is, the wind field relative to a moving target (storm).
- `Avg Direction of Storms -` See Avg Speed of Storms above.

4.3.3.2.3.2 Layer Composite Reflectivity. Layer Composite Reflectivity products, including the Layer Composite Reflectivity AP Removed (APR) product, are defined by the inclusive layer of atmosphere from which the data were gather to derive the product. Therefore, each layered product provides the following information to aid in interpretation.

- `Bottom of Layer -` Either Surface or an integer value (times 1000 feet) MSL.
- `Top of Layer -` Value (times 1000 feet) MSL

4.3.3.2.3.3 Velocity Wind Profile (VWP). The VWP product provides the following information to aid in interpretation.

- `Max Speed (Horiz) -` Maximum wind speed, in knots, from the latest (most recent) wind profile.
- `Direction of Max Speed -` Direction of the maximum wind found in degrees.
- `Altitude of Max Speed -` The maximum wind height from the latest (most recent) wind profile in 1000s of feet (kft).

4.3.3.2.3.4 Velocity Azimuth Display (VAD). The VAD product provides the following information to aid in interpretation.

- `Wind Speed (Horiz) -` The VAD-derived true wind speed.
- `Wind Direction (Horiz) -` The VAD-derived true wind direction.
- `Wind Altitude (Horiz) -` The VAD product altitude (MSL).
- `Elevation Angle -` The data elevation angle for the VAD analysis. Data from this elevation angle and a constant slant range result in the desired height (altitude) for the wind field analysis.
- `Slant Range -` Range, in nm, down the radar beam to achieve the desired analysis height.
- `RMS Error -` Root Mean Square error is a variation calculation of the velocity plots from the best fit sine wave.

4.3.3.2.3.5 Cross Section Products. All Cross Section products provide the following information to aid in interpretation.

- `Azimuth point 1 -` Combined with Range point 1, specifies one end-point for the cross section line.
- `Range point 1 -` See Azimuth point 1, above.
- `Azimuth point 2 -` Combined with Range point 2, specifies one end-point for the cross section line.
- `Range point 2 -` See Azimuth point 2, above.

4.3.3.2.4 Tabular Product Data. Several WSR-88D products include attributes tables and alphanumeric output that provide complementary information to aid in the identification and location of particular phenomena. Attributes tables are provided for several WSR-88D products to provide pertinent information regarding algorithm identified parameters and features

4.3.3.2.4.1 Product Attributes Tables. Products for which attributes tables are available are Composite Reflectivity, Storm Track, Hail Index, MESO, TVS, MRU, TRU, and Echo Tops Contour. When one of these products is selected for display, either as a stand-alone product or as an overlay, its associated attributes table is made available for viewing by selecting the appropriate button (attr if the product is the host product or the product name if it is an overlay) in the Product Parameters and Tabular Data Display Area.

Selecting a particular cell/feature in an attributes table will set the selected cursor position coordinates to the azimuth and range indicated in the table for the selected storm/feature. This is essentially the same as selecting that storm on the product itself. This feature facilitates the RECENTER function as well as the ZOOM and CELL TRENDS functions. By selecting the desired function then clicking on a storm/feature within an attribute table, an operator can quickly recenter or zoom the display, or generate a CELL TRENDS display for the selected storm, even when the selected storm is not within the display window.

The following Attributes Table information is provided based on product type.

4.3.3.2.4.2 Composite Reflectivity. The combined attributes table is included as part of the Composite Reflectivity product. This table provides a quick summary of the various severe weather identification algorithm results for each identified storm.

The specific entry definitions are provide in Table 4-1 below:

Table 4-1. Composite Reflectivity Product Attributes

ATTRIBUTE	DEFINITION
STM ID	Unique storm identifier assigned by the SCIT algorithm
AZ/RAN	Storm azimuth and range centroid location
TVS	TVS if a TVS has been identified with this particular storm

Table 4-1. Composite Reflectivity Product Attributes (Continued)

ATTRIBUTE	DEFINITION
MESO	Either MESO, 3DCO (3-D correlated shear), UNCO (uncorrelated shear), or NONE based on the identification and classification output of the Mesocyclone Identification algorithm
POSH	Probability of severe hail (hail < 3/4 inch)
POH	Probability of hail (any size)
MX SIZE	Maximum expected hail size in inches
VIL	Cell-based VIL for the identified storm cell
dBZM	Maximum reflectivity value (dBZ) associated with the storm
HT	Maximum reflectivity height (dBZM)
TOP	Storm top height in kft
FCST MVMT	The forecast movement of the storm centroid based on its past movement history. NEW if there is no past history on which to base the forecast.

4.3.3.2.4.3 Storm Track. The specific entry definitions are provide in Table 4-2 below:

Table 4-2. Storm Track Product Attributes

ATTRIBUTE	DEFINITION
STORM ID	The unique storm identifier assigned by the SCIT algorithm
AZ/RAN	The storm centroid location azimuth and range
FCST MVT	The storm centroid forecast movement based on its past movement history. NEW if there is no past history on which to base the forecast
ERR/MEAN	The ERR (forecast error) is the distance (in nm) between: 1) the forecasted position for this volume scan (forecast made the previous volume scan) and 2) the actual cell position in this volume scan. The MEAN (forecast error) is the average distance (in nm) of the forecast errors for the cell during the cell's life time. Both of these values should give you an idea of how well SCIT is tracking storms for the last volume scan (forecast error) and overall (mean error). If SCIT is tracking good, the errors should be small relative to the speed.
dBZM HGT	The maximum reflectivity value (dBZ) associated with the storm and the maximum reflectivity height in kft

4.3.3.2.4.4 Hail Index. The specific entry definitions are provide in Table 4-3 below:

Table 4-3. Hail Index Product Attributes

ATTRIBUTE	DEFINITION
STORM ID	Unique storm identifier assigned by the SCIT algorithm
AZ/RAN	Azimuth and range of the storm centroid location
POSH	Probability of severe hail (hail < 3/4 inch)
POH	Probability of hail (hail any size)
MAX HAIL	Maximum expected hail size in inches

4.3.3.2.4.5 MESO. The specific entry definitions are provide in Table 4-4 below:

Table 4-4. MESO Product Attributes

ATTRIBUTE	DEFINITION
STORM ID	Unique storm identifier assigned by the SCIT algorithm
FEATURE	Either MESO, 3DCO (3-D correlated shear), or UNCO (uncorrelated shear) based on the identification and classification output of the Mesocyclone Identification algorithm
AZ/RAN	Azimuth and range of the identified feature location
BASE	Identified feature base height in kft
TOP	Identified feature top height in kft
RAD	Identified feature radius
AZDIA	Identified feature azimuthal diameter

4.3.3.2.4.6 TVS. The specific entry definitions are provide in Table 4-5 below:

Table 4-5. TVS Product Attributes

ATTRIBUTE	DEFINITION
TYPE	Feature type - either TVS or ETVS
STORM ID	Unique storm identifier assigned by the SCIT algorithm
AZ/RAN	Azimuth and range of the identified feature location
LLDV	Low-Level Delta Velocity - greatest velocity difference of the lowest 2-D circulation, in knots
MDV	Maximum Delta Velocity - greatest velocity difference of any 2-D circulation, in knots

Table 4-5. TVS Product Attributes (Continued)

ATTRIBUTE	DEFINITION
AVGDV	Average Delta Velocity - average weighted velocity difference of all 2-D circulations, in knots
BASE	The lowest altitude of the 3-D circulation (altitude of the lowest 2-D circulation), in kft ARL
DEPTH	The 3-D circulation depth (height difference between the lowest and highest 2-D circulations), in kft ARL

4.3.3.2.4.7 MRU. The specific entry definitions are provided in Table 4-6 below:

Table 4-6. MRU Product Attributes

ATTRIBUTE	DEFINITION
STATUS/ID	The status assigned by the Meso-cyclone Detection Algorithm; either EXT, NEW, PER or INC. The ID is the unique storm identifier.
FEATURE	Either MESO, 3DCO (3-D correlated shear), or UNCO (uncorrelated shear) based on the identification and classification output of the Mesocyclone Identification algorithm
AZ/RAN	The azimuth and range of the identified feature location
BASE	The identified feature base height in kft
TOP	The identified feature top height in kft
RAD	The identified feature radius
AZDIA	The identified feature azimuthal diameter

4.3.3.2.4.8 TRU. The specific entry definitions are provided in Table 4-7 below:

Table 4-7. TRU Product Attributes

ATTRIBUTE	DEFINITION
STATUS/ID	The status assigned by the Meso-cyclone Detection Algorithm; either EXT, NEW, PER or INC. The ID is the unique storm identifier.
FEATURE	Either MESO, 3DCO (3-D correlated shear), or UNCO (uncorrelated shear) based on the identification and classification output of the Mesocyclone Identification algorithm
AZ/RAN	The azimuth and range of the identified feature location
BASE	The identified feature base height in kft
TOP	The identified feature top height in kft

Table 4-7. TRU Product Attributes (Continued)

ATTRIBUTE	DEFINITION
RAD	The identified feature radius
AZDIA	The identified feature azimuthal diameter

4.3.3.2.4.9 Alphanumeric Product Data (alpha). Alphanumeric products are provided for Storm Structure, Storm Track, Hail Index, MESO, TVS, MRU, and TRU products to provide similar information regarding algorithm identified parameters and features as the Attributes Tables. However, in addition to the algorithm output, the alphanumeric data also includes a listing of the RPG adaptable parameter settings used during the processing that volume scan. Selecting the **alpha** button displays these data in a scrollable drop-down window.

4.3.3.3 Product Display Area. All RPG-produced products are displayed within the Product Display Area (Figure 4-7) of a display window.

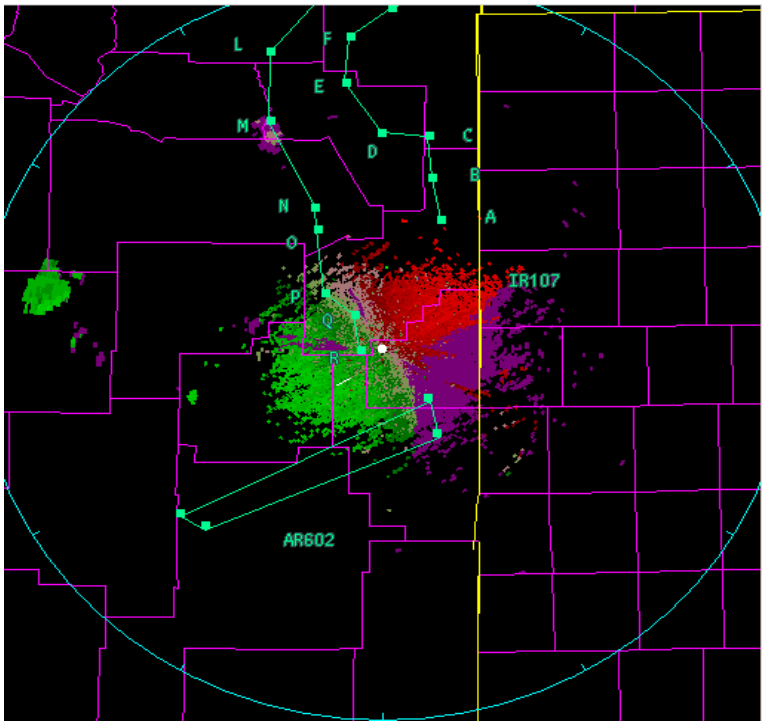


Figure 4-7. Product Display Area

The product manipulation (selection) menu (Figure 4-8), which governs such functions as zoom factor, background map and overlay selection, etc., is accessed by **right** clicking within the product display area.

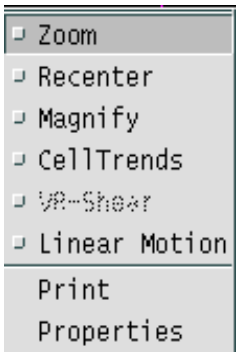


Figure 4-8. Product Manipulation Menu

See Section 4.5 for detailed explanations of the product manipulation functions available via this menu.

4.3.3.4 Color Bar Legend Area. The color level bar (Figure 4-9) and data level values for the displayed product, if applicable, are displayed vertically along the Product Display Area left side.

Figure 4-9. Color Bar Legend Area

The display manipulation controls, blink/unblink and filter/unfilter, are accessed by **right** clicking on the data level color bar on the product display window left side (Figure 4-10).

Figure 4-10. Display Manipulation Controls Menu

The data value at the cursor location is indicated in the color bar by a white box surrounding the appropriate color value in the color bar. The indicated color value is updated as the cursor is moved.

4.3.3.5 Cursor Information Area. The Cursor Information Area (see Figure 4-11) is located at the bottom of the display window, beneath the Product Display Area

Figure 4-11. Cursor Information Area

The following cursor information is displayed in the Cursor Information Area:

Lat/Lon - the cursor location (in latitude/longitude) is displayed in the cursor information area at the bottom of the display and is updated as the cursor is moved. (Note that the current product lat/lon is determined by the RPG.)

Center beam height (only available on single elevation products) - The beam height center in kft MSL. This height estimate updates as the cursor is moved. This calculated height assumes standard beam propagation.

Azimuth/Range from the RDA - the cursor location (in azimuth and range (nautical miles)) relative to the RDA location is displayed in the cursor information area at the bottom of the display. This azimuth and range readout is updated as the cursor is moved.

Azimuth/Range from the Operator-Defined Home location - the cursor location (in azimuth and range (nautical miles)) relative to an operator specified origin (home) is displayed in the cursor information area at the bottom of the product display window. This home-relative azimuth and range is updated as the cursor is moved. Activating the Cursor Home function is done through a drop-down menu accessed by selecting the **right** mouse button while the cursor is positioned over the Cursor Information Area. For step-by-step procedures, see paragraph 4.6.3.21.

Vr/Shear - the resultant calculations from the Vr/Shear function are displayed on the left side of the cursor information area. The entries include rotational velocity (Vr), tangential shear (Shear), range of the operator selected couplet (Ran), and the distance between the operator selected points delineating the couplet (Dia).

Linear Motion - the resultant speed and direction calculations used to plot the graphical linear motion extrapolation (displayed in the same location as Vr/Shear and not shown in Figure 4-11).

4.3.3.6 Toolbox. The Toolbox dialog box (Figure 4-12) is automatically opened (launched) with the Product Display GUI startup. This toolbox hosts the server processor clock, window configuration control, alert registration, link cursor and background map version control, printer selection, auto dial and background map version status and the **Exit** arrow for the Product Display GUI.

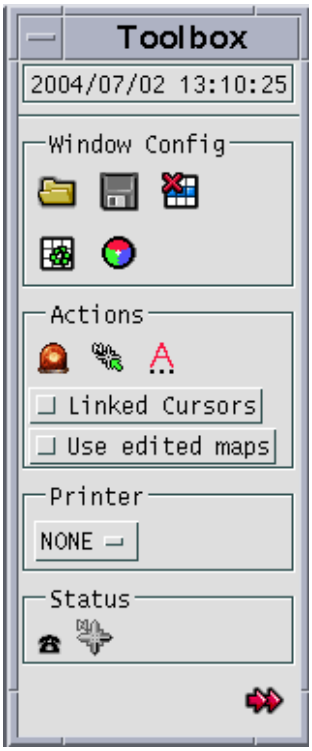


Figure 4-12. Toolbox

4.3.3.6.1 OPUP Server Clock. The clock displays the OPUP Server processor clock in Universal Coordinated Time (UTC). This time is neither the product time (assigned by the RDA) nor the workstation clock time. It is the OPUP Server processor clock time. That being said, this time should be routinely checked against the official time hack source and updated if required. See NWS EHB 6-537 (Large/Medium OPUP Configurations) and NWS EHB 6-538 (Small OPUP Configurations) for instructions on setting the server clock time.

4.3.3.6.2 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process are de-sensitized (greyed-out in appearance). Toolbox icon explanations/definitions are provided below;

Load Window Configuration

Provides the capability to choose the display window layout (size and location product automatically displayed for each display window) from predefined list of configurations.

Save Window Configuration

Saves the current display window configuration to a file. The file can be named using any combination of letters and numbers (up to 256 characters). NOTE: Special characters (e.g., #, %, etc.) are not allowed in the file name. This file is added to the Load window Configuration file listing for later use.

Delete Window Configuration

Allows the user to deleted a saved window configuration file.

Reset Window Configuration

Resets the display window configuration to the default configuration (12 display windows in a 4 by 3 window grid).

Load Color Configuration

Allows the user to specify the product display color pallet from a predefined list of available color pallets. For information on defining color pallets see Section 9.7.

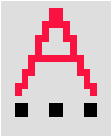
Specify Interested Alerts

Selection of this icon launches the Alert Registration Control Dialog box. See paragraph 4.3.3.6.3 for details on registering for specific alerts.

Reload Cached Maps

Selecting this button will “read” all edited maps and redraw the product display GUI to display those maps. All background maps are “read” when the Product Display GUI is opened. Newly edited maps are not updated unless this button is selected or the Product Display GUI is closed and reopened. See **Status (Edited Maps)**, below.

Alert Acknowledge Dialog

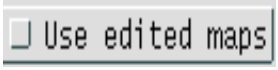


Selection of this icon launches the Active Alert Acknowledgement Dialog. See paragraph 5.2.7.3 for details. The **Alert Acknowledge Dialog** icon background turns red if the `Acknowledgement Dialog` window is dismissed while still containing unacknowledged alert messages.

Linked Cursors

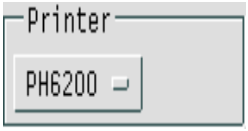
This button toggles on/off the linked cursor function. When on (active) all displayed cursors will track geographically (over the same geographic point on products that share territorial coverage regardless of host radar or products zoom factor). When off all only a single cursor is available.

Use Edited Maps



This button toggles on/off the edited maps selection. When active (on) edited maps (when available for the site) are displayed on the Product Display GUI. When off the default maps are displayed.

Printer



This selection identifies the current target printer and also allows the operator to select a new target printer from a list of installed/available (Lan) printers. Adding/Deleting printer and modifying printer drivers are all OPUP Administrative tasks accomplished via the OPUP Admin Tool GUI. See NWS EHB 6-537 (Large/Medium OPUP Configurations) and NWS EHB 6-538 (Small OPUP Configurations) for additional information.

Status (Auto-dial)

The current Auto-Dial function status. When active the OPUP is actively requesting products (via dial comms) as determined by the Auto-Dial GUI.

Status (Edited Maps))

This icon indicated whether or not there are any new edited maps available for display. All background maps are “read” when the Product Display GUI is opened. This indicator notifies the operator that a modified map is available.

Exit

Closes the Product Display GUI

4.3.3.6.3 Alert Registration. Selection of the Specify Interested Alerts icon launches the Alert Registration control dialog box (Figure 4-13) which provides the interface for registering for individual alerts of interest. When this dialog box is displayed, all the available alerts for a particular RPG are presented in the alert registration table. The alert registration table provides the host RPGID (RPG), Alert Area number (Area), Group, Category, threshold value including units (Threshold), and the Alert Paired Product (PairProd) status for each available alert.

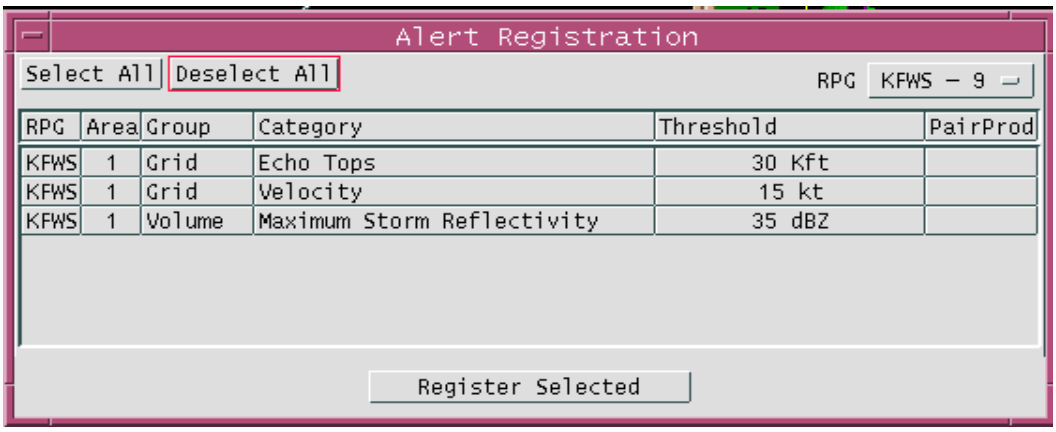


Figure 4-13. Alert Registration Control Dialog Box

The workstation operator uses the functionality provided by this dialog box to select the individual alert(s) for local notification. Individual alerts that are currently selected (registered for) are denoted with a black background.

There are four buttons presented on the Alert Registration control dialog box:

- RPG - when selected, this button provides a listing of all associated RPGs (along with their specific communications link number, e.g., KJOE - 12, etc.) from which meteorological alerts may be requested. The label for this button is the four letter ICAO identifier of the selected RPG. The alerts listed in the alert registration table are the alerts for this RPG.
- Select All - when selected, the button registers (selects) all listed alerts for this workstation.
- Deselect All - this button deregisters (deselects) all listed alerts.
- Register Selected - this button registers the selected alerts with the OPUP Alerting function and closes the Alert Registration control dialog box.

Besides the Select All and Deselect All, you may register for an individual alert, by placing the cursor on the alert definition and clicking. Any alert definition(s) previously selected will remain selected and the new alert definition will also be selected (denoted with a black background). Clicking the mouse over a previously selected alert definition will deselect (unregister) the alert. Additionally, depressing and holding down the **<Shift>** key while clicking on two alerts will select those two alerts and all the alerts that fall between the selected ones.

Section 4.4. PRODUCT DISPLAY PROCEDURES

The following procedures assume the Product Display GUI is active on the OPUP workstation. If the Product Display GUI is not running, select the Product Display icon located on the Front Panel of the OPUP workstation. For an explanation of the options available when specifying individual product parameters for display, refer to paragraph 4.3.3.1.3.1.

4.4.1 Display a Product from the OPUP Database.

The following two procedures are used for displaying products that are already available in the OPUP database.

4.4.1.1 Display the Current Product.

1. Position the cursor in any display window. Click on the **Product Selection Bar** in the Product Info Area.
2. Click on the **Category** button. This action displays the drop-down product list box.
3. Click on the desired product in the drop-down product list box.
4. Specify desired product parameters (to include elevation and resolution, if applicable) and RPG ID and select **Apply** with the mouse. If available in the data base, the specified product will display in the target display window. If the product is not available, an informational popup dialog box will be displayed.

4.4.1.2 Search the Data Base for a Specific Product.

1. Position the cursor in any display window. Click on the **Product Selection Bar** in the Product Info Area.
2. Click on the **Category** button. This action displays the drop-down product list box.
3. Click on the desired product in the drop-down product list box.
4. Specify desired product parameters (to include elevation and resolution, if applicable) and RPG ID and select **Search** with the mouse.

If available in the data base, a chronological listing of the specified product will be displayed in a scrollable list box.

5. **Double-click** on the date/time for the desired product in the product list box. The specified product will display in the target display window.

4.4.2 One-Time Request (OTR) Procedures.

For an explanation of the available options when defining an OTR, refer to paragraph 4.3.3.1.3.1.9.

4.4.2.1 One-Time Request from an Associated RPG.

1. Position the cursor in any display window. Click on the **Product Selection Bar** in the Product Info Area.
2. Ensure the RPG Type specified is `Dedicated`. If it is, then proceed to Step 3. If it is not, click on the **RPG Type** option button. This action displays the RPG Type options list. Click on the word `Dedicated`. The RPG list box is now populated with the IDs of all the associated RPGs.
3. Note the currently selected RPG ID. Click on that **RPG ID**. This action displays a listing of all dedicated (associated) RPGs. Click on the desired **RPG ID**. The selected RPG ID is now displayed as the current RPG.
4. Click on the **Category** button. This action displays the drop-down product list box.
5. Click on the desired product in the drop-down product list box.
6. Specify the desired product parameters (viz., elevation and resolution, if applicable) and select **OTR** with the mouse. The `PDOTRDialog` box is displayed.
7. Modify the specific OTR parameters as appropriate and select either **Send** or **Send/Clear** with the mouse. The OPUP applications software formats and sends an OTR message to the selected RPG.

NOTE

If the **Send/Clear** button is selected, the OPUP will send the request to the appropriate RPG, clear the originating product display window and register for the product receipt message for that product. When the product is received, it will be automatically displayed in the originating (now clear) window.

4.4.2.2 One-Time Request for a Customized Product from an Associated RPG.

NOTE

For products that require the definition of a center point (e.g., SRR, WER, SWR, etc.) or end points (viz., cross sections), the last location (az/ran) or two locations selected using the mouse prior to starting this procedure are used.

Geographic points are selected by clicking on the desired location.

1. For the appropriate parent display window, click on the **Product Selection Bar** in the Product Info Area.
2. Ensure the RPG Type specified is `Dedicated`. If it is, then proceed to Step 3. If it is not, click on the **RPG Type** option button. This action displays the RPG Type options list.

Click on the word `Dedicated`. The `RPG` list box is now populated with the IDs of all the associated RPGs.

3. Note the currently selected RPG ID. Click on that **RPG ID**. This action displays a listing of all dedicated (associated) RPGs. Click on the desired **RPG ID**. The selected RPG ID is now displayed as the current RPG.
4. Click on the **Category** button. This action displays the drop-down product list box.
5. Click on the desired product in the drop-down product list box.
6. Specify the desired product parameters (viz, elevation and resolution, if applicable) and select **OTR** with the mouse. The PDOTRDialog box is displayed.
7. Modify the specific OTR parameters (e.g., storm motion, transmission priority, etc.) as appropriate and select either **Send** or **Send/Clear** with the mouse. The OPUP applications software formats and sends an OTR message to the selected RPG.

NOTE

If the **Send/Clear** button is selected, the OPUP will send the request to the appropriate RPG, clear the originating product display window and register for the product receipt message for that product. When the product is received, it will be automatically displayed in the originating (now clear) window.

4.4.2.3 <u>One-Time Request to a Nonassociated RPG (Dial Request)</u>.

1. Position the cursor in any display window. Click on the **Product Selection Bar** in the Product Info Area.
2. Click on the **RPG Type** option button. The RPG Type options (Dedicated, AOR, and All (Others)) are presented for selection. Click on the appropriate option. The RPG list box is now populated with the subset of RPG IDs that match the selected sort option.

NOTE

When a nonassociated RPG is selected (from the AOR or All (Others) lists) the selection of either Send or Send Clear automatically invokes a dial out one-time request to the selected RPG.

NOTE

To process a request to an associated RPG whose dedicated line has failed, you MUST first “Disconnect” the failed line via the Status and Control GUI (see 6.4.4.2.2Disconnect Communications Line Procedure). This action disables the router port which allows a connection via the dial module.

3. Note the currently selected RPG ID. Click on that **RPG ID**. This action displays a listing of all RPG IDs for the selected RPG Type. Click on the desired **RPG ID**. The selected RPG ID is now displayed as the current RPG.
4. Click on the **Category** button. This action displays the drop-down product list box.
5. Click on the desired product in the drop-down product list box.
6. Specify the desired product parameters (viz, elevation and resolution, if applicable) and select **OTR** with the mouse. The PDOTRDialog box is displayed.

NOTE

If the **Send/Clear** button is selected, the OPUP will send the request to the appropriate RPG, clear the originating product display window and register for the product receipt message for that product. When the product is received, it will be automatically displayed in the originating (now clear) window.

7. Modify the specific OTR parameters as appropriate and select either **Send** or **Send/Clear** with the mouse. The OPUP applications software formats and sends an OTR message to the selected RPG.

4.4.2.4 One-Time Request Via Dial Line to an Associated RPG.

Prerequisite: To process a request to an associated RPG whose dedicated line has failed, you MUST first "Disconnect" the failed line (via the Status and Control GUI, see paragraph 6.4.4.2.2Disconnect Communications Line Procedure). This action disables the router port which allows a connection via the dial module.

1. Position the cursor in any display window. Click on the **Product Selection Bar** in the Product Info Area.
2. Click on the **RPG Type** option button. The RPG Type options are presented for selection. Click on the Dedicated option. The RPG list box is now populated with the listing of Dedicated RPG IDs.

NOTE

When the dedicated communications line is disconnected (disabled), selection of either Send or Send Clear will cause the OPUP to use a dial line to obtain the requested product(s).

3. Note the currently selected RPG ID. Click on that **RPG ID**. This action displays a listing of all RPG IDs for the selected RPG Type. Click on the desired **RPG ID**. The selected RPG ID is now displayed as the current RPG.
4. Click on the **Category** button. This action displays the drop-down product list box.

5. Click on the desired product in the drop-down product list box.
6. Specify the desired product parameters (viz, elevation and resolution, if applicable) and select **OTR** with the mouse. The PDOTRDialog box is displayed.

NOTE

If the **Send/Clear** button is selected, the OPUP will send the request to the appropriate RPG, clear the originating product display window and register for the product receipt message for that product. When the product is received, it will be automatically displayed in the originating (now clear) window.

7. Modify the specific OTR parameters as appropriate and select either **Send** or **Send/Clear** with the mouse. The OPUP applications software formats and sends an OTR message to the selected RPG.

Section 4.5. PRODUCT MANIPULATION FUNCTIONS

The Product Display GUI provides several manipulation functions to assist the operator in data analysis and product interrogation. The subparagraphs in this section describe the various manipulation functions (Section 4.6 provides step-by-step procedures for the execution of these functions.)

4.5.1 Zoom - Changing the Product Magnification Factor.

By default, products displayed in the Product Display Area are displayed with at zoom factor of 1, centered on the RDA site. This allows the entire displayable product to be presented within the display window bounds. Although a zoom factor of 1ensures that all product data will be within the operator's view, is does limit the ability to do fine-scale interrogation. Therefore, the OPUP provides that capability to change the zoom factor and relocate the display center point. The available zoom factors are 1X, 2X, 4X, 8X, and 16X. Zoom factors are incremental; the OPUP display software processes through the zoom factors in succession.

The Zoom function combines the change in zoom factor with the Recenter function. When the Zoom function is active, the product will redraw at the next zoom factor recentered on the next geographic point selected within the product display window.

Selecting a particular cell/feature in an attributes table will set the selected cursor position coordinates to the azimuth and range indicated in the table for the selected storm/feature. This is essentially the same as selecting that storm on the product itself. By clicking the mouse (while ZOOM is active) on a storm/feature within an attribute table, an operator can quickly zoom in on the selected storm even when that storm is not currently within the display window.

For step-by-step procedures see paragraph 4.6.3.1.

4.5.2 Recenter.

The recenter mode allows the user to change the center point for the display without changing the zoom factor. Additionally, the Recenter function provides for a quick return to the default center location and zoom factor (zoom factor 1).

Selecting a particular cell/feature in an attributes table will set the selected cursor position coordinates to the azimuth and range indicated in the table for the selected storm/feature. This is essentially the same as selecting that storm on the product itself. By clicking the mouse (while RECENTER is active) on a storm/feature within an attribute table, an operator can quickly recenter the display on the desired storm even when the selected storm is not currently within the display window.

For step-by-step procedures see paragraph 4.6.3.3.

4.5.3 Magnify.

The magnify mode allows the user to increase the magnification of a smaller image portion by clicking. The magnified image portion will update as the user moves the cursor while depressing the mouse.

NOTE

> If the **<Caps Lock>** keyboard function is active the magnified window **will not** track with the mouse movements. To correct this situation, simply deactivate the Caps Lock function be pressing the **<Caps Lock>** key.

The magnified display will disappear when the mouse button is released.

For step-by-step procedures see paragraph 4.6.3.5.

4.5.4 Filter.

Graphic products with multiple data levels, i.e., a color scale, may have some or all of those levels filtered. Product levels may be filtered (turned off) in order to leave only higher intensity levels displayed on the screen. The Filter function purpose is to eliminate data associated with values of lower intensity so that data associated with values of high intensity may stand out.

When the Filter function is applied, all data levels at and below the selected color level will become transparent.

NOTE

> Below means of lesser intensity whether physically above or below the selected level on the color bar.

Note that colors are filtered by their corresponding threshold intensity levels for the particular product they represent. For such products as Velocity, which have positive and negative value colors, it is the absolute intensity value that determines the filtering. Thus, colors corresponding to weaker velocities are filtered on both the positive and negative scale portions simultaneously. In this case, either level (positive or negative) may be selected with the same filtering effect.

Subsequent selections of this function will only have an effect if the filter color level is changed from the current selection.

The Range Folded (RF) color level, where it exists, may each be filtered independently of other color levels.

For step-by-step procedures see paragraph 4.6.3.7.

4.5.5 Blink.

The Blink Color Level function is provided to enable a single color level in a displayed product to stand out from the others. The color, wherever it appears in the displayed product, as well as on the color bar, will blink.

Only one color level will blink at a time.

When a color level blinks, it will alternate between the color and black.

To select another color level when one is already blinking, simply select another color level on the color bar, then reselect the Blink function.

This function is available for main product display colors only and will not affect overlays and maps.

For step-by-step procedures see paragraph 4.6.3.8.

4.5.6 Looping Products (Time Lapse).

OPUP provides for independent looping of products in all 12 display windows. When the looping function is activated, a looping sequence using the latest 12 (default) product images that have the same product parameters (except time) as those listed in the Product Selection dialog is built. Each image undergoes the required manipulation(s) required to conform to the initial product manipulation(s) made prior to being included in the sequence. The sequence begins to display automatically as the sequence frames are built. The default display rate is 3 frames per second. The sequence will continue to loop until the operator terminates the loop or selects a manipulation function (such action automatically terminates the current looping sequence). If the Auto update function is active, the loop will add new products as received (discarding the oldest in the sequence to maintain the frame count defined by the operator).

NOTE

> Looping products requires significant memory resources. Multiple looping sequences on multiple workstations may result in poor command response and sluggish performance. Even though OPUP allows multiple looping sequences at each workstation, judicious use of multiple loops is warranted.

Products manipulation (e.g., changing the Zoom factor, etc.) while the sequence is active is not allowed. All manipulations must be completed prior to activating the Looping function. If product manipulations are required, the loop sequence will have to be rebuilt after all modifications to the product display properties are completed.

Each time the Product Display Graphical User Interface is started (launched), the looping properties for each product display window are reset to the default values of 12 images with a display rate of 3 frames per second. Once a loop sequence is defined and active, the operator may modify

the number of images and the display rate (number of frames per second) within the following limits.

	Minimum	Maximum
Number of images	12 products	72 products
Frames per second	1 frame	10 frames

Within these loop definition constraints, the following options are available for each active looping sequence:

Play Direction Toggle: Toggles the direction of play either forward or backward. If the current direction of play is forward in time, selection of this button causes the loop sequence to reverse and play backward in time (newest to oldest product). If the current direction of play is backward in time, selection of this button causes the loop sequence to reverse and play forward in time (oldest to newest product).

Play/Pause Toggle: If in the Play state, halts the looping sequence. If in a Paused state, resumes the looping sequence in the selected direction of play.

Single Frame Forward: When the loop is in a Paused state, advances the loop sequence 1 frame forward in time. Selection of this button when the loop is in the play state will immediately pause the loop sequence and advance the loop sequence 1 frame forward in time.

Single Frame Reverse: When in a Paused state, reverse the loop sequence 1 frame backward in time. Selection of this button when the loop is in the play state will immediately pause the loop sequence and reverse the loop sequence 1 frame backward in time.

NOTE

Any changes to the loop parameters number of images and frames per second (display rate) will become the default values for that display window until either they are changed again or the Product Display GUI is exited.

For step-by-step procedures see paragraph 4.6.3.9.

4.5.7 WSR-88D Algorithm Product Overlays.

WSR-88D algorithm-derived products are available as both independent products for display and as product overlays for display on other products.

In order to be overlaid onto another product, the overlay and product must be from the same RPG and their volume scan times must be within 7 minutes. There is no way to overlay products for which these two parameters are not true.

Once an overlay is selected and displayed on a product it may age off the display if the time delta between the host product and overlay exceeds 10 minutes. However, the product display window is still registered (listening) for the product/ overlay combination. When (if) a new product (or overlay) is received and the time delta is less than 10 minutes between the newest product and newest overlay the product/overlay combination will be automatically redisplayed.

Products which are also available as overlays are Hail, Mesocyclone, TVS, Storm Track Information (STI), Severe Weather Probability (SWP), Mesocyclone Rapid Update, Tornado Rapid Update, Combined Shear Contour, Echo Tops Contour, and Composite Reflectivity Contour.

The default overlay associations are determined by adaptation data (see Section 9.6).

Any combination of overlays may be displayed simultaneously. These overlays will continue to be displayed on the products through all product manipulation functions (e.g., zoom, elevation up/ down, product forward/back, auto update, etc.). The default associations are invoked each time the **Apply** button on the Product Selection Dialog (Figure 4-3) is selected.

For step-by-step procedures see paragraph 4.6.3.10.

4.5.7.1 Background Maps. Various background maps are provided to accompany the display of geographic products. Background maps may be defined to always accompany the display of a particular product type or may be added/deleted individually by the operator.

Displayed background maps will always match the particular RDA radar coverage area from which the displayed product originated. All geographic maps are locally stored in the OPUP data base and are always available.

Certain generic maps are not stored in the OPUP data base but are created whenever selected. These are: RDA (site), Range Ring, and Polar Grid. The RDA map is a single small circle at the associated RDA location. The Range Ring map is a single circle outlining the product coverage area for the currently displayed product (or at 460 km (248.4 nm) from the RDA if no product is displayed). The Polar Grid map consists of multiple concentric circles around the map center and azimuth interval spokes radiating from the map center. The interval between the concentric circles and the angle between the spokes are dependent upon the coverage area (radius) of the concurrently displayed product.

There are two Polar Grid versions. The first, regular detail, version is displayed when the display coverage is 115 km (62.1 nm) or more. It has a product dependent circle separation and a spoke separation of 30 degrees. The second, high detail, version is displayed when the display coverage is less than 115 km (62.1 nm). It has a 10 nm circle separation, a 10 degree spoke separation, and tick marks located every nautical mile along the spoke lines.

When a product is first selected for display, it will be displayed at its normal scale with the entire product covering most of the display area. The default background maps displayed with it, and any others that are added via the Map Select function, will show the same coverage area except that the map data will be clipped outside of a square bordering the product.

At this normal scale, most products will appear round within the square map area. When a product is recentered or magnified however, it will clip at the same boundaries as the maps, which, of course, will also be magnified.

When the associated product is displayed or magnified such that the coverage area diameter is less than 115 km (62.1 nm) then, in some cases, higher detail background maps than those displayed for larger coverage areas are displayed. These higher detail maps, if available, are displayed between the 62.1 nm diameter and the 8.1 nm diameter (8x magnification of a 60 km (32.4 nm) radius product) scales. These higher detail maps would normally be used for categories like Highways since they could contain more highways than the normal detail map. This is because, at 230 km (124.2 nm) diameter, the highways will be four times as far apart as at 920 km (496.7 nm) diameter, and at 15 km (8.1 nm) diameter they will be 61 times as far apart. This reduces the probability of even one highway appearing on the screen at high magnification without added data. This higher detail does not apply to maps like Counties, since all counties must appear even at low magnifications.

Any number of background maps may be displayed without restriction. There is no predefined display limit to the number of maps and/or overlays. Each background map is preassigned a color definition in adaptation data.

The pixel-by-pixel precedence of background maps, where they intersect, is determined by the order they are listed in the background maps tab listing. Maps listed higher will be displayed on top of maps listed lower on the list.

Background maps will always have display precedence over product data unless the Maps Background function is selected.

When background maps are displayed in the foreground, they will have display precedence over all main product data displayed on the selected screen. When background maps are in the background or foreground, overlay data displayed as an overlay will always have display precedence over all background map data.

All displayed background maps will be placed in the foreground or background together. It is not possible to individually switch simultaneously displayed maps.

When background maps are displayed in the background, they will have the lowest precedence on the screen and be obscured by all other data on the display. Display precedence between the maps themselves is not affected by changing them to the background.

Defined alert areas for individual RPGs may also be displayed with data from that RPG. Alert grid boxes that are selected for inclusion in Alert Area 1 are annotated with a yellow N. Alert grid boxes that are selected for inclusion in Alert Area 2 are annotated with a blue Z. Alert grid boxes that are selected for inclusion both Alert Areas are designated a half blue and half yellow X.

For step-by-step procedures addressing Background Map Control, see paragraph 4.6.3.13.

4.5.7.2 Cell Trends. The Cell Trends Display function will display a graphic representation of the trend, or history, of several meteorological parameters for an operator-selected storm cell. The current plot of each parameter and data from up to nine previous volume scans may be included, based on the data available from the RPG.

Selecting a particular cell/feature in an attributes table will set the selected cursor position coordinates to the azimuth and range indicated in the table for the selected storm/feature. This is essentially the same as selecting that storm on the product itself. With CELL TRENDS active, clicking on a storm/feature within an attribute table, selects the storm for the CELL TRENDS function, even when the selected storm is not within the display window.

This function will display a set of four graphs on an independent display window (Figure 4-14). These graphs depict the trend of the following meteorological parameters: storm top and base, maximum reflectivity height, storm cell centroid height, probability of hail, probability of severe hail, cell-based VIL, and maximum reflectivity. All of these parameters are derived by the Storm Cell Identification and Tracking (SCIT) and Hail algorithms.

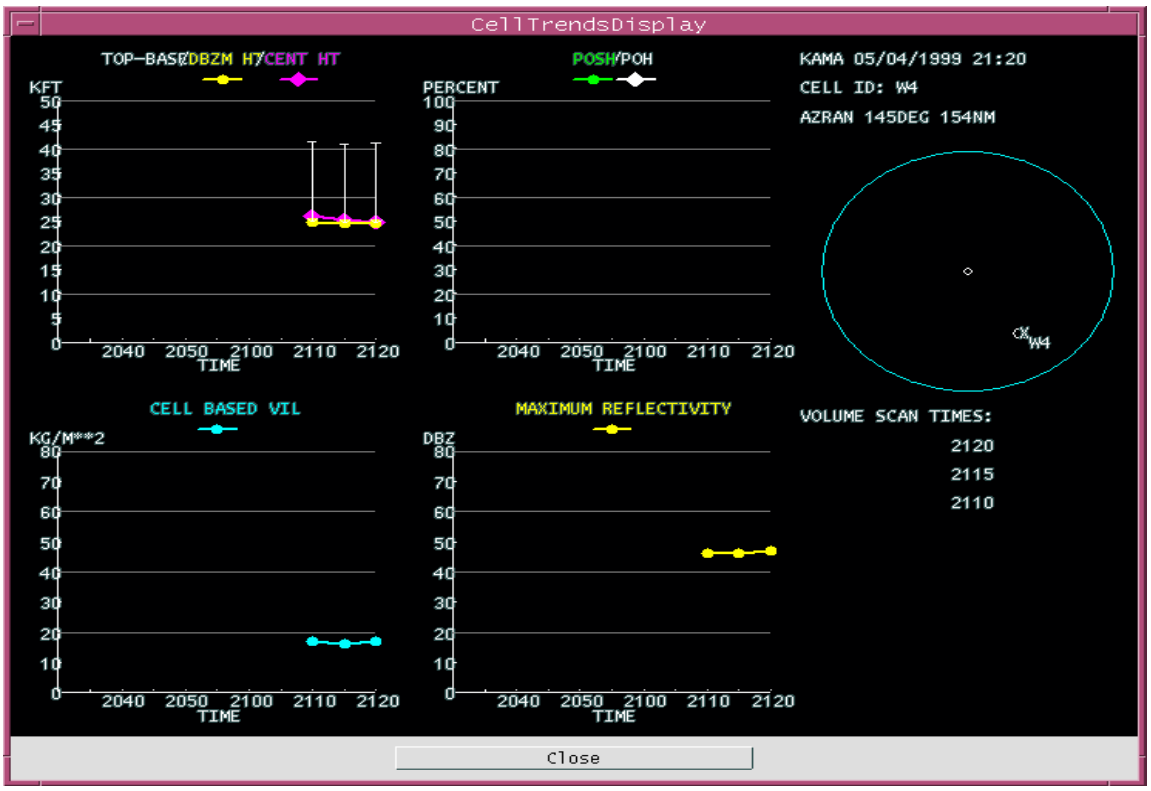


Figure 4-14. Cell Trends Display - Window

In order for this function to work properly, the following must be true:

1. The operator must first select a storm cell of interest. This is accomplished by selecting a point near a storm cell on any geographic product from the volume scan of interest. The

selected point must be within 5 nautical miles of the storm cell centroid. The storm cell centroid is identified by a circle with an 'x' in the center which is displayed as part of the Storm Track Information product and overlay. Failure to select a position within 5 nautical miles of a storm cell centroid will result in the display of this feedback message: Cell not within 5 nm.

2. The Storm Structure alphanumeric product, (product mnemonic = SS, product ID number = 62) having a volume scan time within 7 minutes of the product on which the above selection was made, must be in the OPUP data base. This is because the data used to build the cell trends display is part of the Storm Structure product. For this reason, if trend information is desired routinely, the SS product should be included on the RPS list, as well as in one-time requests to non-associated RPGs. Failure to have the needed SS product in the PUP data base will result in the display of this feedback message: Cell Trend Information Not Available.

The area on the right-hand side of the cell trends display contains the cell ID and its azimuth and range from the radar. There is also a graphical representation of the cell's location. This appears as a cyan-colored range ring with a white circle in the center that represents the RDA position. The range ring is at 248 nautical miles. The volume scan times available for the trend information are also listed. Up to 10 volume scan times may appear; the first time is always the current volume scan time. Volume scan times for which the selected storm cell existed are displayed in white. Volume scan times for which the selected storm cell was not identified by the RPG are displayed in gray.

In the cell trend graphs, the current volume scan time will always be at the right-most end of the x-axis; however, the four earlier times may not be actual volume scan times. Instead, the four earlier times are spaced at even intervals. This ensures a more accurate trend data representation. If the intervals between each volume scan time are not all the same, the times at the bottom of the x-axis will not match the volume scan times. The data points are always plotted at their corresponding volume scan time positions.

Any trend data that exceeds the maximum value along the y-axis will be truncated so that the symbol plotted appears at the maximum value position.

The cell trend display window will be destroyed whenever a new product is selected from the master display window.

The cell trend display defaults to the volume scan date and product time in the master display window (window in which the cell centroid was identified). If the storm structure product for that volume scan date and time is not available, the cell trend display will use the storm structure product from the previous volume scan date and time, if available. However, in any instance, the storm structure product volume scan date and time must be within 7 minutes of the selected product time to be valid. Failure to have the needed storm structure product in the OPUP data base will result in the display of this feedback message: Cell Trend Information Not Available.

The cell trend display window has the same auto update flag setting as the master product display window from which the cell trend was selected. When the flag is set to auto update, the cell trend display will auto update whenever a new storm structure product is received.

The following describes the four cell trend graphs:

TOP-BASE/DBZM HT/CENT HT

Y-axis: 0 to 50 thousand feet above mean sea level

X-axis: RDA clock time

Data

Plotted: TOP-BASE: Storm cell top and base are represented by a vertical white line, one pixel wide, with end points at the storm cell top and storm cell base. If the storm cell base was detected on the lowest elevation, a downward pointing arrowhead is displayed at the bottom of the line. Similarly, if the storm cell top is detected on the highest elevation, or, the top is greater than the highest value on the y-axis, an upward pointing arrowhead is displayed at the top of the line. The upward arrowhead is also used if the height of the storm cell top exceeds the maximum value along the y-axis. The dBZ value used to determine the storm cell top and base is determined by RPG adaptation data.

DBZM HT: The maximum dBZ height value within the storm cell is represented by a yellow, 4 pixel diameter circle. Adjacent circles are connected by a yellow line.

CENT HT: The storm cell centroid height is represented by a magenta diamond-shaped symbol. Adjacent symbols are connected by a magenta line.

POSH/POH

Y-axis: Probability value in percent.

X-axis: RDA clock time.

Data

Plotted: POSH: The probability of severe hail (hail diameter greater than or equal to 3/4 inch) represented by a green, 4 pixel diameter circle. Adjacent circles are connected by a green line.

POH: The probability of hail (of any size) represented by a white diamond-shaped symbol. Adjacent symbols are connected by a white line.

NOTE

The maximum processing Hail algorithm range may be less than that of the SCIT algorithm. Therefore, a storm cell may be identified by the SCIT algorithm but be located outside the Hail algorithm's processing range. In this case, no POSH or POH value will be plotted for that volume scan.

CELL BASED VIL

Y-axis: Kilograms of liquid water per square meter.

X-axis: RDA clock time.

Data

Plotted: The vertically integrated liquid water content of the selected storm cell

MAXIMUM REFLECTIVITY

Y-axis: decibels of reflectivity.

X-axis: RDA clock time.

Data

Plotted: The maximum reflectivity value detected in the selected storm cell.

For step-by-step procedures see paragraph 4.6.3.18.

4.5.7.3 VR-Shear. The Vr/Shear function provides a quick method of estimating two important, distinctly different, calculations related to strength of a rotating solid body; Rotational Velocity (Vr) and Tangential Shear (Shear).

When the Vr/Shear function is selected for display on a valid velocity-based product (Base Velocity (V), Storm Relative Mean Radial Velocity (SRM and SRR), or Severe Weather Velocity (SWV)), four parameters are calculated and presented for the operator-defined velocity couplet. These parameters are; rotational velocity, (tangential) shear, range from radar, and diameter.

- Rotational Velocity (Vr), is derived by the formula $\Delta V/2$ (change of velocity divided by 2) and provides a rotation rate estimate of a solid body.
- Tangential Shear (S), is calculated by the formula $\Delta V/D$ (change of velocity divided by distance) and is a measure of the rate of change in vector velocity normal to the beam.
- The range displayed is based on the center point of the line connecting the two selected points.
- The diameter displayed is simply the distance between the two selected points.

After selecting the Vr/Shear function, you must define the velocity couplet by selecting two points on a velocity-based product. Normally, the couplet is defined by selecting the strongest inbound velocity and the strongest outbound velocity. However, it is not required that the two selected velocity values have opposite signs. We highly recommend that this function be selected while at the highest magnification possible for the displayed product (see **NOTES** below). Once the points are selected, a line will be drawn on the screen between the two selected points.

To compute the change in velocity (ΔV), the OPUP uses the mid-range velocity value of the selected data (color) level. For example, if the color level selected is labeled 20 knots, that means the velocity represented by that color falls between 20 knots and the next higher color level, in this case let's use 30 knots. Therefore, the calculation for the change in velocity would use the mid-range value of 25 knots for that point. If the selected color level is at the upper (or lower) bound of the color bar, the value used is determined by adding (or subtracting, in the case of negative velocity values) 5 knots. For example, if the lower bound color level selected is -64 knots, the value of -69 knots would be used in the rotational velocity calculation for that point. When either an upper or lower bound value is used, the estimates for rotational velocity and tangential shear may not be as accurate as when computed using delineated velocity selections. In future builds estimates derived using upper or lower bound values will be prefixed by a greater than sign (>).

The following are the abbreviations and units for each parameter displayed in response to selecting the Vr/Shear function:

- Rotational velocity (Vr) in knots
- Tangential Shear (S) in per second
- Range from radar (RAN) in nautical miles
- Diameter (DI) in nautical miles

NOTES

It is highly recommend that the product used in association with this function be magnified as high as possible before selecting the two points. This will help ensure the accurate selection of the maximum velocity values. This is due to the fact that the same geographic pixel positions applied at 1X magnification may yield a different color value on the display when applied to the same product at 8X magnification.

In order to prevent falsely high shear values when working at long distances from the radar, the diameter value is limited to be no smaller than one beamwidth. Therefore, if you select of two points that are geographically different, yet less than one beamwidth apart, you will be prompted by an error message to reselect two points that are further apart.

The following are feedback messages and their meanings for errors that may be generated when this function is selected:

`Points must be no more than 27nm apart -` The two points selected to define the velocity couplet are too far apart. The points must be within 27 nautical miles of one another.

`Points can not contain ND or RF -` One or both of the points selected to define the velocity couplet are either in a range folded data (RF) or no data (ND) area. Velocity values are indeterminable in these areas. Reselect the points ensuring they lie in a valid velocity data region.

`Points are not the minimum distance apart. Selected distance of x.xxxx Km is less than required distance of x.xxxx Km -` The two points selected have the same geographic coordinates. Reselect the points ensuring they are spaced apart from one another.

For step-by-step procedures see paragraph 4.6.3.19.

4.5.7.4 Linear Motion. The Linear Motion function provides a one-hour forecast movement of an operator-specified phenomena using a simple linear extrapolation technique.

Upon activation, this function uses the operator selected points (two points) and product times (products must be from the same radar but from different volume scans) to extrapolate 4 forecast positions for the identified phenomena. These positions, at 15 minute intervals, and corresponding clock times are plotted as an overlay on the displayed (parent) product.

For step-by-step procedures see paragraph 4.6.3.20.

4.5.7.5 Cursor Home. The cursor location relative to an operator-selected point is provided in the Cursor Information Area of the product display window. This readout provides the current cursor location (azimuth and range in nautical miles) from an operator-selected point (home). This readout remains active until deactivated by the operator and continuously updates as the cursor is moved within the display window.

For step-by-step procedures see paragraph 4.6.3.21.

4.5.7.6 Meteorological Alert Registration. Since the Product Display GUI is the primary operator interface with OPUP, the Alert Registration control dialog box is a subordinate tool to this GUI and is automatically launched when the Product Display GUI is started.

The Alert Registration control dialog box (Figure 4-13) enables the OPUP workstation to register for only those individual alerts from specific RPG(s) that apply to the particular operator's task(s)/responsibilities using that workstation. For more information regarding the Meteorological Alerts and the OPUP Alert Function see Chapter 5.

For step-by-step procedures see paragraph 4.6.3.23.

Section 4.6. PRODUCT MANIPULATION PROCEDURES

4.6.1 Introduction.

Operator interaction with the Product Display GUI (pdgui) is exclusively via mouse selection. All product manipulation options are accessed via drop-down menu selections or dialog box options.

This section is subdivided into 18 subsections. The first 4 subsections describe and present the product display manipulation menus and dialog boxes. The next 13 subsection provide detailed procedures for exercising the display manipulation items presented in these menus and dialog boxes, while the last subsection provides instructions detailing how to register for specific meteorological alerts. The specific paragraphs, numbers, and titles are presented below.

4.6.2.1 Product Display Manipulation Menu (Zoom, Recenter, etc.).

4.6.2.2 Print.

4.6.2.3 Window Properties (Background Map, Overlays, and Loop) Control Dialog Boxes.

4.6.2.4 Color Pallet Manipulation Menu.

4.6.2.5 Cursor Home Control Menu.

4.6.3.1 Zoom - Activate Zoom Function.

4.6.3.3 Recenter - Activate Recenter Function.

4.6.3.5 Magnify - Activate Magnify Function. (Activates a user-controllable magnifying glass over the product data).

4.6.3.7 Filter/Unfilter. (Turns the selected data level transparent and restores display)

4.6.3.8 Blink/Unblink. (Alternately toggles the selected color transparent and opaque)

4.6.3.9 Looping.

4.6.3.10 Product Overlay Control.

4.6.3.13 Background Map Control.

4.6.3.18 Cell Trends Display

4.6.3.19 VR-Shear.

4.6.3.20 Linear Motion.

4.6.3.21 Cursor Home

4.6.3.23 Meteorological Alert Registration.

4.6.2 Product Manipulation Menus.

All OPUP product display manipulations are activated and controlled via selections from four window-style menus. Procedures for activating the menus items are presented in paragraph 4.6.3.

4.6.2.1 Product Display Manipulation Menu (Zoom, Recenter, etc.). This menu (Figure 4-15) is accessed by positioning the cursor within the product display area and clicking the **right** mouse button.

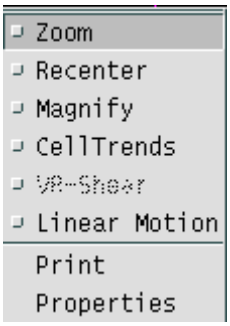


Figure 4-15. Product Display Manipulation Menu

Selection of a particular product manipulation function can be made by positioning the cursor over the checkbox for that function and clicking either the **left** or **right** mouse button.

4.6.2.2 Print. Selecting the Print option from the Product Manipulation Selection menu formats and sends a printable product image of that window to the assigned printer. (See paragraph 4.3.3.6 for information on target printer selection).

4.6.2.3 Window Properties (Background Map, Overlays, and Loop) Control Dialog Boxes. This dialog (Figure 4-16) is accessed via the Properties selection from the Product Manipulation Selection menu.

Three menus are available via clicking on the appropriate tab.

Figure 4-16. Map Tab of Window Properties Control Dialog

4.6.2.3.1 Maps. The **Maps** Tab accessed via the Properties option from the Window Properties Control Dialog, as depicted in Figure 4-16, provides display control over all background maps including the display of alerts areas. A separate Window Properties Dialog is provided for each Product display window, allowing independent display control within each window.

4.6.2.3.2 Overlay. The **Overlays** Tab (Figure 4-17) is accessed via the Properties selection from the Product Manipulation Selection menu. The **Overlays** Tab, like the **Maps** Tab, provides independent control of the displayed Algorithm output product overlay for each display window.

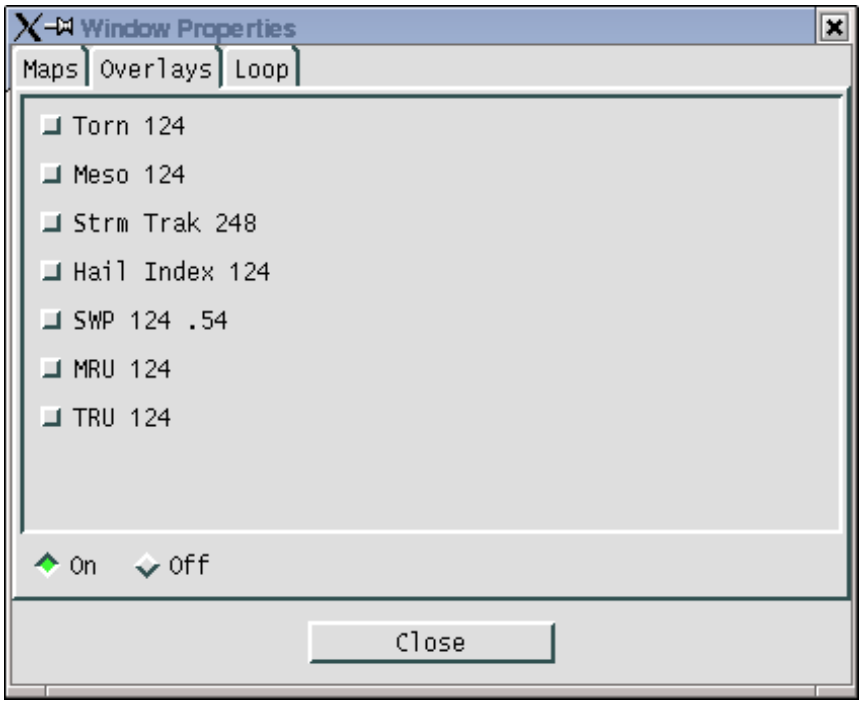


Figure 4-17. Overlays Tab

4.6.2.3.3 Loop. The **Loop** Tab (Figure 4-18) provides for the directional and speed control for each active loop. Additionally the total frame count for the loop can be changed via this dialog box.

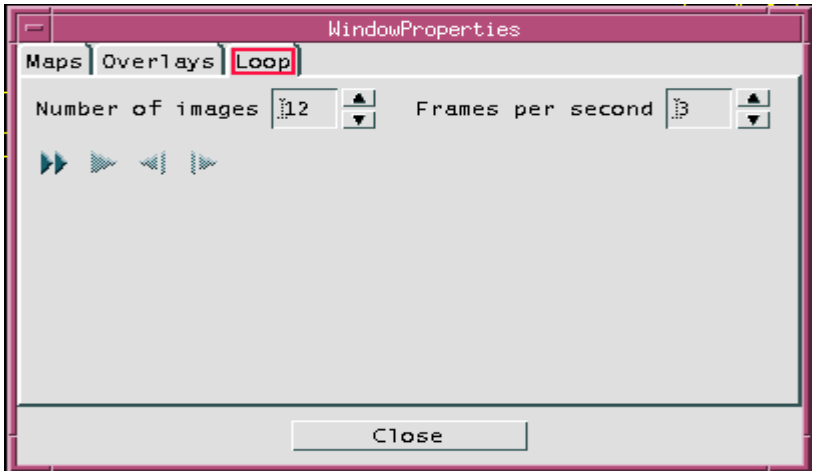


Figure 4-18. Loop Tab

4.6.2.4 Color Pallet Manipulation Menu. This menu (Figure 4-19) is accessed by **right** clicking on the **Color Bar Legend** Area.

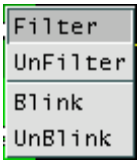


Figure 4-19. Color Pallet Manipulation Menu

4.6.2.5 Cursor Home Control Menu. The Cursor Home Control menu (Figure 4-20) is accessed by **right** clicking on the **Cursor Information** Area.

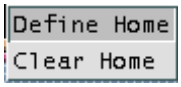


Figure 4-20. Cursor Home Control Menu

4.6.3 Procedures.

The following paragraphs provide step-by-step display manipulation procedures.

4.6.3.1 Zoom - Activate Zoom Function. Recenter product and change the zoom factor) Prerequisite: This procedure assumes a geographic product is displayed in the display window. If this is not the case, see the procedures in Section 4.4.

1. With the cursor in the product display area of a particular product display window, click the **right** button.
2. To activate the Zoom function, click on the **Zoom** selection box.
3. Click on the location of interest. The product is re-centered over selected point and magnified 2X.

Continue to click until the desired zoom factor is achieved.

To unzoom, click the **middle** mouse button.

The Zoom function will stay active for this display window until the function is turned off (see procedure 4.6.3.2Zoom - Deactivate Zoom Function.)

4.6.3.2 Zoom - Deactivate Zoom Function. Prerequisite: This procedure assumes the Zoom function is active.

1. With the cursor in the product display area of a particular product display window, click the **right** button.

2. Click on the **Zoom** selection box in the drop-down menu or activate the Recenter function. Either selection toggles off the Zoom function.

4.6.3.3 Recenter - Activate Recenter Function. Recenter product display image without changing the zoom factor) Prerequisite: This procedure assumes a geographic product is displayed in the display window. If this is not the case, see the procedures in Section 4.4.

1. **Right** click on the product display area of a particular product display window.
2. To activate the Recenter function, click on the **Recenter** selection box in the drop-down menu.
3. Click on the location of interest. The product is re-centered over selected point and the magnification remains at 1X.

To change the display center point again, click on the desired location.

To return the image to the default display properties, click the **middle** mouse button. The middle mouse button selection will cause the display window to redisplay the image using the default center location (RDA location) and zoom factor (zoom factor 1).

The Recenter function will stay active for this display window until the function is turned off.

4.6.3.4 Recenter - Deactivate Recenter Function. Prerequisite: This procedure assumes the Recenter function is active.

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Recenter** selection box in the drop-down menu or activate the Zoom function. Either selection toggles off the Recenter function.

4.6.3.5 Magnify - Activate Magnify Function. Prerequisite: This procedure assumes a geographic product is displayed in the display window. If this is not the case, see the procedures in Section 4.4.

1. With the cursor in the product display area of a product display window, click the **right** mouse button.
2. Click on the **Magnify** selection box in the drop-down menu.
3. Place the cursor over data of interest and press and hold down the mouse button. A Magnify window will display over the product data.

Move the mouse to change the position the magnification box. The magnification box tracks with the mouse movements over the area of interest.

NOTE

If the **<Caps Lock>** keyboard function is active the magnified window **WILL NOT** track with the mouse movements. To correct this situation, simply deactivate the Caps Lock function be pressing the **<Caps Lock>** key.

The Magnify window will continue to display as long as the mouse button is depressed. To remove the Magnify window from the display, simply release the mouse button.

The Magnify function will stay active for this display window until the function is turned off.

4.6.3.6 Magnify - Deactivate Magnify Function. Prerequisite: This procedure assumes the Magnify function is active.

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Magnify** selection box in the drop-down menu to deselect the magnify function.

4.6.3.7 Filter/Unfilter. Prerequisite: This procedure assumes a color graphic product is displayed in the display window. If this is not the case, see the procedures in Section 4.4.

4.6.3.7.1 Filter. Turns the selected data level(s) transparent)

1. With the cursor in the Color Bar Legend Area of the product display window, position the cursor over the data level which will be the base level for the filter function.
2. Click the **right** mouse button.
3. Click on the **Filter** selection box in the drop-down menu.

All data levels (colors) below and including the selected data level on both the color scale bar and the displayed product are filtered (turned transparent) and are no longer visible.

NOTE

The Filter function filters the data based on the magnitude of the selected data level, not just its position in the color scale bar. In other words, all data at and below the selected magnitude is filtered. This results in both the positive and negative (corresponding magnitude) data levels on Velocity, and velocity-based products (e.g., SRM, VCS, etc.) being filtered.

4.6.3.7.2 Unfilter. Redisplays the filtered data levels in the product and color scale bar) Prerequisite: The product in the selected product display window is in the filtered state.

1. Position the cursor over the Color Bar Legend Area and click the **right** mouse button.

2. To deactivate the Filter function, click on the **Unfilter** selection box in the drop-down menu.

All the previously filtered data levels in the displayed product and color bar are returned to their original colors and brightness.

4.6.3.8 Blink/Unblink. Prerequisite: This procedure assumes a color graphic product is displayed in the display window. If this is not the case, see the procedures in Section 4.4.

4.6.3.8.1 Blink. Alternately toggles the selected color transparent and opaque)

1. With the cursor in the Color Bar Legend Area of the product display window, position the cursor over the data level to be affected by the Blink function.
2. Click the **right** mouse button.
3. Click on the **Blink** selection box in the drop-down menu.

The selected color level on the displayed product blinks (alternately displayed as transparent (black) and the original color), while the selected color cell in the color scale bar becomes half transparent (black) while the other half remains the original color.

4.6.3.8.2 Unblink. Turns off the Blink function) Prerequisite: This procedure assumes a color graphic product is displayed in the display window and that the Blink function is active.

1. **Right** click in the Color Bar Legend Area of the product display window.
2. Click on the **Unblink** selection box in the drop-down menu.

The blinking stops and the displayed product and color bar are returned to their original color and brightness.

4.6.3.9 Looping. Prerequisite: This procedure assumes the product of interest is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

4.6.3.9.1 Loop - Building and Displaying a Time Sequence of Products.

1. Perform any desired manipulation (Zoom, Recenter, add Background Maps, etc.) of the displayed product.

NOTE

Products manipulation while the sequence is active is not allowed. All manipulations must be completed prior to activating the Looping function.

2. Click on the **[L]** icon in the Product Legend Area.

The looping sequence of this product type (using the number of products defined under the **Loop** Tab for this Product Display window), is built. Each image will undergo the required manipulation(s) to conform to the manipulation(s) made of the initial product. Upon completion, the sequence displays at the default display rate (at startup the default is 3 frames per second).

NOTE

> Looping products requires significant memory resources. Multiple looping sequences on multiple workstations may result in poor command response and sluggish performance. Even though OPUP allows multiple looping sequences at each workstation, judicious use of multiple loops is warranted.

To deactivate the looping sequence, click the **[L]** icon again or select a product manipulation function. This action removes the sequence from memory.

4.6.3.9.2 Loop - Forward Play and Reverse Play. Prerequisite: This procedure assumes a looping sequence is active in the selected display window. If this is not the case, see the procedure (4.6.3.9.1) above to activate a Looping sequence.

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Loop** Tab. The Loop Control dialog box is displayed.
4. Invoke the desired direction of play by clicking on the appropriate VCR-type button icon.

The loop sequence immediately begins to cycle through the images in the selected direction of play.

To again change the direction of play, repeat Step 4.

4.6.3.9.3 Loop - Pause, Single Frame Forward / Backward and Resume Play. Prerequisite: This procedure assumes a looping sequence is active in the selected display window. If this is not the case, see the procedure (4.6.3.9.1Loop - Building and Displaying a Time Sequence of Products.) above to activate a Looping sequence.

1. With the cursor in the product display area of the looping product display window, click the **right** mouse button. The Product Manipulation Selection menu displays.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Loop** Tab. The **Loop Control** tab is displayed. Select any of the following looping options:

- Pause. To **Pause** the Looping sequence click on the VCR-type icon. The loop sequence will stop and remain in the paused state until another loop control selection is made or the product is replaced with a different product.
- Single Frame Forward. To advance through the loop by a single frame, click on the VCR-type icon. The loop sequence will step forward in time by a single product frame. Additional selections of this icon will continue to advance the loop one frame per selection through the sequence. All other looping options are available.
- Single Frame Backward. To step backward in time by a single frame, click on the VCR-type icon. The loop sequence will step backward in time by a single product frame. Additional selections of this icon will continue to step back in time one frame per selection through the sequence. All other looping options are available.
- Resume Play. From the Paused state, selection of the PLAY VCR-type icon will cause the looping sequence to resume play.

4.6.3.10 Product Overlay Control. (Overlay selections and display options) Prerequisite: This procedure assumes a graphic product is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

4.6.3.11 Selecting Overlay for Display.

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the Properties selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Overlays** Tab. The **Overlays** selection dialog box is displayed.
4. Select the desired overlay by clicking on the overlay name (e.g., Storm Tracking, etc.). A check mark is placed in the overlay name bar in the dialog box.

As each overlay is selected, it is automatically drawn onto the displayed product. Repeating Step 4 allows you to select as many overlays as desired.

5. Click on the **Close** button to delete the dialog box.

4.6.3.12 Overlays Off/On. Alternately toggles the displayed overlays off and on)

4.6.3.12.1 Overlays Off. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window (see Section 4.4) and that at least one overlay is displayed on the product (see paragraph 4.6.3.11).

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Overlays** Tab. The **Overlays** selection dialog box is displayed.

4. Click on the **Off** radio button. This action turns all the displayed overlays off (transparent).

To redisplay the overlays, click on the **On** radio button. This action turns all displayed overlays back on.

To look at the full displayed product with the overlays off, you may delete the Overlays dialog box by selecting Close at the bottom of the box. To redisplay the Overlays dialog box to allow turning the overlays back on, follow paragraph 4.6.3.12.2.

4.6.3.12.2 Overlays On. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window and on that product at least one overlay was displayed and then toggled off.

1. **Right** click in the product display area of a particular product display window.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Overlays** Tab. The **Overlays** selection dialog box is displayed.
4. Click on the **On** radio button. This action turns all the transparent overlays back on.
5. Click on the **Close** button to delete the dialog box.

4.6.3.13 Background Map Control. (Background Map selection and display options) All Background Map Control functions are available on the **Maps** Tab accessed through the Window Properties Dialog box. The **Maps** Tab provides a listing of all available background maps, as well as the Foreground/Background and Off/On control buttons.

4.6.3.14 Selecting Background Map(s) for Display. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Ensure the **Maps** Tab is displayed. If not, click on the **Maps** Tab.
4. Select the desired map by clicking on the map name (e.g., Airports, etc.). A check mark is place in the map name bar in the dialog box.

As each map is selected it is automatically drawn onto the displayed product. Repeating Step 4 allows you to select as may maps as desired.

5. Click on the **Close** button to delete the dialog box.

By default all background maps are displayed over the product data (maps have a higher pixel precedence). To change the pixel precedence (put maps in the background) follow the Maps Background procedure below.

4.6.3.15 Display Alert Areas. Prerequisite: This procedure assumes a graphic product from an associated RPG is displayed in the selected display window (see Section 4.4).

1. With the cursor in the product display area of the particular product display window, click the **right** mouse button.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Ensure the **Maps** Tab is displayed. If not, click on the **Maps** Tab. The Maps selection dialog box is displayed.
4. Click on the check box for either Alert Area 1 or Alert Area 2. The selected Alert Area definition is displayed (see Section 5.4 for more information).

NOTES

Both Alert Areas may be displayed simultaneously by repeating Step 4 and selecting the other Alert Area check box.

To turn off an Alert Area, click on the check box for specific alert area.

5. To place the alert areas in the background (below the data) click on the **Background** radio button. This action toggles the pixel precedence between the maps, including alert areas) and product data so that the product data appears in the foreground and the map(s) appear(s) in the background.
6. Click on the **Close** button to delete the Maps dialog box.

4.6.3.16 Maps Background/Foreground. By default, all background maps are displayed over the product data (maps have a higher pixel precedence than does the data). To change the pixel precedence (put maps in the background/foreground) follow the procedures below.

4.6.3.16.1 Maps Background. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window (see Section 4.4) and that at least one Background Map is displayed on the product (see paragraph 4.6.3.14).

1. **Right** click in the product display area of a particular product display window.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Ensure the **Maps** Tab is displayed. If not, click on the **Maps** Tab. The **Maps** selection dialog box is displayed.

4. Click on the **Background** radio button. This action toggles the pixel precedence between the maps and product data so that the product data appears in the foreground and the map(s) appear(s) in the background.
5. Click on the **Close** button to delete the Maps dialog box.

4.6.3.16.2 Maps Foreground. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window and, on that product, at least one background map was toggled to the background.

1. **Right** click in the product display area of a particular product display window.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Ensure the **Maps** Tab is displayed. If not, click on the **Maps** Tab. The **Maps** selection dialog box is displayed.
4. Click on the **Foreground** radio button. This action toggles the pixel precedence between the maps and product data so that the map(s) appears in the foreground and the product data appears in the background.
5. Click on the **Close** button to delete the Maps dialog box.

4.6.3.17 Maps Off/On. Alternately toggles the displayed maps off and on)

4.6.3.17.1 Maps Off. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window (see Section 4.4) and that at least one background map is displayed on the product (see paragraph 4.6.3.14).

1. With the cursor in the product display area of a particular product display window, click the **right** mouse button.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Ensure the **Maps** Tab is displayed. If not, click on the **Maps** Tab. The **Maps** selection dialog box is displayed.
4. Click on the **Off** radio button. This action turns all the displayed maps off (transparent).

To redisplay the maps, click on the **On** radio button. This action turns all displayed maps back on.

To look at the full displayed product with the maps off, delete the Maps dialog box by selecting Close at the bottom of the box. To redisplay the Maps dialog box to allow turning the maps back, on follow paragraph 4.6.3.17.2.

4.6.3.17.2 Maps On. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window and on that product at least one background map was displayed and toggled off.

1. **Right** click in the product display area of a particular product display window.
2. Click on the **Properties** selection box in the drop-down menu. The Window Properties Dialog box appears.
3. Click on the **Maps** Tab. The **Maps** selection dialog box is displayed.
4. Click on the **On** radio button. This action turns all the transparent maps back on.
5. Click on the **Close** button to delete the Maps dialog box.

4.6.3.18 Cell Trends Display. See paragraph 4.5.7.2 for an explanation of the Cell Trends product. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

1. **Right** click in the product display area of a particular product display window.
2. Click on the **Cell Trends** selection box in the drop-down menu. The Cell Trends Selection Mode is enabled and the drop-down menu disappears.
3. Click on the cell of interest. The Cell Trends Display window appears.

One of three possible results are displayed:

- The Cell Trends data for the selected storm are displayed.
- The message `Cell Trend Information Not Available` is displayed.
  - This message indicates the data to produce the Cell Trends display is not currently available in the OPUP data base. You may request the Storm Structure (SS) product via OTR and after its receipt, repeat Steps 1 through 3. For long term access to Cell Trends data, ensure the SS product is added to the RPS list for the RPG of interest.
- The message `Cell not within 5 nm` is displayed.
  - Display the Storm Tracking Information overlay on the product of interest. You may want to zoom the image to make cell selection easier. Repeat Steps 1 through 3, ensuring the selected point is within 5 nm of the identified centroid location.

The cell trend display window has the same auto update flag setting as the master product display window from which the cell trend was selected. When the flag is set to auto update, the cell trend display will automatically update whenever a new Storm Structure (SS) product is received as long as the particular storm is still identified by the SCIT algorithm. If the selected storm ID is

NOT included in the SS product (identified by the SCIT algorithm) the Cell Trend Product will not update the Cell Trend data, but will display the message `Cell ID not found`.

4.6.3.19 VR-Shear. Provides the calculated values for Rotational Velocity and Tangential Shear for the operator-specified velocity couplet) Prerequisite: This procedure requires that a graphic, 16 data-level, velocity-based product (viz., Base velocity, Storm Relative (Mean Radial) Velocity Map or Region, or Severe Weather Velocity), is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

NOTE

It is highly recommend that the product used in association with this function be magnified as high as possible before selecting the two points. This will help ensure the accurate selection of the maximum velocity values. This is due to the fact that the same geographic pixel positions applied at 1X magnification may yield a different color value on the display when applied to the same product at 8X magnification.

1. **Right** click in the product display area of a particular product display window.
2. Click on the **VR-Shear** selection box in the drop-down menu. The VR-Shear Mode is enabled and the drop-down menu disappears.
3. Click on the velocity couplet of interest.

The four parameters defined below are calculated and displayed in the Cursor Information Area for the operator-defined velocity couplet. These parameters are;

- Rotational Velocity (Vr). Vr is derived by the formula $\Delta V/2$ (change of velocity divided by 2) and provides an rate of rotation estimate of a solid body.
- Tangential Shear (S). S is calculated by the formula $\Delta V/D$ (change of velocity divided by distance) and is a rate of change measure in vector velocity normal to the beam.
- Range (Ran). Ran is based on the line center point connecting the two selected points.
- Diameter (Di). Di is simply the distance between the two selected points (see NOTE:).

NOTE

In order to prevent falsely high shear values when working at long distances from the radar, the diameter value is limited to be no smaller than one beamwidth. Therefore, if you select of two points that are geographically different, yet less than one beamwidth apart, the following error message is displayed:

```
Points are not the minimum distance apart. Selected
distance of x.xxxx Km is less than required distance of
x.xxxx Km
```

Reselect the points ensuring they are spaced apart from one another.

4.6.3.20 Linear Motion. Provides a linear extrapolated forecast positions for the operator selected phenomena. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

NOTE

The Linear Motion function uses the two operator selected points (one point each on two products from different volume scans (products must be from the same radar but from different volume scans)) to extrapolate four forecast positions for the identified phenomena. Therefore, it is recommended that the first point be selected on the oldest product and the second point be selected on the newest product. This will result in the extrapolated forecast positions displaying on the most recent product.

1. Display a product from one or more volume scans ago (See NOTE: above). This may be accomplished in many ways but the easiest may be to simply select the **Left Arrow** (Product Back) located in the upper right portion of the Product Display window frame until the desired product (volume scan time) is displayed.
2. **Right** click in the product display area of a particular product display window.
3. Click on the **Linear Motion** selection box in the drop-down menu. The Linear Motion Mode is enabled and the drop-down menu disappears.
4. Click on the cell (or phenomena) of interest. This marks the location and notes the product date/time.
5. Forward the displayed product to a more recent time by clicking on the **Right Arrow** (Product Forward) icon located in the upper right portion of the Product Display window frame until the desired product (volume scan time) is displayed.
6. Click on the new position of the same cell (or phenomena) selected in Step 4. This marks the new location and date/time to complete the input for the Linear Motion extrapolation function.

The Linear Motion function will display the extrapolated positions based on the two selected cursor positions. The display will indicate the past location (location selected in Step 4) with the letter P, the current location (location selected in Step 6) with the letter C, and four estimated future locations in 15 minute intervals. The future locations are labeled with their appropriate clock time.

NOTE

One factor could have a significant effect on the linear motion estimate. That is the time interval of the two products used for selection of the past and current loca-

tions. Assuming the feature has true linear motion, the smaller the time interval between the two products, the greater the error is likely to be when it is extrapolated out to a 60 minute future position. Therefore, whenever possible, use products that are more than one volume scan apart in time.

4.6.3.21 Cursor Home. Produces an Azimuth and Range readout from a user-defined point to the cursor location.

4.6.3.21.1 Define (Cursor) Home. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window. If this is not the case, see the procedures in Section 4.4.

1. Position the cursor over the **Cursor Information Area** (along the bottom of the display window under the Product Display Area).
2. **Right** click and the Cursor Define drop-down displays.
3. Click on **Define Home** and the Cursor Home Define function is enabled and the drop-down disappears.
4. Click on the point to define as home. A yellow X is placed at this location (home) for reference. The selected point will be the origin of the azimuth and range readout.

A new readout `Home a/r` now appears in the **Cursor Information Area**. As the cursor moves within the Product Display Area, both cursor location readouts (a/r Home and a/r RDA) update with the current cursor location relative to the origin (Home and RDA, respectively).

4.6.3.22 Clear Home. Prerequisite: This procedure assumes a graphic product is displayed in the selected display window and a Home location has been previously defined (see the procedures in paragraph 4.6.3.21.1).

1. Position the cursor over the **Cursor Information Area** (along the bottom of the display window under the Product Display Area).
2. **Right** click and the Cursor Define drop-down displays.
3. Click on **Clear Home** and the Cursor Home Define function is disabled and the drop-down disappears.

The Home a/r cursor location readout disappears.

4.6.3.23 Meteorological Alert Registration. Registering for specific meteorological alerts) Prerequisite: This procedure assumes that alerts have been requested for the RPG(s) of interest via the Alert Requests GUI. If this is not the case, see the procedures in paragraph 5.4.3.

Additionally, since the Alert Registration control dialog box is a subordinate tool to the Product Display GUI, the Product Display GUI must be active to perform the following procedure.

1. Click on the **Alerts** button on the Toolbox affiliated with the Product Display GUI. The Alert Registration control dialog box displays.
2. Click on the **RPG** list box. A drop-down selection box containing a list of all your associated RPGs (along with their unique communications link number) is displayed.
3. Click on the RPG ID of interest. The Alert Registration Table is populated with a listing of the requested alerts (see Section 5.4 for additional information) for the selected RPG.
4. Click on the desired alert criteria definition. This new alert definition is now selected (denoted with a black background). Any alert definition(s) previously selected will remain selected. Repeat the process until all desired alert criteria is selected (denoted with a black background).

NOTE

Clicking the mouse over a previously selected alert definition will deselect (unregister) that alert.

5. When all desired alert definitions are selected for this RPG you may register for alerts from a different RPG by repeating Steps 2 through 4. When all desired alerts for each RPG of interest have been selected, proceed to Step 6.
6. When all desired alerts for each RPG of interest have been selected, click on the **Register Selected** button. This action registers this workstation for the selected alerts and closes the Alert Registration control dialog box.

CHAPTER 5
OPUP METEOROLOGIAL ALERT PROCESSING

Section 5.1. INTRODUCTION

5.1.1 General.

Chapter 5 provides an overview of the WSR-88D Meteorological Alert feature. Additionally, Chapter 5 provides an explanation of the OPUP Alerting functionality and detailed procedures for managing the alert processing functions in OPUP.

5.1.2 Chapter Organization.

Chapter 5 is organized into four sections as follows:

- Section 5.1. INTRODUCTION - Provides a brief description of each section found in Chapter 5.
- Section 5.2. WSR-88D METEOROLOGICAL ALERT FEATURE - Provides a brief overview of the WSR-88D alert feature.
- Section 5.3. ALERT REQUEST GUI INTERFACE - Outlines general guidance on operator interaction with the GUI interface. Additionally, this section provides specific definitions for the Alert Request interface icons and buttons.
- Section 5.4. OPUP ALERT PROCEDURES - Provides step-by-step procedures to add, modify and delete alert category definitions and modify area definitions.

Section 5.2. WSR-88D METEOROLOGICAL ALERT FEATURE

5.2.1 Introduction.

The purpose of the alerting function is to assist in the metwatch process by drawing your attention to a particular radar when the selected radar-identified alert criteria are met or exceeded. The WSR-88D alerting function is designed to automatically search data fields and algorithm output data to identify operator-selected, radar-identified phenomena. The WSR-88D alerting function identifies phenomena selected as an alert category threshold within the area designated by any associated user (OPUP, AWIPS, etc.). When it detects that an alert category threshold has been met or exceeded within a specified area, the alerting function notifies the affected associated user(s) and, if specified, will generate and automatically distribute an alert-paired product.

Upon receipt of the alert notification message, the OPUP displays an alert banner on all OPUP display workstations that have previously registered to receive that particular alert. The alert banner specifies the radar name, alert category and actual value detected that triggered the alert notification. Additional information is available in the User Alert Message product and via the **Alert** tab on the `Status and Control` GUI window.

5.2.2 Alerting Feature.

Each associated RPG allows the OPUP to establish two geographic alert areas within the data range of that radar. For each alert area, a maximum of 10 individual alert categories (one threshold per category) may be selected. If the same category is selected for both alert areas, each category/alert area pair may have the same or different alert thresholds. The RPG will process each category/alert area pair separately and will provide alert notification for each category/alert area pair when its specific threshold is met or exceeded.

When an alert category threshold is met or exceeded within an alert area, the RPG will send an alert message describing the alert to the OPUP. Additional alert messages for the same category/alert area pair will not be sent until there has been at least one volume scan when the category threshold is not met. In other words, if one storm triggers an alert for a particular category/alert area pair, you will not receive another alert for that category/alert area pair when any other storm meets or exceeds the threshold (even if the later storm is more severe) because the alert condition has not changed. Remember, the purpose of the alerting feature is to draw your attention to the radar when operator-selected phenomena begin to occur. It is not designed to alert on every occurrence of a particular phenomena.

Upon establishing communications with an associated RPG, the RPG will send an Alert Adaptation Parameter Message to OPUP. These threshold values are displayed as the selectable category threshold values via the Alert Request GUI. In response to the receipt of the Alert Threshold message, OPUP transmits an alert request message which contains the alert area definitions and the selected alert categories and threshold values for each alert area. This process initiates the RPG alert processing for the particular associated OPUP.

Any time there is a loss of communications between the RPG and OPUP, both the RPG and OPUP will reset all active alerts to inactive. This ensures that when communications are reestablished, the alert process will be re-initiated in the same state for both the OPUP and RPG.

5.2.3 Alert Categories.

There are 21 alert categories which are subdivided into three groups based on the processing requirements of each group.

5.2.3.1 Grid Group. Alert phenomena within the Grid Group can be traced to a particular cartesian grid box. For example, a Grid VIL (GL) would meet or exceed the alert threshold in a specific grid box.

There are five alert categories in the Grid group.

- Velocity (GV)
- Composite Reflectivity (GR)
- Echo Tops (GT)
- Severe Weather Probability (GP)
- Vertically Integrated Liquid (GL)

5.2.3.2 Volume Group. Alert phenomena in the Volume Group are based on a single output produced by an algorithm and applied to a large volume of the atmosphere (e.g., a storm). The result of the algorithm analysis cannot be conveniently confined to a single grid box. For example, a Probability of Severe Hail identification means the entire storm structure is conducive to the production of large hail. It does not mean that hail is occurring or is about to occur in a particular cartesian grid box over which the storm is located. Another good example is the Velocity Azimuth Display (VAD) alert. The VAD algorithm analyzes data points from 360 degrees of a particular elevation angle to produce an estimated wind speed and direction for a particular height. This wind speed/direction answer is applied to height, even though it may not be representative of every data point used in the estimate.

There are nine alert categories in the Volume Group.

- Velocity Azimuth Display (VD)
- Maximum Expected Hail Size (VZ)
- Mesocyclone (VM)
- Tornado Vortex Signature (VS)
- Maximum Storm Reflectivity (VR)
- Probability of Hail (VH)
- Probability of Severe Hail (VA)
- Storm Top (VT)

- Maximum One Hour Precipitation (VP)

5.2.3.3 Forecast Group. Phenomena in the Forecast Group are the same as the storm-based phenomena in the Volume Group. The difference is that the Forecast Group categories are identified with storms that may not be located in an alert area, but are forecast to move into an established alert area by the Storm Track Algorithm. When a Forecast Group alert criteria is met and the associated storm is located in an alert area or is forecast to move into an alert area, an alert is generated.

There are seven categories in the Forecast Group.

- Maximum Expected Hail Size (FZ)
- Mesocyclone (FM)
- Tornado Vortex Signature (FS)
- Maximum Storm Reflectivity (FR)
- Probability of Hail (FH)
- Probability of Severe Hail (FA)
- Storm Top (FT)

5.2.4 Alert Processing Range.

All alert processing functions search the data fields out to 124 nm for each alert category except for the following nine alert categories:

- Grid Reflectivity (GR) - the composite reflectivity field is searched out to 248 nm
- Grid Velocity (GV) - the base velocity data field is only searched to 62 nm
- Volume VAD (VD) - only the lowest VWP height is used to trigger this alert
- Volume TVS (VS) - a TVS must be identified within 62 nm to trigger this alert
- Volume Max Storm Reflectivity (VR) - the storm cell must be within 186 nm
- Volume Storm Top (VT) - the storm cell must be within 186 nm
- Forecast TVS (FS) - the forecasted storm cell position containing the TVS must be within 62 nm
- Forecast Max Storm Reflectivity (FR) - the forecasted storm cell position must be within 186 nm
- Forecast Storm Top (FT) - the forecasted storm cell position must be within 186 nm.

5.2.5 Alert Thresholds.

Alert threshold values are assigned at the RPG. From these predefined threshold values, the OPUP may select one value per category/alert area pair. Individual threshold value selections should be made to augment local mission metwatch requirements.

Up to six Alert thresholds can be defined at the RPG for each alert category, except for:

- Echo Tops (GT) which allows four thresholds
- Severe Weather Probability (GP) which allows five thresholds
- Mesocyclone (VM) which allows three thresholds
- Tornado Vortex Signature (VS) which allows two thresholds
- Maximum One Hour Precipitation (VP) which allows four thresholds

5.2.6 Alert Areas.

The OPUP supports two alert area definitions (Alert Area 1 and Alert Area 2, respectively) for each associated RPG connection. An alert area definition may be one contiguous area or any number of noncontiguous, independent areas, at the OPUP operator discretion. Each alert area is treated as an autonomous entity and may partially or completely overlap the other alert area.

The total area allowed for an alert area definition is delineated by a square (approximately 500 nm on each side) centered on the RDA. The perimeter of the square encompasses the 248-nm radar coverage area (See Note). This square is subdivided into a grid of 3364 (58 boxes x 58 boxes) individual alert boxes. Each alert box covers a specific 8.6 nm x 8.6 nm (16 km x 16 km) geographic area. Individual alert areas are defined by selecting alert box(es) for inclusion within the area definition.

NOTE

The alert area editor allows alert boxes outside the radar coverage area to be included as part of an alert area definition. For example on the 45 degree radial, alert boxes are available to a range of 354 nm while the radar coverage area only extends to 248 nm. It should be noted that alerts will not be triggered in alert boxes outside the radar data coverage area. Additional range limitations for certain alerts exist (refer to paragraph 5.2.4 for more detailed information).

The selection (inclusion) of an alert box on the grid indicates that its 16 km x 16 km geographic area is to be included in the alert area definition.

The basic alert grid, when toggled on for display, appears as numerous grid boxes outlined in red. Inclusion of a box is indicated by the entire box becoming opaque red.

5.2.7 Alerting Process.

At the beginning of each volume scan, the RPG compiles a list of requested inactive alert category/threshold pairs for all associated users. Then as the data become available, the RPG searches the data and algorithm output looking for values that exceed the requested alert thresholds. When a data value is found that meets or exceeds a requested threshold value, an alert is identified for the particular associated user.

5.2.7.1 Alert Notification. Upon identification of an alert, the RPG immediately formats and sends an Alert Message to the affected user. A separate notification message is sent for each triggered alert. The Alert Message contains the following information regarding the new alert:

1. `RPG ID -` The four letter RPG ICAO identifier
2. `Volume scan date and time -` This is the volume scan date and time when the alert condition was triggered
3. `Alert Area number -` Either 1 or 2 designates the area in which the alert was triggered
4. `Alert Group -` The alert group is used with alert category (5) to identify the type of alert
5. `Alert Category -` The alert category is used with the alert group in (4) to identify the type of alert
6. `Threshold -` This is the OPUP operator-selected value (from the Alert Request Edit screen) which corresponds to a particular RPG adaptation data setting (which may vary). This value was met or exceeded within the identified alert area, causing the RPG to send the alert to the OPUP
7. `Value -` This is the actual data value found by the RPG that triggered the alert
8. `Azimuth and Range -` For grid-based alerts, these identify the center location of the alert grid box which triggered the alert. For volume and forecast group alerts, the azimuth and range is generally the location of the phenomenon being reported. The azimuth is in degrees and the range is in nautical miles. The exceptions are as follows:
   (a) An azimuth and range of 0 and 0 are used for the VAD alert
   (b) Although reported as 0 and 0, azimuth and range are not determined for the Maximum 1 Hour Rainfall Accumulation alert
9. `Storm ID -` This identifies the storm as labeled on the storm ID product (and overlay) with which the alert is associated by the RPG

5.2.7.2 Alert Registration. The Alert Registration function allows each OPUP workstation to register for only those individual alerts from specific RPG(s) that apply to the particular tasks/responsibilities of the operators using that workstation.

Alert registration is accomplished via the Alert Registration dialog associated with the Product Display GUI (see paragraph 4.6.3.23 for step-by-step alert registration instructions).

When an RPG detects the existence of any alert criteria requested by an associated OPUP, an Alert Message (AM) is sent to that OPUP. The OPUP alert function determines if any OPUP workstations have registered for the particular alert that has been detected.

- If none of the workstations have registered for notification of the identified alert, then the alert information is written to the database and no additional notification is performed.

- If, on the other hand, any OPUP workstation(s) registered for the identified alert, then the alert function appends the alert information to the database and sends the alert to (only) those registered workstations. A subset of the information contained in the AM is displayed as an Alert Banner on top of any other OPUP GUI display on the registered workstation.

The following example illustrates the Alert Registration function.

Example: In this example the OPUP is configured with a single associated RPG and only two OPUP workstations.

> The OPUP has requested 8 alerts for alert area 1 (AA1) including Grid Group: Echo Tops (GT), and 10 alerts for alert area 2 (AA2) from RPG KMAR.
>
> Of these possible 18 alerts, workstation1 (WS1) is only interested in 3 alerts from AA1 (Volume Group: TVS, MESO, and Storm Top) and 2 alerts from AA2 (Grid Group: VIL and Composite Reflectivity) and therefore has registered for only those 5 alerts.
>
> Workstation2 (WS2), metwatching a portion of the same radar (KMAR) coverage area but for different mission requirements, requires only a single alert from KMAR; AA2 (Grid Group: Composite Reflectivity). Therefore, WS2 only registered for that single alert.
>
> Upon completion of a volume scan, RPG KMAR detects that the OPUP-requested threshold for GT has been exceeded. RPG KMAR generates an AM and sends that message to the OPUP. Since neither of the workstations have registered for this alert (AA1 - GT), the alert information is stored in the database and notification is NOT forwarded to either workstation. (NOTE: All alert information received within the past 6 hours is available via the Alert Tab on the Status and Control GUI.)
>
> Later, RPG KMAR detects that the OPUP-requested threshold for Grid Group: Composite Reflectivity in AA2 has been exceeded. RPG KMAR generates an AM and sends that message to the OPUP. Since both of the workstations have registered for this alert, the alert information is stored in the database and an Alert Banner is forwarded to each workstation. An Alert Banner specifying the information for the this alert is displayed on both WS1 and WS2.
>
> At the completion of a subsequent volume scan, RPG KMAR detects a MESO in AA1. RPG KMAR generates an AM and sends that message to the OPUP. Since only WS1 had registered for the MESO alert, the alert information is stored in the database and the alert notification is forwarded **only** to WS1. An Alert Banner specifying the information for the this alert is displayed only on WS1.

Even though the OPUP will receive notification of any requested detected alert, Alert Banners are only presented on workstations that have registered for the particular alert.

5.2.7.3 Active Alert Acknowledge Dialog. The OPUP Alert function will generate an Active Alert Acknowledge Dialog for dissemination to the appropriate workstation immediately upon receipt of the alert message from an RPG. The `Active Alert Acknowledge Dialog` window (Figure 5-1) is displayed on top of any OPUP GUI(s) displayed in the active workspace. As alert messages are received, they are placed into the scroll list contained in the `Active Alert Acknowledge Dialog` window. All received alerts can be acknowledged by clicking on the **Acknowledge All** button. If one alert is selected, by clicking the alert message, and the **Acknowledge Selected** button is pressed, only the selected alert message is acknowledged. When an alert message is acknowledged, it is removed from the list in the `Active Alert Acknowledge Dialog` window and an alert acknowledgement flag is posted in the database. Only active alerts can be marked as acknowledged. To remove the `Active Alert Acknowledge Dialog` window, click the **Dismiss** button.

If the `Active Alert Acknowledge Dialog` window is dismissed, but still contains alert messages, the background of the **Alert Acknowledge Dialog** icon on the Toolbox turns red. If all alert messages are acknowledged, the background of the icon will return to its normal color.

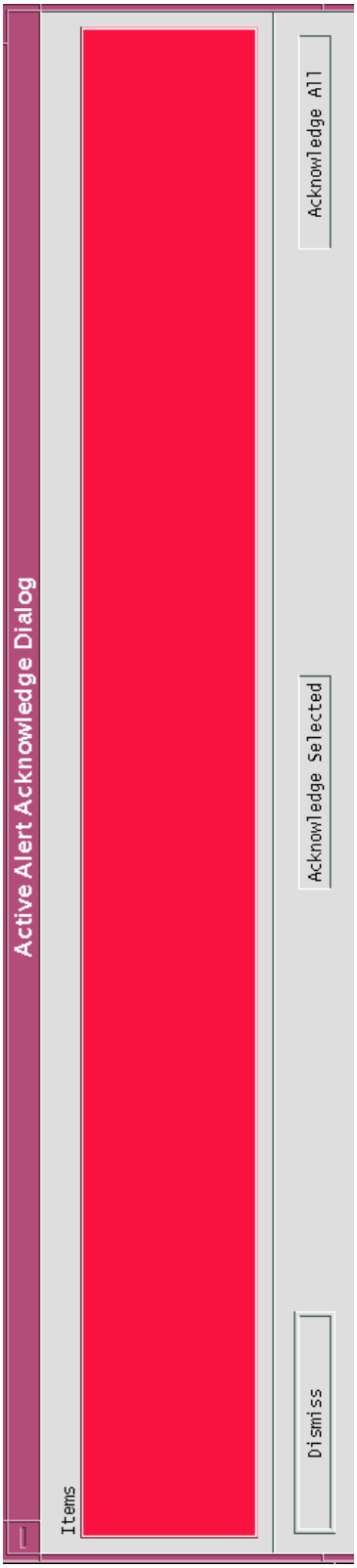


Figure 5-1. Active Alert Acknowledge Dialog

The alerts in the `Active Alert Acknowledge Dialog` window are concise and provide only the date/time (volume scan time) of occurrence, RPGID, alert area, group, category, and exceeding value. Additional information is available via the UAM or the alert message information displayed via the Alerts tab on the Status and Control GUI (see Section 6.9).

NOTE

All active alerts and alerts less than 6 hours old are maintained in the OPUP database and may be viewed via the Alerts Tab (Section 6.9) on the Status and Control GUI.

5.2.7.4 Alert-Paired Products. At the OPUP operator's discretion, the RPG will send a predetermined product when an alert is triggered. The alert-paired product type, including its parameters, is determined by the RPG; the OPUP operator only selects whether or not to receive it when an alert is detected.

5.2.7.5 User Alert Message. At the end of each volume scan, the RPG formats and sends a User Alert Message (UAM) to each associated user summarizing all new alerts found for that user during the previous volume scan. The UAM provides the following information for each new alert:

1. `RPG ID -` The four letter RPG ICAO identifier
2. `Volume scan date and time -` This is the volume scan date and time when the alert condition was triggered
3. `Alert Area number -` Either 1 or 2 designates the area in which the alert was triggered
4. `Alert Group -` The alert group is used with alert category (5) to identify the type of alert
5. `Alert Category -` The alert category is used with the alert group in (3) to identify the type of alert
6. `Threshold -` This is the OPUP operator-selected value (from the Alert Request Edit screen) which corresponds to a particular RPG adaptation data setting (which may vary). This value was met or exceeded within the identified alert area, causing the RPG to send the alert to the OPUP
7. `Value -` This is the actual data value found by the RPG that triggered the alert
8. `Azimuth and Range -` For grid-based alerts, these identify the center location of the alert grid box which triggered the alert. For volume and forecast group alerts, the azimuth and range is generally the location of the phenomenon being reported. The azimuth is in degrees and the range is in nautical miles. The exceptions are as follows:
   (a) An azimuth and range of 0 and 0 are used for the VAD alert
   (b) Although reported as 0 and 0, azimuth and range are not determined for the Maximum 1 Hour Rainfall Accumulation alert

9. `Storm ID -` This identifies the storm as labeled on the storm ID product (and overlay) with which the alert is associated by the RPG
10. `Storm Motion -` For all Volume (except VAD) and Forecast Group categories, where a storm ID is assigned, the storm motion for that storm is also provided

If there were no new alerts identified during the volume scan, the UAM will state `NO NEW ALERTS THIS SCAN`.

The UAM is a product and may be displayed via the Product Display GUI. See Chapter 4 for specific product display procedures.

5.2.7.6 Cancelling Alerts. As part of the RPG's alert processing, the RPG verifies that every active alert is still valid (on-going). When a particular alert condition ceases to exist, the RPG sends an alert cancellation to the OPUP. This cancellation resets the alert criteria/threshold pair for the alert area and upon the threshold being met or exceeded in any future volume scan, the RPG will reissue an alert.

Each workstation that is registered for the particular alert being cancelled will be notified of this cancellation by the OPUP Alert Registration process. The Alert Registration process will format and distribute an Alert Cancellation dialog box (appears as a grey Alert Banner) to each workstation that had been originally notified of the alert's activation. This alert cancellation dialog box is provided for operator information only and therefore, does not have the same display (pixel priority) as an active Alert Banner. It is common to have these dialog boxes obscured by other GUI windows. If not acknowledged by the operator the dialog box will time out and disappear in 5 minutes after display.

Additionally, when communications are lost (between the OPUP and RPG), for whatever reason, all active alerts are cancelled. Upon the reestablishment of communications, the RPG sends the Alert Adaptation Parameter Message to the OPUP and the OPUP sends an Alert Request Message for each alert area to the RPG. These actions reactivate the alerting process for all desired alerts and any alert criterion found will trigger a new alert notification.

5.2.7.7 Status of Received Alerts. The OPUP stores all active alerts and all alerts less than six hours old in the alert database. A listing of these alerts, including their current status, is provided by the Status and Control GUI, under the Alert Tab. See section 6.9 for specific information pertaining to the Status of Alerts.

Section 5.3. ALERT REQUEST GUI INTERFACE

5.3.1 Introduction.

The OPUP user interface design is based on a familiar window-like graphical user interface paradigm that is prevalent throughout the computer world.

5.3.2 Graphical Icons.

Graphic icons are used extensively throughout the OPUP Applications Graphical User Interface design to execute commands and functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance).

5.3.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g,. **typed command**). Variable names (like passwords, IP addresses, site specific IDs, etc.) are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all command portions that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with an actual name, address, password, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

5.3.4 Alert Request GUI Interface.

The Alert Product Request GUI provides for the creation, management, and control of product requests to all associated RPGs. Although any operator using OPUP can view the current alert category and threshold selections, access to the editing functions are limited by access level and password.

5.3.4.1 Accessing the OPUP Alert Request GUI Interface. Select the **Alert Requests** button located on the Launch Bar of the Status and Control GUI. This action loads and displays the Alert Request GUI screen that is created and maintained by the OPUP application software.

The Alert Request (AR) GUI (Figure 5-2) is divided into three distinct sections:

- the alert criteria selection section - composed of the Edit Categories and Alert Categories windows.
- the Edit Alert Area Boxes section, and
- the Alert Areas section.

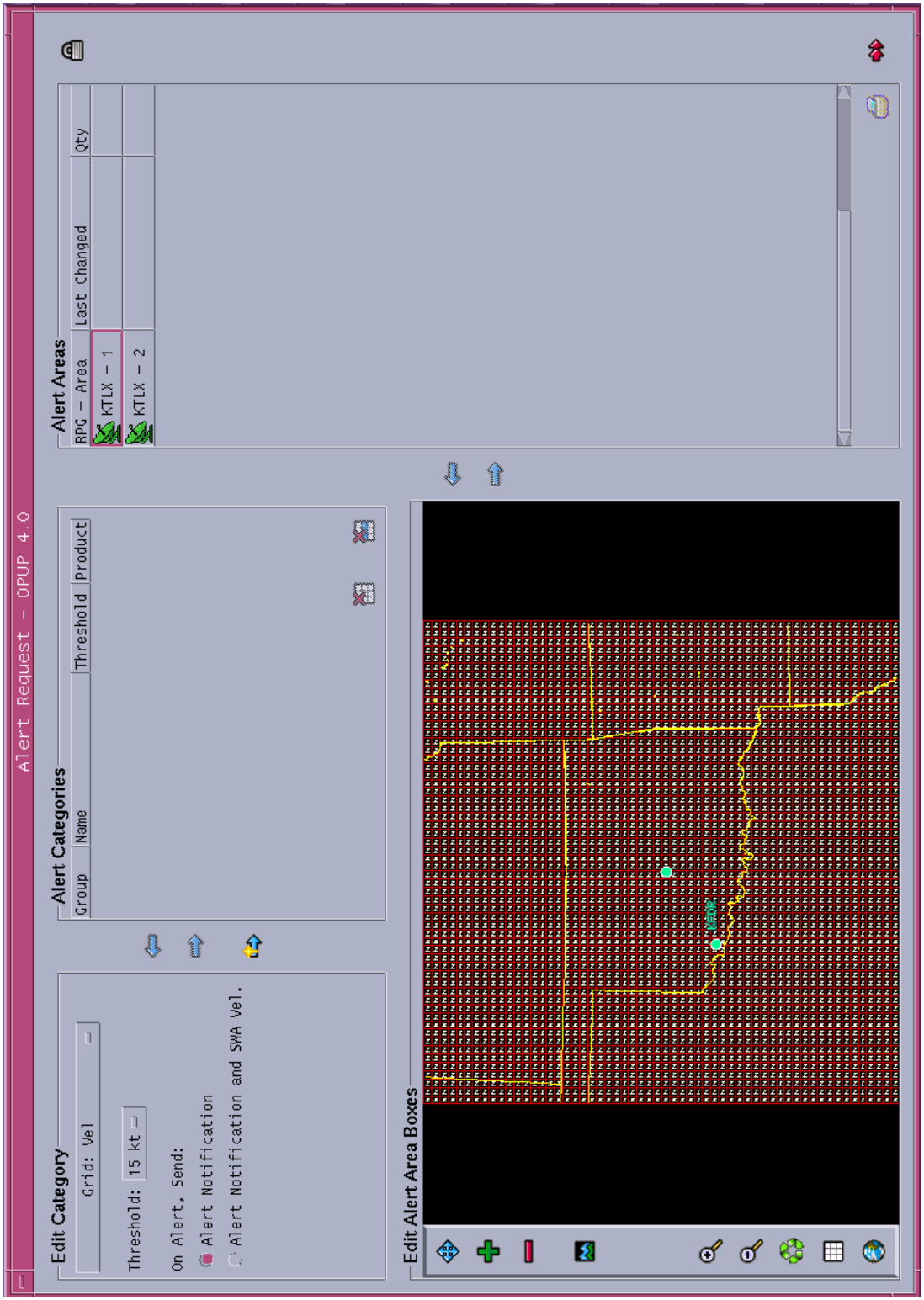


Figure 5-2. Alert Request GUI

Data is passed to adjacent areas as indicated by the blue data flow arrows.

5.3.4.2 Alert Criteria Selection Section. The alert criteria selection area includes is comprised of the Edit Category and Alert Categories windows.

5.3.4.2.1 Edit Category Window. This area supports the selection of an individual alert category, the selection of an RPG-specific threshold value for that category, and the election of whether or not to receive an alert-paired product.

5.3.4.2.1.1 Category. The Category selection drop-down menu provides a listing of all WSR-88D alert categories. When a specific category is selected, the operator is presented the valid threshold values as determined by the RPG selected in the Alert Area Definition window.

5.3.4.2.1.2 Threshold. The Threshold drop-down menu presents the valid threshold selections according to the selected RPG and category. It is important to remember that the specific values for each category are set by the RPG and are not editable at the OPUP GUI.

5.3.4.2.1.3 On Alert, Send (alert-paired product). The RPG-designated alert-paired product is listed and the OPUP operator may choose whether or not to receive this product upon activation of the specific alert.

5.3.4.2.2 Alert Categories Window. This window lists the currently defined alert categories for the particular RPG. Up to 10 alert definitions may be included for an individual RPG/Alert Area pair. New or modified alert category definitions are selected in the Edit Category window and incorporated into the Alert Categories list.

5.3.4.2.2.1 Group. This column lists the particular alert category host group (see paragraph 5.2.3).

5.3.4.2.2.2 Name. Along with the Group, Name defines the exact type of alert.

5.3.4.2.2.3 Threshold. This column provides the selected threshold value for this particular alert. This value must be met or exceeded to trigger an alert notification. Additionally, once this value has be achieved, another alert for this alert type will not be reissued until at least one volume scan has passed in which this value was not met or exceeded. (In other words, once an alert has been triggered for this alert value, another alert will not be issued for this alert type until at least one volume scan devoid of this alert value has passed.)

5.3.4.2.2.4 Product. This column reflects the operator decision to receive (Yes) or not receive (blank) the Alert- Paired Product.

5.3.4.3 Alert Areas Section. This area provides a listing of all associated RPGs for the OPUP. The RPG icon color provides information on the current communication status between the OPUP and the RPG (see paragraph 6.4.2 for more information). Two rows for each RPG are provided - one to select Alert Area 1 and one to select Alert Area 2, respectively. Clicking the mouse selects (highlights) the specific RPG/Alert Area pair. The date and time the last Alert Request

message for the specific RPG/Alert Area pair was sent to the particular RPG is also provided. Additionally, the total number of alerts categories contained in the last Alert Request message is provided.

5.3.4.4 Edit Alert Boxes Section. This area provides for the display of the current alert area definition and editing of the geographic alert area coverage for the RPG/Alert Area pair selected in the Alert Areas window.

5.3.5 Controls and Indicators.

Operator interaction with the Alert Request (AR) GUI is via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

5.3.5.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the user access level are de-sensitized (greyed-out in appearance). Alert Request GUI icon explanations/ definitions are provided below:

Edit Selected Category	(or GET CATEGORIES AND BOXES FROM SELECTED AREA) - This selection populates the edit fields in the window to the left with the parameters of the selected (highlighted) selection on the right. For example, upon selection of the LEFT ARROW adjacent to the Alert Areas (associated RPG) column, the current information for the selected (highlighted) RPG-Area will populate the fields in the Alert Categories and Edit Alert Area Boxes windows.
Save Changed Category	(or SEND CATEGORIES AND BOXES TO ALL SELECTED AREAS) - This selection overwrites (replaces) the selected item in the target (right) window with the new definition from the origin (left) window. For example, the new alert selections defined in the Alert Requests window will replace the alert requests for the selected RPG-Area in the Associated RPGs window.
Add New Category	This selection *adds* the specific alert criterion defined in the Alert Categories (left) window to the list of alert criteria in the Alert Requests window.
Clear Category List	Deletes all alert categories within the Alert Requests window.

Delete Selected Category

Deletes the selected (highlighted) line in the Alert Requests window.

Move The Map Center

Turns on the Recenter function. Each time the mouse is clicked, the Alert Area grid is recentered around the cursor location.

Turn On Alert Regions

Activates the **ADD** Alert Boxes function. To include alert area grid boxes in the alert area definition, click and drag the cursor until the resulting highlighted rectangle encompasses the desired geographic area.

Turn Off Alert Regions

Activates the **Delete Alert** Boxes function. To remove alert area grid boxes from the alert area definition, click drag the cursor until the resulting highlighted rectangle encompasses the no longer required geographic area.

Zoom In

Each time the mouse is clicked, the Alert Area grid is recentered around the cursor location and the zoom factor is increased.

Zoom Out

Each time the mouse is clicked, the Alert Area grid is recentered around the cursor location and the zoom factor is decreased.

Reset Zoom/center

Resets the Alert Area grid display to 1X zoom factor centered on the RDA location.

Toggle Grid View

Toggles On/Off the visible Alert Area grid.

Map Settings

Toggles On/Off the selected background maps.

Print

Prints the alert categories for the selected alert area.

Quit Alert Request Application	Closes the Alert Requests GUI window.
Padlock	When closed, indicates access Level 0. To change access level, click the padlock icon, select the desired access level, and enter the appropriate password. The access level will remain active until it is changed or the Alert Request GUI is closed, at which time the access level is reset to Level 0.

5.3.5.2 Security Access Levels. There are four access levels within the OPUP structure. These levels are used to control access to system areas which, if inappropriately or improperly changed, may negatively impact operations.

5.3.5.2.1 No Special Access. Level 0, no special access, is the default level for all OPUP GUI screens and information. This level allows all users unlimited access to view information and data available on the OPUP system. This level does not allow the operator to edit, delete, or create adaptation data or other operationally sensitive parameters.

5.3.5.2.2 Level 1. Level 1 access is designed to allow the shift supervisor to modify adaptation data and operational parameters that affect the current shift operation, but do not change or adversely affect the unit operation as a whole. Sending a predefined RPS list to selected RPGs is an example that requires Level 1 access.

5.3.5.2.3 Level 2. Level 2 access is the next step up in OPUP operational security. Level 2 access is designed to restrict access to adaptation data and operational parameters that impact or affect the entire unit operations. An example of parameters that require Level 2 access is alert criteria selection. The selection of alert criteria values affect all users of OPUP that rely on or expect notification from the WSR-88D alerting feature.

5.3.5.2.4 Level 3. Level 3 is the highest security level available in OPUP. Level 3 access is considered supervisory level and includes items like non-associated RPG passwords and phone numbers. Adaptation data and parameters that require Level 3 access are rarely changed and may adversely impact OPUP operations if due care is not exercised.

Section 5.4. OPUP ALERT PROCEDURES

5.4.1 Introduction.

All OPUP alert definition control is accomplished through selections via the Alert Requests GUI screen. The currently defined alert criteria are available for any OPUP operator to view; however, invoking changes to alert definitions is restricted by access level and password.

Alert Request messages are generated for each Alert Area; therefore, as you complete the alert definitions for an area, you must select the **Send** icon prior to beginning to edit the definitions for a different area/RPG. Additionally, the Alert Request GUI will not allow you to close this window until a modified alert area definition has been either sent or cancelled.

5.4.2 View the Current Alert Category and Alert Area Definition for an RPG/Alert Area Pair.

1. Open the Alert Requests GUI window by clicking on the **Alert Request** icon located on the OPUP Front Panel. The Alert Requests GUI is displayed.
2. Select the RPG of interest by clicking on the desired RPG/Alert Area pair. The selected row is now highlighted in inverse video.
3. Click on the **Get Categories and Boxes from Selected Area (Left Arrow)**.

The currently defined geographic alert area definition(s) and alert categories with attendant parameters are displayed in the Edit Alert Area Boxes and Alert Categories window, respectively. To view the alert definitions for another RPG/Alert Area pair, repeat Steps 2 and 3.

5.4.3 Adding Alert Criteria for a Selected RPG/Alert Area Pair.

1. Open the Alert Requests GUI window by clicking on the **Alert Request** icon located on the OPUP Front Panel. The Alert Requests GUI is displayed.
2. Click on the **Padlock** icon (padlock in right side border). Select Level 2, click on the password entry window. Enter your Level 2 password in the field, then click **OK**.
3. Ensure the **Padlock** icon turns yellow and unlocks.
4. Select the RPG/Alert Area pair for which to add or change alert categories/thresholds by clicking on the desired RPG/Alert Area pair. The selected row is now highlighted in inverse video.
5. Click on the **Get Categories and Boxes from Selected Area (Left Arrow)**. The currently defined geographic alert area definition(s) and alert categories with attendant parameters are displayed in the Edit Alert Area Boxes and Alert Categories window, respectively. Any new alert categories/thresholds will apply to this RPG/Alert/Area pair.
6. In the Edit Category window, click on the alert category selection drop-down menu bar located at the top of the Edit Category window.

7. Click on the desired alert category. The available threshold selections are presented in a drop-down list box below the selected category.
8. Click on the Threshold drop-down bar.
9. Click on the desired threshold value.
10. Note the available Alert Paired Product type and select whether or not to receive it by clicking on the radio button next to **nothing** to refuse it or the radio button next the product name to receive it.
11. Click on the **Add New Category** (**Right Arrow** and **Plus**) icon. This action will pass the new alert category definition to the Alert Categories window where it will be added to the alert categories list.

To add additional alert categories for the same RPG/Alert Area pair, repeat Steps 6 through 11. To modify the threshold value or Alert-Paired Product selection of a previously defined category, see paragraph 5.4.5. To delete a previously defined alert category, see paragraph 5.4.4.

When you have added all the desired categories to this RPG/Alert Area pair, and wish to send these alert definitions to the RPG, continue with Step 12. If, for whatever reason, you decide not to invoke these changes, you may select another RPG/Alert Area pair for modification or select the **Quit Alert Request Application** button to exit the Alert Requests application.

12. Click on the **Send Categories and Boxes to all Selected Areas** icon. This action saves the modifications to the alert area and categories/thresholds for that RPG/Alert Area pair and transmits an Alert Request message, reflecting these changes, to the appropriate RPG. A dialog box indicating that the alert request message was sent is displayed.
13. Click on the **Done** button.

To add alert category definitions to another RPG/Alert Area pair, repeat Steps 4 through 13. When all additions are complete, proceed to Step 14.

14. Click on the **Padlock** icon (padlock in right side border). Select **no special access**, then click **OK**. This disables the **Send Categories and Boxes to all Selected Areas** option, in essence relocking the window.

To close the Alert Requests GUI window, click on the **Quit Alert Request Application** button.

5.4.4 Delete an Alert Category from an Alert Area Definition.

Prerequisite: This procedure assumes that the selected RPG/Alert Area pair have previously been assigned at least one alert category. If this is not the case, see paragraph 5.4.3.

1. Open the Alert Requests GUI window by clicking on the **Alert Request** icon located on the OPUP Front Panel. The **Alert Requests** GUI is displayed.

2. Click on the **Padlock** icon (padlock in right side border). Select Level 2, click on the password entry window. Enter your Level 2 password in the field, then click **OK**.

3. Ensure the **Padlock** icon turns yellow and unlocks.

4. Select the appropriate RPG/Alert Area pair on which to perform the edits by clicking on the desired RPG/Alert Area row. The selected row is now highlighted in inverse video.

5. Click on the **Get Categories and Boxes from Selected Area (Left Arrow)**. The currently defined geographic alert area definition(s) and alert categories with attendant parameters are displayed in the Edit Alert Area Boxes and Alert Categories window, respectively. Any new alert categories/thresholds will apply to this RPG/Alert/Area pair.

6. Click on the category to delete. The selected category will be highlighted.

7. Click on the **Delete Selected Category** icon. The previously highlighted alert category definition is deleted from the alert tree.

To delete additional alert categories for the RPG/Alert Area pair, repeat Steps 6 and 7.

To add a new category definition to this RPG/Alert Area pair, see paragraph 5.4.3. To modify the existing category threshold or alert-paired product selection, see paragraph 5.4.5.

When you have added all the desired categories to this RPG/Alert Area pair, and wish to send these alert definitions to the RPG, continue with Step 12. If, for whatever reason, you decide not to invoke these changes, you may select another RPG/Alert Area pair for modification or select the **Quit Alert Request Application** button to exit the Alert Requests application.

8. Click on the **Send Categories and Boxes to all Selected Areas** icon. This action saves the modifications to the alert categories/thresholds for that RPG/Alert Area pair and transmits an Alert Request message reflecting these changes to the appropriate RPG. A dialog box indicating that the request message was sent is displayed.

9. Click on the **Done** button.

To delete alert category definitions from another RPG/Alert Area pair, repeat Steps 4 through 9.

10. Click on the **Padlock** icon (padlock in right side border). Select no special access, then click **OK**. This disables the **Send Categories and Boxes to all Selected Areas** option, effectively relocking the window.

To close the Alert Request GUI window, click on the **Quit Alert Request Application** button.

5.4.5 Modifying an Alert Threshold Selection.

Prerequisite: This procedure assumes that the selected RPG/Alert Area pair have previously been assigned at least one alert category. If this is not the case, see paragraph 5.3.2.

1. Open the Alert Request GUI window by clicking on the **Alert Request** icon located on the OPUP Front Panel. The Alert Request GUI is displayed.
2. Click on the **Padlock** icon (padlock in right side border). Select Level 2 and click on the password entry window. Enter your Level 2 password in the field, then click **OK**.
3. Ensure the **Padlock** icon turn yellow and unlocks.
4. Select the appropriate RPG/Alert Area pair on which to perform the edits by clicking on the desired RPG/Alert Area row. The selected row is now highlighted in inverse video.
5. Click on the **Get Categories and Boxes from Selected Area (Left Arrow)**. The currently defined geographic alert area definition(s) and alert categories with attendant parameters are displayed in the Edit Alert Area Boxes and Alert Categories window, respectively.
6. Click on the category to modify. The selected category will be highlighted.
7. Click on the **Edit Selected Category** icon. This action populates the Edit Category window fields with the selected category parameters.
8. Change the Category, Threshold, and/or Alert Paired Product selection option as appropriate, then click on the **Save Changed Category** icon. This action modifies/replaces the previously selected category and parameters with the new selections.

To modify other alert criteria for this RPG/Alert Area pair, repeat Steps 4 through 8.

To delete alert categories for the RPG/Alert Area pair, see paragraph 5.4.4. To add new category definitions, see paragraph 5.4.3.

When you have added all the desired categories to this RPG/Alert Area pair, and wish to send these alert definitions to the RPG, continue with Step 12. If, for whatever reason, you decide not to invoke these changes, you may select another RPG/Alert Area pair for modification or select the **Quit Alert Request Application** button to exit the Alert Requests application.

9. Click on the **Send Categories and Boxes to all Selected Areas** icon. This action saves the modifications to the alert categories/thresholds for that RPG/Alert Area pair and transmits an Alert Request message reflecting these changes to the appropriate RPG. A dialog box, indicating that the request message was sent, is displayed.
10. Click on the **Done** button.

To modify alert category definitions from another RPG/Alert Area pair, repeat Steps 4 through 10.

11. Click on the **Padlock** icon (padlock in right side border). Select no special access, then click **OK**. This disables the **Send Categories and Boxes to all Selected Areas** option, effectively relocking the window.

To close the Alert Request GUI window, click on the **Quit Alert Request Application** button.

5.4.6 Modify the Geographic Coverage of an Alert Area.

1. Open the Alert Request GUI window by clicking on the **Alert Request** icon located on the OPUP Front Panel. The Alert Request GUI is displayed.
2. Click on the **Padlock** icon (padlock in right side border). Select Level 2 and click on the password entry window. Enter your Level 2 password in the field, then click **OK**.
3. Ensure the **Padlock** icon turn yellow and unlocks.
4. Select the appropriate RPG/Alert Area pair on which to perform the alert area coverage modification by clicking on the desired RPG/Alert Area row. The selected row is now highlighted in inverse video.
5. Click on the **Get Categories and Boxes from Selected Area (Left Arrow)**. The currently defined geographic alert area definition and alert categories with attendant parameters are displayed in the Edit Alert Area Boxes and Alert Categories window, respectively.
6. Modify the alert area geographic coverage area as appropriate using the steps below as guidance. Then continue with Step 13.

NOTE

You may modify the alert area window appearance and add/delete background maps any time during the edit process by selecting the appropriate window manipulation icon (e.g., Zoom In, Zoom Out, etc.).

Add more boxes to Alert Area Definition.

7. Click the **Mouse Clicks turn on Alert Regions**. This action turns on the Add Boxes function. This function will remain active until disabled by clicking either the move the Map Center or turn off Alert Regions button.
8. Position the cursor over the location to begin the add boxes process. Click and hold down the mouse button while dragging the cursor over the area of interest. When the select box encompasses area desired for inclusion, release the mouse button. All the selected grid boxes are now added to the alert area definition.

NOTE

To delete grid boxes from the alert area definition perform Steps 10 through 12

9. Repeat Step 8 to add additional grid boxes to the Alert Area Definition.

When you have added all the desired categories to this RPG/Alert Area pair, and wish to send these alert definitions to the RPG, continue with Step 12. If, for whatever reason, you decide not to invoke these changes, you may select another RPG/Alert Area pair for modification or select the **Quit Alert Request Application** button to exit the Alert Requests application.

Delete boxes from Alert Areas Definition.

10. Click the **Mouse Clicks turn off Alert Regions**. This action turns on the Delete Boxes function. This function will remain active until disabled by clicking either the move the **Map Center** or turn on **Alert Regions** button.
11. Position the cursor over the location to begin the delete boxes process. Click and hold down the mouse button while dragging the cursor over the area of interest. When the select box encompasses area desired for deletion, release the mouse button. All the selected grid boxes are now deleted from the alert area definition.

NOTE

To add grid boxes to the alert area definition perform Steps 7 through 9

12. Repeat Step 11 to add additional grid boxes to the Alert Area Definition.

When you have added all the desired categories to this RPG/Alert Area pair, and wish to send these alert definitions to the RPG, continue with Step 12. If, for whatever reason, you decide not to invoke these changes, you may select another RPG/Alert Area pair for modification or select the **Quit Alert Request Application** button to exit the Alert Requests application.

13. Click on the **Send Categories and Boxes to all Selected Areas** icon. This action saves the modifications to the alert categories/thresholds for that RPG/Alert Area pair and transmits an Alert Request message reflecting these changes to the appropriate RPG. A dialog box, indicating that the request message was sent, is displayed.
14. Click on the **Done** button.

To modify alert area definition from another RPG/Alert Area pair, repeat Steps 4 through 12, as appropriate.

15. Click on the **Padlock** icon (padlock in right side border). Select **no special access**, then click **OK**. This disables the **Send Categories and Boxes to all Selected Areas** option, effectively relocking the window.

To close the Alert Requests GUI window, click on the **Quit Alert Request Application** button.

CHAPTER 6
STATUS AND CONTROL

Section 6.1. INTRODUCTION

6.1.1 General.

Chapter 6 provides an overview of OPUP and WSR-88D system status and communications control. Additionally, Chapter 6 provides detailed procedures for accessing and tailoring OPUP status screens and for controlling and managing OPUP dedicated and dial communications.

6.1.2 Chapter Organization.

Chapter 6 is organized into nine sections as follows:

- Section 6.1. INTRODUCTION - Provides a brief description of each section found in Chapter 6.
- Section 6.2. STATUS AND CONTROL GUI INTERACTION - Provides an introduction to the common GUI interaction functions.
- Section 6.3. OPUP STATUS AND CONTROL GUI MAIN SCREEN - Defines the information provided in and the selections available via the OPUP Status and Control GUI.
- Section 6.4. NETWORK MAP TAB - Defines the information provided in and control options provided by the Map Tab GUI.
- Section 6.5. SYSTEM STATUS TAB - Defines the information provided by System Status Tab GUI.
- Section 6.6. RPG STATUS TAB - Defines the information provided by the Radar Product Generator (RPG) in the General Status Message (GSM). This status information is displayable by selecting the RPG Status Tab.
- Section 6.7. GSM SUMMARY TAB - Provides information from the latest General Status Message received from each connected RPG.
- Section 6.8. FREE TEXT (MESSAGE) TAB - Provides a display of all the Free Text Messages (FTMs) received in the past 6 hours.
- Section 6.9. ALERTS TAB - Defines the information provided by the Alerts Tab GUI.

Section 6.2. STATUS AND CONTROL GUI INTERACTION

6.2.1 Introduction.

The OPUP user interface design is based on the familiar window-like graphical user interface paradigm that is prevalent throughout the computer world.

6.2.2 Graphical Icons.

The use of graphic icons to execute commands and functions is used extensively throughout the OPUP Applications Graphical User Interface design. Icons that are not valid selections due to the current active process or the user access level are de-sensitized (greyed-out in appearance).

The definition for each icon is provided under the sections describing the individual tabbed GUI where it is available.

6.2.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names (like passwords, IP addresses, site specific IDs, etc.) are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all command portions that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with an actual name, address, password, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

6.2.4 Launching the OPUP Status and Control GUI.

Select the **Status & Control** icon displayed as part of the Front Panel on the OPUP display window. This action loads and displays the Status and Control GUI screen that is created and maintained by the OPUP application software.

Section 6.3. OPUP STATUS AND CONTROL GUI MAIN SCREEN

6.3.1 Introduction.

The OPUP Status and Control GUI (Figure 6-1) was designed to support operations and management by providing a single application interface for system status monitoring, communications, alerts, and product acquisition control for the OPUP system.

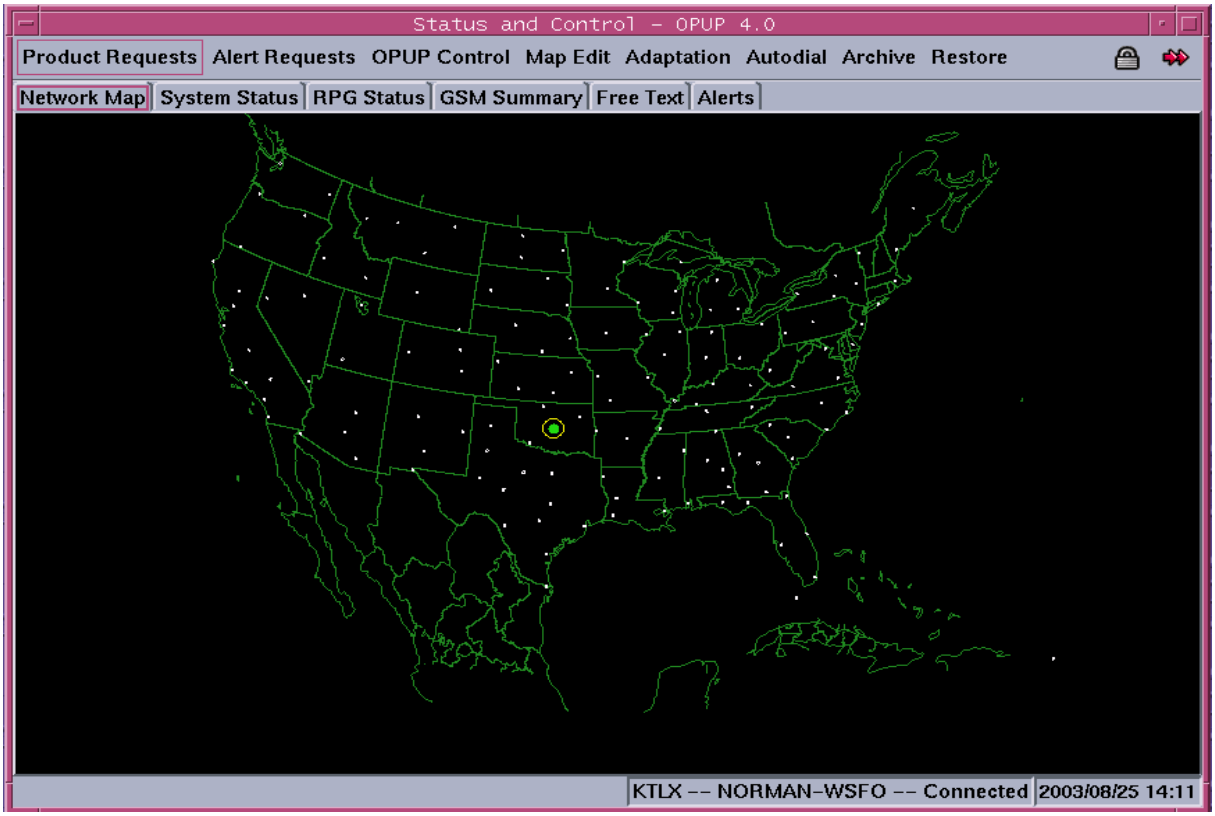


Figure 6-1. OPUP Status and Control GUI

6.3.2 OPUP Status and Control GUI Main Screen.

The OPUP Status and Control GUI Main Screen is divided into three areas: the launch bar; the tab display area; and the status area. The launch bar hosts buttons which launch other OPUP applications. Activation of the Product Request GUI and Alert Request GUI via the launch bar button has the same result as activating it through the **Front Panel** icon.

6.3.2.1 Product Requests GUI Button. Selection of this button launches the Product Request GUI as a child window to the Status and Control window. See Section 3.3 and Section 3.5 for information, definitions, and procedures regarding interactions with the Product Request GUI.

6.3.2.2 Alert Requests GUI Button. Selection of this button launches the Alert Requests GUI as a child window to the Status and Control window. See Section 5.3 and Section 5.4 for information, definitions, and procedures regarding interactions with the Alert Requests GUI.

6.3.2.3 OPUP Control Button. Clicking the **OPUP Control** button launches the OPUP Control Panel (Figure 6-2). The Control Panel has three options - Save Logs, Change Passwords, and Restart OPUP.

Figure 6-2. OPUP Control Panel

6.3.2.3.1 Save Logs. This option enables a person with the Security Level 2 password to view save logs created by an OPUP Program that has crashed (Figure 6-3).

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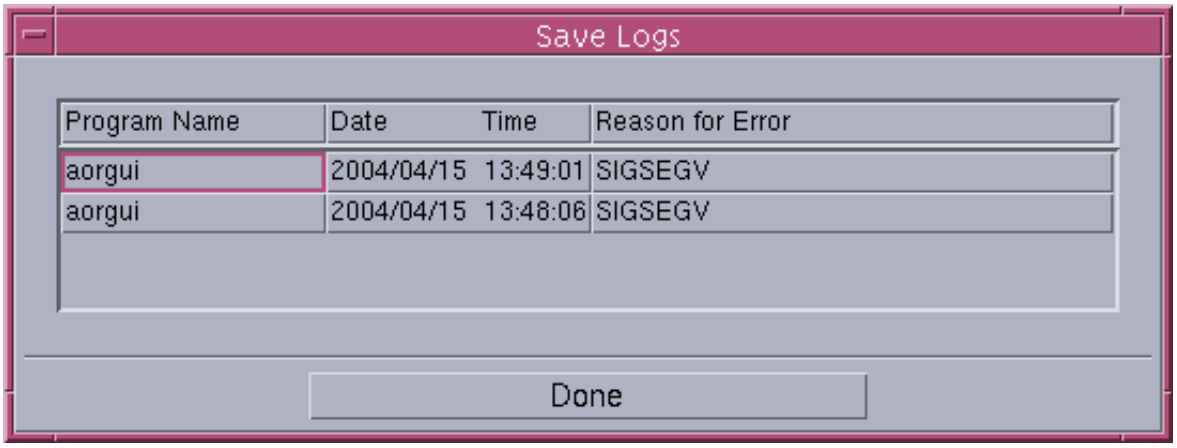


Figure 6-3. Save Logs Window

6.3.2.3.2 Change (Security Level) Passwords. This option enables a person with the Security Level 3 password to change any/all security level passwords. Upon change completion, the new security level passwords for all GUIs are immediately affected. See paragraph 6.3.2.3.3 for the step-by-step procedure for changing the GUI security level passwords.

6.3.2.3.3 Change Security Level Password Procedure.

1. Click on the **OPUP Control** button. The OPUP Control panel selection box is displayed.
2. Click on the **Padlock** icon (either the padlock within the OPUP Control panel or the one on right side border). Select Level 3, enter your Level 3 password in the field, then click **OK**.
3. Ensure the **Padlock** icon turns orange and unlocks.
4. Click on the **Change Passwords** button within the OPUP Control panel. The Change Passwords dialog box is displayed. The cursor defaults to the Level 1 password entry box, ready to accept keyboard entries.
5. Click on either the Level 1, Level 2, or Level 3 password entry box. The cursor is displayed in the selected box, ready to accept keyboard entries.
6. Carefully enter the new password for this security level in the password entry box.
7. To confirm the entry, either select the **<Tab>** key or click on the confirm entry box. The cursor is displayed in the selected confirm box, ready to accept keyboard entries.
8. Carefully retype the new password in the confirm entry box for this security level.

To change the password for another security level repeat Steps 5 through 8.

9. When all the desired passwords have been changed, click the **Done** button to close the Change Passwords dialog box. The OPUP Control panel remains displayed.
10. Click on the **Padlock** icon (either the padlock within the OPUP Control panel or the one on right side border). Select **no special access**, then click **OK**. This disables relocks the GUI interface.
11. Click on the **Done** button in the OPUP Control panel. This action closes the OPUP Control panel.

6.3.2.3.4 Restart OPUP. The **Restart OPUP** button allows the user to restart the OPUP applications software. Selecting the **Restart OPUP** button (followed by selecting **Restart** on the Confirm Restart warning popup) results in a systematic applications software shutdown followed by a complete OPUP Applications software reload from the hard disk. This process takes approximately two minutes and is used for system level task/processes failure recovery.

NOTE

Before the server processes are terminated, a popup warning dialog is displayed on each active OPUP Application GUI. This warning dialog informs the user that the server processes are either being shutdown or restarted and provides for the termination the GUI. Additionally, the user is instructed not to relaunch the Application GUI until after the OPUP server processes are restarted.

6.3.2.4 Map Edit Button. Selection of this button launches the Background Map Editor GUI. This GUI is used to locally customize baseline WSR-88D background maps and to create maps locally. See Chapter 10 for more information.

6.3.2.5 Adaptation (Data) Button. Selection of this button launches the Adaptation Data editor GUI. This GUI is used to customize the local OPUP look and feel. Additionally, this GUI is used to specify which products are disseminated to other display and distribution platforms. See Chapter 9 for more information.

6.3.2.6 Autodial Button. Selection of this button launches the Autodial GUI. This GUI is used to define and invoke autodial sets. Once active, the Autodial function will automatically dial the specified RPG and request the designated product(s). Once the products are received, the OPUP terminates the connection and then waits the predetermined time interval and starts the dial process over again. The Autodial function will continue this process until it is terminated by operator interaction. See Chapter 8 for additional information.

6.3.2.7 Archive Button. Selection of this button launches the Archive definition GUI. This GUI is used to define the products, RPGs and inclusive times for building and saving archive data sets to the local Archive directory. See Chapter 7 for more information.

6.3.2.8 Restore Button. Selection of this button launches the Archive Restore GUI. This GUI is used to select an archive data set from the Archive directory. Once selected, the archive data set is used to populate the Archive database, where it is made available to the Archive Product Display and Archive Status GUIs. See Chapter 7 for more information.

6.3.2.9 Padlock Icon. Selection of this icon enables the user to change applications security levels. There are four access levels within the OPUP applications software structure. These levels are used to control access to areas and parameters which, if inappropriately or improperly changed, may negatively impact operations.

6.3.2.10 Exit Icon. The **Exit** icon, extreme upper left side, is provide to systematically close the Status and Control GUI. Remember, when a parent GUI is closed, all active child windows are also closed.

6.3.2.11 Tab Display Area. Particular information is displayed and specific control functions are accessed through the individual GUI screens displayed in this area. Each GUI screen is accessed by the selecting the appropriately labeled tab. Individual sections below, describe the information available and detail the control functions activated through each tabbed GUI screen.

6.3.2.12 Status Area. Located at the lower right hand corner of the OPUP Status and Control GUI display window, this area provides two important pieces of information.

6.3.2.12.1 RPG ID. The left hand portion of the status window provides the RPG ID that is the current focus of the OPUP Status and Control GUI. This focus controls the input data source for the System Status Tab GUI. In other words, the information provided for the System Status Tab originated from that radar (RPG).

NOTE

Change the focus radar by selecting the desired radar icon on the Map Tab display.

6.3.2.12.2 OPUP System Time. This area displays the current OPUP system date and time. This is not the volume scan time which is assigned by the Radar Data Acquisition (RDA) unit and displayed on products, but is the local OPUP server processor time.

Section 6.4. NETWORK MAP TAB

6.4.1 Introduction.

By default, when the Status and Control GUI is launched for display, the **Network Map Tab** is the active tab screen. This screen displays a graphic depiction of the surrounding geographic area with color-coded radar icons, depicting dedicated (associated) radars, superimposed (Figure 6-1). This screen was designed to provide a quick status overview of OPUP data availability, to highlight radar outages, and to assign the radar focus for the System Status GUI and communications control functions via the Network Map Tab GUI.

6.4.2 Radar Icon.

The radar icons represent the associated RPGs (radars) for your specific OPUP. The radar icons are color-coded to provide the following connectivity status:

- GREEN - The OPUP-to-RPG narrowband line is connected and the OPUP is communicating with the RPG. This does not necessarily mean that radar products are available - just simply that message traffic is being received from the RPG.
- GREY - The line is disconnected via command at the OPUP end.
- YELLOW - The OPUP-to-RPG narrowband line is connected; however, the RPG is reporting a loadshedding alarm and products may not be available. Additional status information should sought via the System Status GUI.
- BRIGHT RED - The OPUP-to-RPG narrowband line is connected, however the RPG is reporting a critical failure and products are not available. Additional status information should be sought via the Status GUI.
- BRICK RED - The OPUP-to-RPG narrowband line is PENDING (not connected). This is the normal state for non-associated RPGs. However, this is not desirable for associated RPG connections and further investigation is warranted.
- PURPLE - RPG side disconnected the communications link.
- LIGHT BLUE - The OPUP is dialing a non-associated RPG in response to a one-time product request generated via the Product Request GUI.
- BLUE - The OPUP has a dial-in connection to the RPG.
- WHITE - The message handler software task (mcu) is not responding. This is a serious communications failure. If the mcu does not recover, the OPUP software will require a restart to resolve the problem.

6.4.3 Radar Focus.

Along with OPUP's multiple RPG connection capability comes a plethora of status information and control options. To provide system status information in easily manageable blocks, the System Status GUI provides a graphical display of status information from only one radar (RPG) at a time. This is accomplished by assigning the focus to a specific radar. The radar (RPG) currently in focus is distinguished on the map graphic by a yellow ring around the radar icon.

6.4.3.1 Determining the Focus Radar. The radar RPG ID that is currently in focus is displayed in the lower right hand corner of the Status and Control screen. Additionally, on the Map Tab GUI, the in-focus radar is distinguished by a yellow circle around the appropriate radar icon.

6.4.3.2 Changing the Focus Radar. To change the focus radar, simply position the cursor over the desired radar icon, and click the **left** mouse button. A yellow circle will appear around the selected radar icon.

Selecting a radar icon changes the radar focus for the System Status GUI tab to that particular radar.

6.4.4 Network Map Tab Drop-down Menu.

The momentary drop-down menu provided as part of the Network Map GUI display allows the operator perform communications control functions. The RPG ID of the in-focus RPG is presented at the top of the drop-down menu. The communication control selection from this menu will ONLY refer to this RPG.

6.4.4.1 Operation of Drop-down Menu. To activate the drop-down menu, click or press and hold down the **right** mouse button. To make a selection, move the mouse to position the cursor over the desired option and release the mouse button. Clicking the **right** mouse button will execute the selected function and erase the drop-down menu.

6.4.4.2 Communications Control. All OPUP communications line control is exercised via this drop-down menu. With the proper access level and password, the OPUP operator may command a communications line to connect or disconnect via this menu.

6.4.4.2.1 Connect Communications Line Procedure. This procedure will attempt to reestablish (enable) communications over a line that has been disconnected (disabled).

Prerequisite: This procedure assumes that the selected communications line is currently in a disconnected state.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.
2. Ensure the padlock icon turns green and unlocks.
3. Click on the **Radar** icon that you wish to reestablish communications with (enable the line).
4. Ensure that the focus is assigned to the selected radar and a yellow circle is displayed around the radar icon. Additionally, the four letter ID of the selected RPG is displayed in the status area (lower right side of display window).
5. Position the cursor in the Network Map Tab display area and click the **right** mouse button. The drop-down menu is displayed with the desired RPG ID on the top line.

6. Move the mouse to position the cursor over the **Connect** button in the drop-down menu and click the **right** mouse button. The drop-down menu will disappear and the OPUP software will attempt to reestablish communications with the selected RPG.
7. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

6.4.4.2.2 Disconnect Communications Line Procedure. This procedure will sever (disable) communications over a line that is currently connected (enabled).

Prerequisite: This procedure assumes that the selected communications line is currently in a connected state.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns green and unlocks.
3. Click on the **Radar** icon that you wish to sever communications with (disable the line) click.
4. Ensure that the focus is assigned to the selected radar and a yellow circle is displayed around the radar icon. Additionally, the four letter ID of the selected RPG is displayed in the status area (lower right side of display window).
5. Position the cursor in the Network Map Tab display area and click the **right** mouse button. The drop-down menu is displayed with the desired RPG ID on the top line.
6. Move the mouse to position the cursor over the **Disconnect** selection in the drop-down menu and click the **right** mouse button. The drop-down menu will disappear and the OPUP software will sever communications with the selected RPG. No additional products or status information from this RPG will be available until communications is reestablished.
7. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

To reestablish communication, refer to paragraph 6.4.4.2.1.

Section 6.5. SYSTEM STATUS TAB

6.5.1 Introduction.

This tab provides a listing of all stored OPUP system status messages that are available in the OPUP data base (Figure 6-4).

Figure 6-4. System Status Tab Display with Sort Options

6.5.2 Icons and buttons.

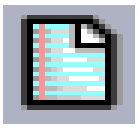
The System Status Tab GUI provides three unique icons and two buttons used to customize the status messages display.

6.5.2.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to either the current active process or the user access level are de-sensitized (greyed-out in appearance). A brief explanation/definition of the two icons presented on the System Status GUI is provided below:

System Log Filter

Selection of this icon activates a child window that allows the operator to specify filter category options used to compile a customized listing of specific messages.

Show All Messages



This icon launches a child window listing all available messages from the OPUP data base. This window is static and will not update as new messages populate the data base.

Print

This icon prints the displayed messages to the selected printer. This print function works best if the landscape option is selected.

6.5.2.2 Buttons.

Apply Selection of this button activates the filter function to compile a list of messages that meets the operator specified criteria. This new listing is displayed in a separate child display window.

Done Selection of this button closes the host child window.

6.5.3 Information and Sort Order.

The following information (Figure 6-4) is provided for each message in the listing. This listing is ordered by the date and time the message was received/formatted by the OPUP system. Additional sorting options are available by selecting a column heading.

6.5.3.1 Time. This is the OPUP system time when the message was generated. By default, the status messages are listed in chronological order (most recent to oldest). Selecting the time sort option reverses the sort order.

6.5.3.2 Severity. OPUP status messages are assigned a severity level by the application issuing

the message. There are currently eight severity levels, of which only Debug, Information, Important Information, Severe, and Fatal have important meaning for operations. However, a brief explanation for all eight is provided below.

- `Debug -` Message is important for software development and system recovery efforts following a crash, system hang, or unexpected/undesired system response. These messages are used for fault isolation of recurring application failures due software malfunctions, bugs and/or memory leaks.
- `Information -` Provides information as to the status or state of operation of a particular task/application.
- `Important Information -` Provides important or additional information as to the status or state of operation of a particular task/application.
- `Not Severe -` General informative message.
- `Not Anticipated -` An unexpected response to a system request, command, inquiry, or input.
- `Severe -` An error has occurred that may cause a OPUP applications or system failure or be detrimental to OPUP operations.
- `Logical -` General informative message.
- `Fatal -` An error as occurred that has caused an OPUP application to fail or become unresponsive.

To reorder the messages by severity group, sort the list by severity.

6.5.3.3 App. The OPUP Application to which the message refers or originated from is listed in this column. Selecting this column for the sort option reorders the list alphabetically.

6.5.3.4 Id. This column lists the login identification name of the affected machine/interface.

6.5.3.5 Message. This column lists the text/code messages for review. Selecting this as a sort option groups all similar messages for display.

6.5.4 Status Message Filter.

The capability to filter the message list is provided. This filter capability allows the user to display only those messages desired in a customized list. The same information and sort option are available as in the complete listing.

6.5.4.1 Status Message Filter Options. The following options are provided to build a customized message list. This new list will be displayed in a child window.

- `Date -` Allows you to specify an inclusive period (start and end date and time) for inclusion in the list contents.
- `Process Name -` Limits the list to those messages generated by the specified process or processes.

- `Process Identification -` Allows you to specify the exact Id for which to limit the displayed list.
- `Message -` Limits the list to only those exact messages of interest.
- `Severity -` Limits the list to only those severity levels specified.

The filter options may be used individually or in combination to ensure that the customized list only provides the messages of interest.

Section 6.6. RPG STATUS TAB

6.6.1 Introduction.

The information under this tab reflects the current status of the in-focus RPG as reported in the RPG General Status Message (GSM).

6.6.2 RPG Status Information.

The following information is available through the GSM:

- New Product Status:(a) (b) where

  (a) = AVAILABLE, LOAD SHEDDING or UNAVAILABLE

  - Available means products are being received. Note that this is not an indication of dial-up line product availability status.
  - Load Shedding means the RPG is currently loadshedding some product requests but generally, products are available.
  - Unavailable means products are not being received.

  (b) = blank if everything is normal, or DEGRADED if the RDA is reporting that data processing problems, some of the base data may be suspect.

- Base Data Enabled: (a) (b) (c) where

  (a) = REF if Reflectivity base data is available.

  (b) = VEL if Velocity base data is available.

  (c) = SW if Spectrum Width base data is available.

  Those which are not available will be blank in those positions.

- Operational Mode/VCP: (a) (b) where

  (a) = The Operational (Weather) Mode A, B, etc., currently in effect at the RDA/RPG/PUP. Mode M is reserved for RPG Maintenance Mode

  (b) = the current Volume Coverage Pattern number in effect at the radar, or blank if not available.

- Dedicated RPG Communications: (a) (b) where

  (a) = ENABLED or DISABLED based on the OPUP operator selection for connection of the dedicated RPG to OPUP communication line(s).

  (b) = CONNECTED, DISCONNECTED, or FAILED based on the current hardware line status. If Disconnected or Failed, then no other information except the current operational (weather) mode in effect at the RDA is listed, and obviously, products are not available over the dedicated line. FAILED indicates that a hardware problem with the line has been detected.

- RPG Availability: (a) (b) (c) where

  (a) = Blank if no status has been reported from the RPG. AVAIL if the RPG hardware is available for producing products.

  - UNAVAIL if the RPG hardware is unavailable for producing products.

  (b) = Blank if not available.

  - ON LINE if everything is working **OK** at the RPG.
  - MAINT RQRD if products are available but there is some type of problem at the RPG requiring maintenance.
  - MAINT MAND if products are not available from the RPG due to a problem requiring mandatory maintenance.
  - SHTDN if the MSCF operator has requested that the RPG be shutdown. Normally, the communications will disconnect following this. If they do not, the RPG is providing false information.

  (c) = Blank if the RPG is not loadshedding products or, LOAD SHEDDING, if it currently is. Loadshedding means that not all products currently being requested by associated users are being distributed (and sometimes generated) due to the fact that the requests exceed the RPG system capacities.

- RPG Narrowband: (a) where

  (a) = Blank if not available.

  - NORMAL if a dedicated narrowband communication line is connected to the associated RPG and the RPG is reporting normal operation.
  - CMND DSCNCT if a narrowband line disconnect command has been selected by the RPG operator. Normally the line will actually disconnect following this. If it does not, the RPG is providing false information.
  - NRBND LDSHD will be reported if the narrowband communications is unable to support the amount of data which has been requested from the RPG.

- RPG Software: (a) where

  (a) = Blank if this status is not available. TEST MODE if the RPG is switching to test mode. In test mode, the RPG will disconnect all communications lines except for the RPGOP line.

  - SHUTDOWN if the RPG software has been shutdown by the RPG operator or if the RPG has initiated a Restart and the narrowband line has not connected within 30 seconds.
  - STANDBY if the RPG is not generating products but has some software tasks running. It will normally disconnect its narrowband communication lines to OPUPs and the RPGOP in this mode.
  - OPERATE if the RPG software is on line and generating products normally.
  - RESTART if the RPG software is about to undergo a reset. Following this, it will normally disconnect the narrowband communication lines and then reconnect them when the restart is complete.

- RPG Alarms:(a) (b) (c) where

  (a) = Blank if no alarms.

  - CPU if there is an RPG CPU overload condition.
  - BASE DATA DISK FAILURE if there is a hardware disk failure on which the RPG stores base data.
  - PRODUCT DISK FAILURE if there is a hardware disk failure on which the RPG stores products.
  - INPUT BUFFER if the RPG is loadshedding products in an attempt to keep up with base data arriving from the RDA.
  - PROD STORAGE if there is a problem with storing products on the RPG disk. This may or may not immediately affect its ability to generate and send products, depending upon the problem severity.
  - WIDEBAND if there is a wideband communications hardware failure between the RPG and RDA. No new products can be generated in this case.
  - MLOS FAS if a microwave communications failure between the RDA and RPG has occurred.
  - INTERCOMPUTER LINK if the narrowband communications link between redundant RPGs has gone down.
  - REDUNDANT CHANNEL if a communications problem exists between two RPGs (e.g., communication protocol).

  (b) = Blank if no RPG memory problem, or, MEMORY if there is an RPG computer memory problem.

  (c) = Blank if no RPG control problem, or CONTROL if there is an RPG CPU hardware problem. (Don't expect to see this message too often since it is the RPG which must send this status.)

- RDA Availability: (a) (b) (c) where

  (a) = Blank if no status has been reported from the RDA to the RPG.

  - AVAIL if the RDA hardware is available for collection and transmission of base data.
  - UNAVAIL if the RDA hardware is not available for the collection and transmission of base data.

  (b) = Blank if unknown.

  - ON LINE if everything is working **OK** at the RDA.
  - MAINT RQRD if the RDA is sending data to the RPG but there is a non-critical hardware failure.
  - MAINT MAND if the RDA is still able to send data to the RPG but there is a critical hardware failure requiring mandatory maintenance.
  - CMND SHTDN if the RDA software has been commanded to be shutdown by the RDA operator.

- INOPERABLE if the RDA is down due to critical problems or the wideband communications is shutdown from the RDA to the RPG.
- WDBND DSCNCT if the RDA is unavailable due to the fact that the wide-band to the RPG is disconnected.

(c) = Blank if Auto Calibration normal.

- AUTO CAL DISABLED if the RDA is using the operator-entered value for gain correction versus the normally used computer calculated value.

• RDA Software: (a) where

(a) = Blank if unknown.

- OPERATE if operating normally.
- STANDBY if the RDA is in standby mode. No data is available.
- RESTART if the RDA is in a Restart mode. No data is available.
- OFLN OPER if the RDA is in Off-line Operate mode. This mode is used for maintenance and trouble shooting. No data is available.
- STARTUP if the transmitter is in a warm-up state.

• Delta Sys Cal: The difference in decibels (dB) between the gain scale factor (Sys Cal) that is used by the Programmable Signal Processor (PSP) and the default Sys Cal contained in RDA adaptation data. The PSP uses Sys Cal to scale reflectivity estimates. The Sys Cal used by the PSP is usually computed by the RDA's calibration function but can be overridden by the RPG HCI operator or a technician via the RDA maintenance console.

• RDA Alarms:

(Note that the RDA Availability will indicate whether the product data is being affected)

- TOWER/UTIL if a sensor in the radar tower indicates a problem.
- PEDESTAL, XMTR, RCVR/SIG PROC if there is a detected problem with these pieces of hardware.
- CONTROL if there is a problem with the RDA Data Acquisition Unit.
- WIDEBAND if there is a problem with the RDA to RPG communications link.
- WIDEBAND USER if the wideband link between the RDA and another user (not the RPG) has been disconnected.

This display is produced by the OPUP and is not a product either requested or produced by the RPG. It is created at the OPUP at the time of display from status information sent from the RPG and saved by the OPUP. The timeliness and accuracy of this information is dependent upon the RPG. This information is updated and sent by the RPG whenever the RPG status changes.

Section 6.7. GSM SUMMARY TAB

6.7.1 Introduction.

This tab provides a summary of information received as part of the General Status Message (GSM) from each connected RPG.

6.7.2 RPG GSM Information.

Each time an OPUP establishes a connection to an RPG or there is a change in status of a connected RPG, a GSM is sent to the OPUP. The GSM Summary Tab GUI displays a brief summary of the contents of these messages and the time the message was generated by the RPG. The GSM entry on this GUI is erased when the RPG-to-OPUP communications line is not connected (e.g., connection is terminated by the OPUP, connection is lost due to line failure, etc.).

6.7.3 GSM Entries.

The following paragraphs provide information defining the meaning of the entries displayed via the GSM Summary Tab GUI.

6.7.3.1 RPG. This field provides the 4-letter identifier (RPGID) and RPG number (each RPG has a unique identification number). The displayed 4-letter identifier is that of the RPG assigned, in OPUP configuration data, to the particular link over which the message was received. The RPG number is the unique RPG identification number contained in the GSM message header. If these two entries (4-letter RPGID and RPG number) **DO NOT** correspond to the same RPG, an OPUP User Action Message popup is displayed warning of a mismatch.

NOTE

> In the event the 4-letter RPGID and RPG number **DO NOT** correspond to the same RPG, immediate user action is required. Communication configuration changes have occurred and the OPUP configuration files ***do not*** match the physical communication cabling/wiring.

6.7.3.2 Time. The date and time the GSM was generated by the RPG.

6.7.3.3 Status Message. The Status Message field provides pertinent informations regarding the current operation of the connected radar system. Each message starts with the entry; GSM:.

6.7.3.3.1 link. The “link = #” entry provides the OPUP communications link reference number.

6.7.3.3.2 rpg. The “rpg=XXXX (###)” entry provides the RPGID assigned (in OPUP configuration data) to the specific link and the unique RPG identification number received in the message header.

.

6.7.3.3.3 wx mode. The active weather mode for the connected radar system. This field is currently restricted to either a 1 or 2.

- 1 corresponds to Clear-Air Mode
- 2 corresponds to Precipitation (storm) Mode

6.7.3.3.4 vcp. This entry identifies the current volume coverage pattern being executed at the RDA.

6.7.3.4 Graphical Representation. Refer to the RPG Status Tab (Section 6.6) for a graphical display of the GSM contents.

Section 6.8. FREE TEXT (MESSAGE) TAB

6.8.1 Introduction.

Free Text Messages (FTMs) are a quick and convenient tool for the RPG operator to send status and update messages to all users of data from the particular RPG. The Free Text Tab displays a GUI that provides a display of all the FTMs received in the past 6 hours.

6.8.2 Free Text (Message) GUI.

The Free Text (Message) GUI (Figure 6-5) displays the content of all the Free Text messages received in the past six hours.

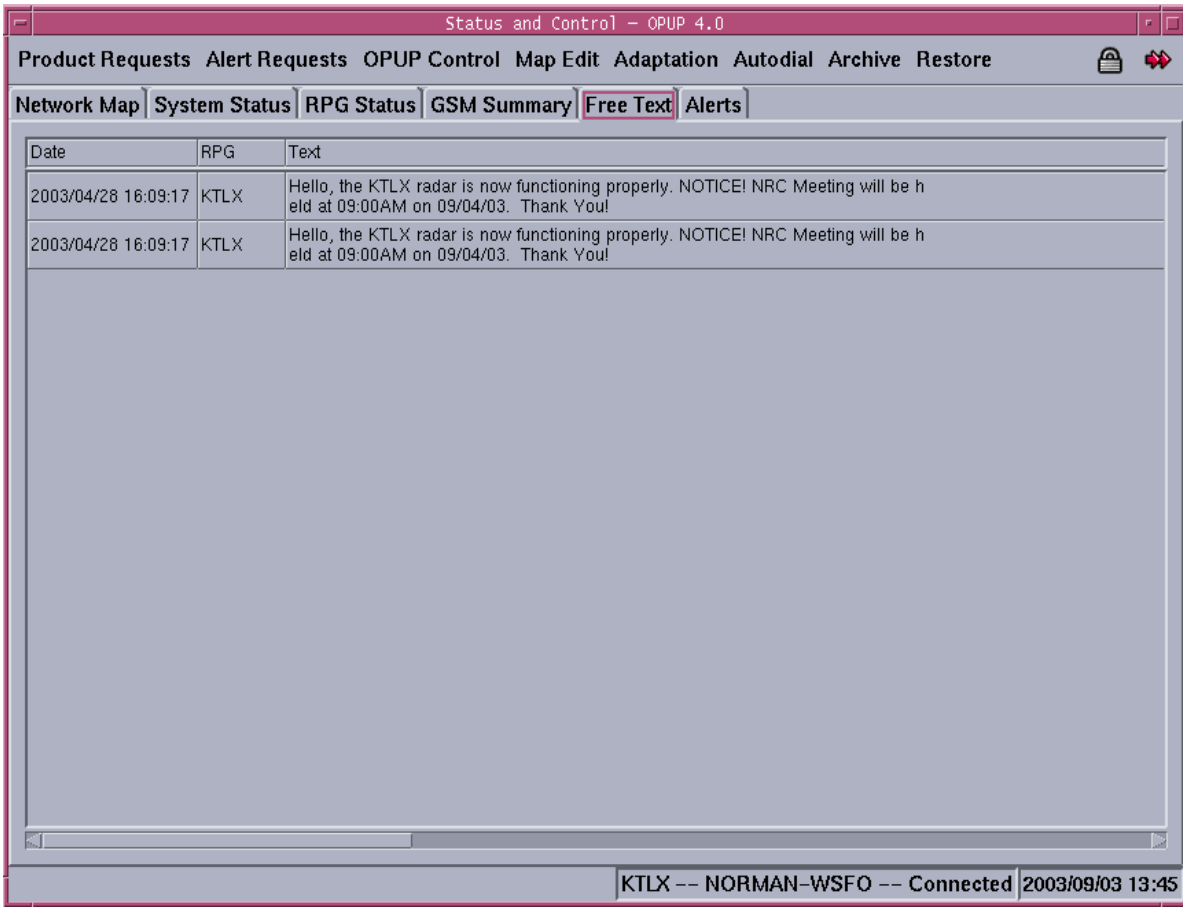


Figure 6-5. Free Text (Message) GUI

6.8.3 FTM Information.

Under the Free Text Tab, the following information is provided for each FTM:

- Date - The volume scan date and time the FTM was generated by the RPG.
- RPG - The four letter RPG ICAO identifier.
- Text - The text of the message.

6.8.4 Sort Options.

By default, the FTMs are listed in chronological order. You may change this list order by positioning the cursor over a column header and clicking. Selection of any column header causes the FTM list to be reordered according to that selection. For example, selecting the RPG column reorders the listing with all the FTMs for each RPG listed together.

Section 6.9. ALERTS TAB

6.9.1 Introduction.

The Alert Tab (Figure 6-6) provides a listing of each alert, with its attendant parameters, received in the past 6 hours, including its current status. Additionally, an alert filter function (refer to paragraph 6.9.3), which is activated by clicking on the **Alert Filter** icon, is available to limit the display of alert information to only those alerts of immediate interest at the time.

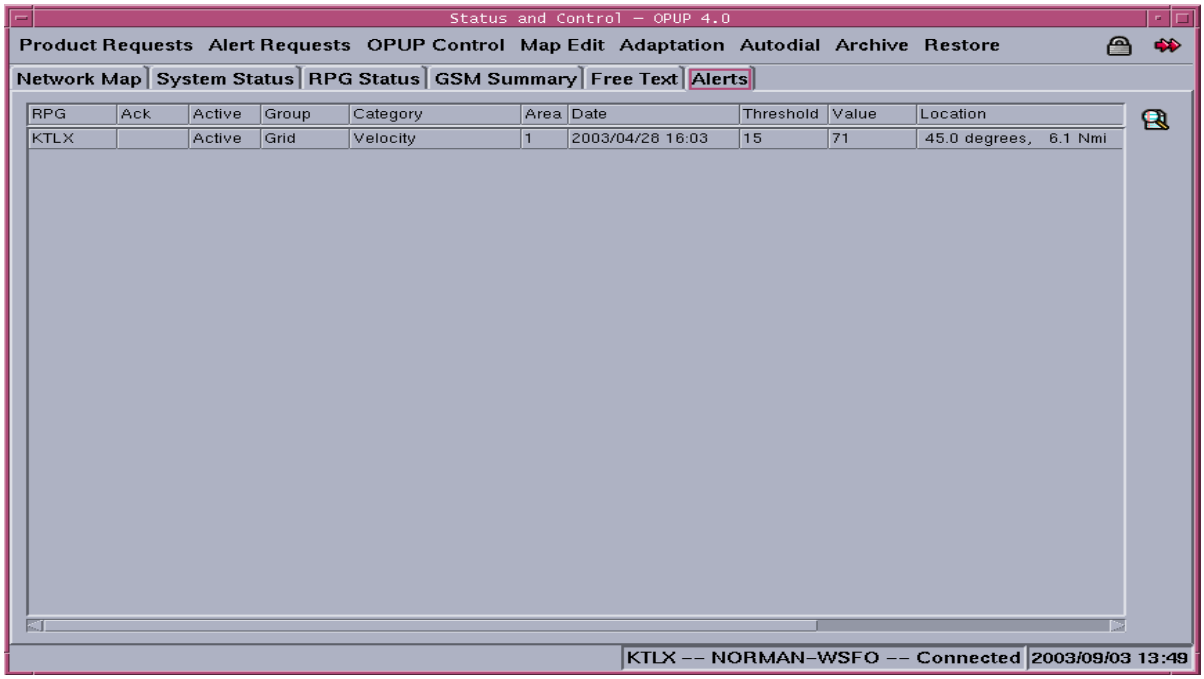


Figure 6-6. Alert Tab

6.9.2 Alert Information.

Under the Alert Tab, the following information is provided for each alert:

- RPG - The four letter RPG ICAO identifier.
- Ack - This is the user acknowledged state.

- Active - The field reflects the current alert state. The two possible entries are:
  - Yes - the alert is still active (i.e., the threshold value for the particular alert is still being met or exceeded).
  - Blank - a blank field indicates that the alert has been cancelled by the RPG.
    - The alert may be cancelled in one of three ways:

      (1) The RPG cancelled the alert because the alert criterion is no longer being met.

      (2) The OPUP has sent a new Alert Request Message (ARM) to the RPG. This action results in a cancellation of all currently active alerts in preparation for the new alerts resulting for the new ARM. If the same criterion is included in the new ARM, a new alert will be issued by the RPG as soon as the criterion is again met or exceeded (usually at the end of the volume scan).

      (3) There has been a disruption in communications between the OPUP and RPG and the connection was not immediately reestablished. A loss of communications results in a cancellation of all currently active alerts. When communications are reestablished the OPUP will send a ARM and alert processing for the OPUP's criteria will be initiated by the RPG.
- Group - The alert group is used with the alert category to identify the type of alert. (See Chapter 5 for more information.)
- Category - The alert category is used with the alert group to identify the type of alert. (See Chapter 5 for more information.)
- (Alert) Area - Either Alert Area 1 or 2. Specifies the area in which the alert was triggered.
- Date - Volume scan date and time of the Alert Notification Message that either identified or cancelled the alert.
- Threshold - This is the OPUP operator-selected value (from the Alert Request Edit screen) which corresponds to a particular RPG adaptation data setting (which may vary from one RPG to the next). This value was met or exceeded within the identified alert area, causing the RPG to send the alert to the OPUP.
- Value - This is the actual data value found by the RPG that triggered the alert.
- Location - The azimuth and range of the value that triggered the alert. For grid based alerts, these identify the center location of the alert grid box which triggered the alert. For volume and forecast group alerts, the azimuth and range is generally the location of the phenomenon being reported. The azimuth is in degrees and the range is in nautical miles. The exceptions are as follows: An azimuth and range of 0 and 0 are used for the VAD alert. Although reported as 0 and 0, azimuth and range are not determined for the Maximum 1 Hour Rainfall Accumulation alert.
- Cell ID - If applicable, the alert is associated with a near-by storm that has been identified by the Storm Cell Identification and Tracking (SCIT) algorithm.

6.9.3 Alert Filter.

Selecting the Alert Filter icon (Figure 6-7) displays the Alert Filter dialog box (Figure 6-8).

Figure 6-7. Alert Filter Icon

The Alert Filter option dialog allows the user to filter the alert listing to only include those alerts of immediate interest.

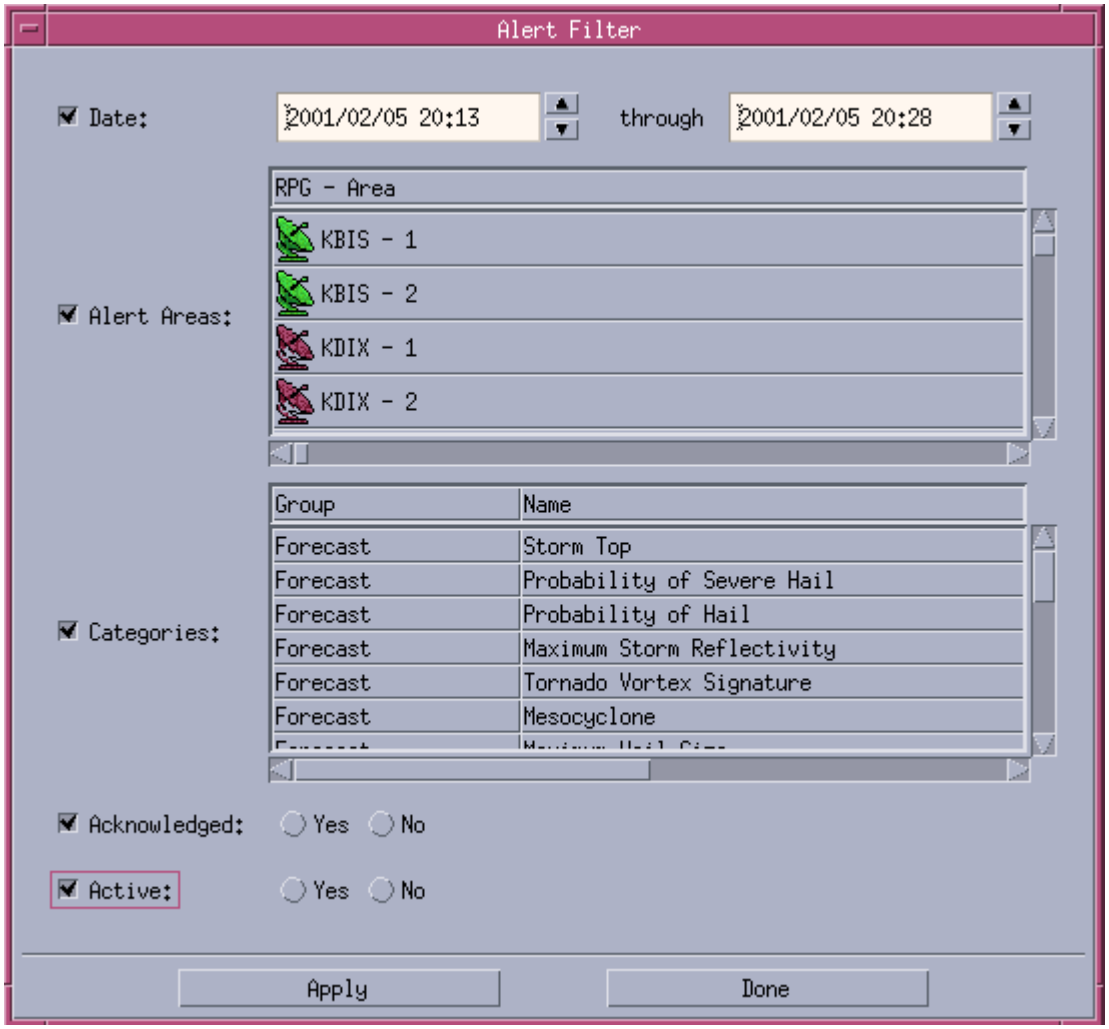


Figure 6-8. Alert Filter

When the **Alert Filter** icon is selected, the icon turns red to indicate that the display is filtered. When filtering is active, the Alerts Tab display window only lists those alerts that meet the filter

criteria.

The following options are provided to build a customized message list. This new list will be displayed in a child window.

Date	Allows you to specify an inclusive period (start and end date and time) for inclusion in the list contents.
Alert Areas	Limits the list to those messages from the specified RPG/Alert Area pair(s).
Categories	Allows specific categories for which to limit the displayed list.
Acknowledged	Limits the list to only those alerts that have or have not been acknowledged by a user, according to the selected state.
Active	Limits the list to only those alerts that are still active or inactive, according to the selected state.

The filter options may be used individually or in combination to ensure that the customized list only provides the alerts of interest.

NOTE

When the filter option is active (as indicated by the **Alert Filter** icon being RED), **ONLY** those alerts meeting the filter criteria will be listed in the Alerts Tab window display. To display all alerts received in the past six hours turn off the filter criteria.

6.9.4 Sort Options.

By default, the alerts are listed in chronological order. Change this list order by positioning the cursor over a column header and clicking. Selection of any column header causes the alert list to be reordered according to that selection. For example, selecting the Active column reorders the listing with all the Active alerts listed together before all the Cancelled (inactive) alerts.

CHAPTER 7
OPUP ARCHIVE

Section 7.1. INTRODUCTION

7.1.1 General.

Chapter 7 provides a OPUP Archive feature overview. Additionally, Chapter 7 provides detailed procedures for recording products to the Archive media and reading previously Archived products into the OPUP Archive database for post-event review and analysis.

7.1.2 Chapter Organization.

- Chapter 7 is organized into six sections as follows:
- Section 7.1. INTRODUCTION - Provides a brief description of each section found in Chapter 7.
- Section 7.2. OPUP ARCHIVE FEATURE - Provides an overview of the OPUP Archive feature.
- Section 7.3. ARCHIVE GUI - Describes the functions available via the `Archive` GUI.
- Section 7.4. RESTORE GUI - Details the restore Archive function controlled by this GUI.
- Section 7.5. OPUP ARCHIVE DATA SET CREATION PROCEDURES - Provides step-by-step procedures for copying a specific product data set to the Archive directory structure on the OPUP server.
- Section 7.6. ARCHIVE DATA SET RESTORE AND DISPLAY PROCEDURES - Provides step-by-step procedures for retrieving and displaying a previously recorded Archive data set.

Section 7.2. OPUP ARCHIVE FEATURE

7.2.1 Introduction.

The main purpose of the OPUP Archive (Archive Level IV) function is to record product and status messages on a durable, exportable media for permanent, local retention. This permanent record supports the requirement to collect and retain data pertaining to any rare or catastrophic event that may affect a covered asset.

These data can be read back into the OPUP for investigative support or further analysis. Additionally, event- and/or phenomena-based data sets made be recorded to support local training objectives.

7.2.2 Archive Feature.

The OPUP Archive function consists of the four inter-related yet independent processes. Two of the processes, Archive data set definition (Archive) and Archive data base creation (Restore), are operator GUI operations; while the other two, copy Archive data sets to and from CD-ROM, are administrative GUI operations.

7.2.2.1 Archive Data Set Creation. The Archive GUI supports the specification of a data set based on source RPG(s), date/time span and product type(s). Once the desired data set is defined the Archive function copies the data from the operational data base to a reserved Archive directory structure on the OPUP server hard drive.

NOTE

> The size of each data set is limited to 700 MB by the `Archive` GUI. This ensures the entire data set, including the required housekeeping information, can be copied to a single CD-ROM. Since the Archive directory size is set at 10 GB, multiple data sets can be temporarily stored in the Archive directory.

The Archive directory structure serves two purposes. First, the data stored in this directory structure is available for restoration into the Archive database which enables the data to be accessed for display via the Archive Product Display and Status Log GUIs. Second, the Archive directory structure maintains all the data and housekeeping information required to create an Archive CD-ROM.

7.2.2.2 Create Products Archive (Write Data to CD-ROM). The Create Archive function, activated via the OPUP Manager (administration) GUI - OPUP Archive Menu, copies the temporarily stored Archive data set (product and status data along with all necessary housekeeping information) from the Archive directory to a CD-ROM.

Each CD-ROM can store approximately 700 MBytes of data.

7.2.2.3 Restore Products Archive (from CD-ROM). The Restore Archive function, activated via

the OPUP Manager (administration) GUI - OPUP Archive Menu, copies previously recorded Archive data sets (product and status data along with all necessary housekeeping information) from CD-ROM back into the Archive directory structure. Once in the Archive directory these data are available to populate the Archive data base by selecting the (**Status and Control GUI) Restore** button.

7.2.2.3.1 Restore (Archive Data Base). The Restore Archive function populates the Archive database with the product and status data contained in the Archive data set. Once populated into the database, these data are available for display via the Archive display GUIs. The operational **Product Display** and **Status and Control GUIs** ONLY access the operational data base, while the Archive Product Display and Archive Status Log GUIs only have access to the Archive database. This precludes old data being displayed along with current information on the operational or Archive OPUP display GUIs.

NOTE

The Archive database is separate from the operational product database and is not automatically purged.

Section 7.3. ARCHIVE GUI

7.3.1 Introduction.

The Archive GUI provides for the specification of product types, source RPG(s), and inclusive time span to define the Archive session. Once defined the Archive function will copy the data that fit the above criteria into the Archive directory. The Archive directory will store multiple data sets.

Previously stored Archive data sets may be read into the Archive data base via the Restore Archive Data GUI and displayed on the Archive Product Display and Status Log GUIs for training or other uses as deemed appropriate.

7.3.2 Launching the Archive GUI.

Select the **Archive** button located on the launch bar of the **Status and Control** GUI. Selecting this button launches the Archive GUI (Figure 7-1) as a child window to the Status and Control window.

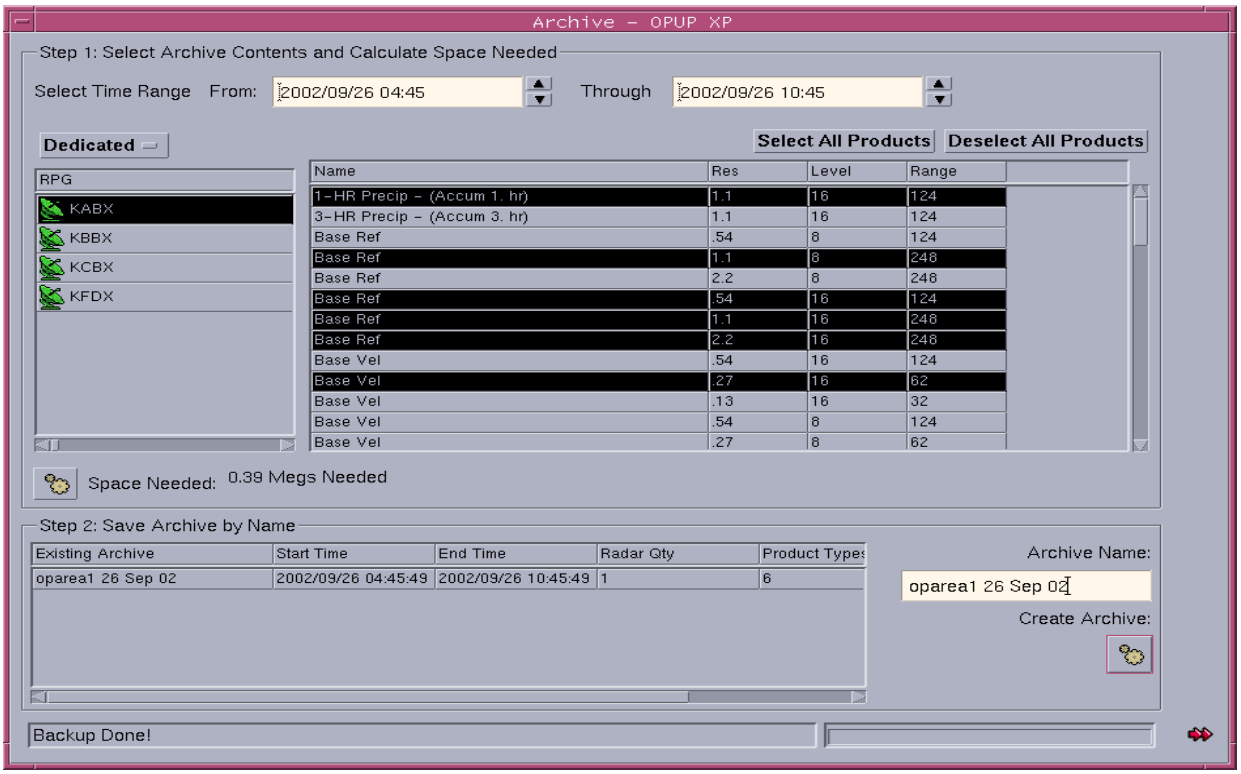


Figure 7-1. Archive GUI

7.3.3 Archive GUI Overview.

The Archive GUI provides control for all operator-level Archive IV data storage functions. To facilitate easy operator interaction, the Archive GUI is divided into Steps. Within each step, the GUI employs selectable listings, editable fields, and control icons.

7.3.3.1 Step 1: Select Archive Contents and Calculate Space Needed. This area is used to specify the inclusive times, source RPG(s), and product type(s) used to define the Archive data set.

7.3.3.1.1 Select Time Range Fields. The From and Through specify the inclusive date/time for defining the data set. The Though field defaults to the current time and the From field defaults to 6 hrs earlier.

The date/time fields may be modified by manually entering the desired date/time information or by selecting the appropriate arrow.

Up Arrow -	A mouse click will advance the time 1 minute
	A **right** mouse click will advance the time 5 minutes
Down Arrow -	A mouse click will decrement the time 1 minute
	A **right** mouse click will decrement the time 5 minutes

7.3.3.1.2 RPG(s) Selection Area. The RPG list box provides an alphabetical listing of WSR-88Ds, according to the selected RPG-type, by their 4 letter station identifier. The contents of this window are controlled by the RPG selection button. Options under this button are: Dedicated, AOR (non-associated RPGs in and immediately surrounding your area of responsibility), and All (Others) which lists all remaining non-associated RPGs.

Once the window is populated according to the selected RPG-type, the operator may select the RPG or RPGs of interest. Multiple RPGs may be selected by using the **<Shift>** and/or **<Ctrl>** (Control) keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two RPG IDs will select (highlight) all the RPGs between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired RPG will select (highlight) the individual RPG for inclusion in the selected set.

7.3.3.1.3 Product Selection Area. This area allows the operator to specify individual unique product definitions for inclusion in an Archive data set.

Individual WSR-88D products are characterized by product type (e.g., reflectivity, velocity, etc.), data resolution (e.g., .13 nm, 2.2 nm, etc.), and data level (viz., 0, 5, 8 or 16).

NOTE

The Range parameter is tied directly to the data resolution for a particular product. The product's display range (Range) is provided for information only.

The product selection portion of the `Archive` GUI provides an alphabetical listing of all WSR-88D product types. From this listing an individual (single) product may be selected by clicking on a desired product name. Multiple products may be selected by using the **<Shift>** and/or **<Ctrl>** (Control) keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two products will select (highlight) all the products between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired product will select (highlight) the individual product for inclusion in the selected set.

Additionally, the **Select All Products** button will automatically select (highlight) all product types for inclusion in the data set definition.

NOTE

The **Deselect All Products** button deselects all products in the list regardless of how each individual product was selected.

7.3.3.1.4 Space Needed: Calculation. Due to OPUP's database structure and product/data storage design, each Archive data set must be defined, saved and copied as an inclusive set - not as a conglomerate consisting of many independent parts (e.g., products, status messages, database pointers, linear buffers, etc.). Therefore, Archive data sets are restricted in size to no more than 700MB to ensure that each Archive case (data set) can be transferred, intact, to a single CD-ROM disk.

Once the data set definition parameters (viz., inclusive time, source RPG(s) and products) have been defined, the space needed to store this information can be determined. Selection of the **Space Needed** button results in the calculation and display of the total disk space needed to store the defined Archive data set.

NOTE

Calculating the required disk space takes several seconds. While the OPUP is performing the calculation, the status message; "Calculating Space Needed -- this will take a moment", is displayed at the bottom of the Archive window. Once the calculation is complete, this message is replaced by a message stating how much space is needed and the number of products included in the data set definition.

If the space needed exceeds 700 MB, modification of the data set definition parameters is required to reduce the storage space needed to save the data set. The best approach is to reduce the inclusive time and save the event as two data sets. For example if an event spans several hours, define the first Archive data set to include the first 1/2 of the total event time and define the second set to include the remaining time interval required to complete the event.

7.3.3.2 Step 2: Save Archive by Name. This area lists the names and pertinent information of each Archive data set currently available in the Archive directory structure and provides the interface to name newly defined Archive data sets.

7.3.3.2.1 Existing Archive (Directory List). This area provides the name of each locally stored (on the server's hard disk) Archive data set. Additionally, for each data set the start time/end time, number of radars, and number of product types are provided. This list may be reordered by selecting a column header which provides a new sort condition. This list is for information only.

7.3.3.2.2 Archive Name:. This text box is used to provide the name for a newly defined Archive data set. The name may be up to 256 characters and may include spaces and any combination of letters and characters.

NOTE

To ensure that each name is unique the OPUP software automatically adds the OPUP ID and the current date/time to the operator specified name when the data are written to the Archive directory structure. This additional information is only used internally and is not visible to the operator.

7.3.4 Controls and Indicators.

Operator interaction with the Archive GUI is via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon directly under the cursor. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

7.3.4.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to either the current active process or the user access level are de-sensitized (greyed-out in appearance). A brief explanation/definition of each icon presented on the Archive GUI is provided below:

Up Arrow

This selection increments the time forward. Clicking the mouse increments the time by 1 minute. Clicking the **right** mouse increments the time by 5 minutes.

Down Arrow

This selection decrements the time backward. Clicking the mouse decrements the time by 1 minute. Clicking with the **right** mouse decrements the time by 5 minutes.

Space Needed

Selection of the **Space Needed** button results in an estimate of the amount of disk space required to store the defined Archive data set. This space MUST be less that 700 MB.

Create Backup

The **Create Backup** button initiates the copy process to copy the Archive data set to the reserved Archive directory structure on the OPUP server hard disk. This function DOES NOT copy the data to the exportable media.

Exit

Exits the Archive GUI application.

Section 7.4. RESTORE GUI

7.4.1 Introduction.

The (Archive) Restore GUI provides for the selection of the desired previously stored Archive data set to read into the Archive data base. Once read into the data base these data are available for display on the **Archive Product Display** and **Status Log** GUIs.

7.4.2 Launching the (Archive) Restore GUI.

Select the **Restore** button located on the launch bar of the **Status and Control** GUI. Selecting this button launches the Restore GUI (Figure 7-2) as a child application to the Status and Control GUI.

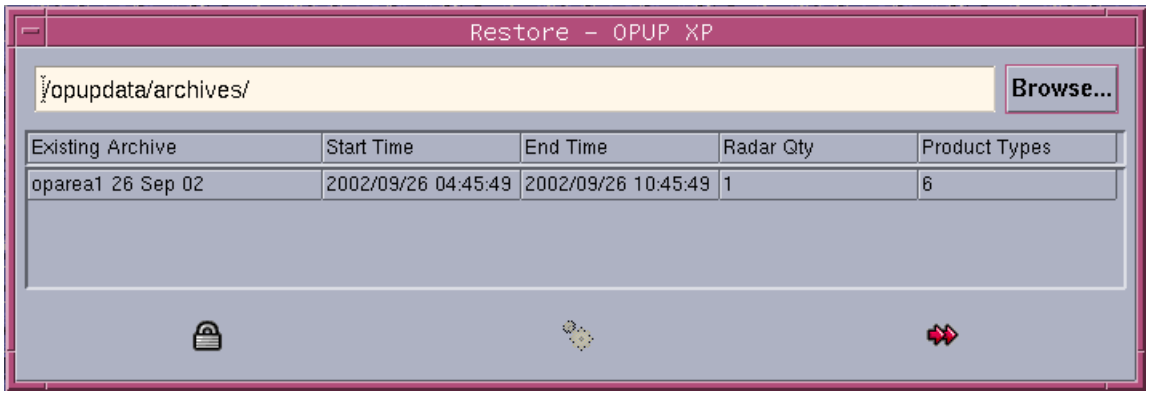


Figure 7-2. Restore GUI

7.4.3 (Archive) Restore GUI Overview.

The (Archive) Restore GUI provides a listing of all Archive data sets available in the OPUP Archive directory structure. This listing provides the name of each locally stored (on the server's hard disk) Archive data set. Additionally, for each data set the start time/end time, number of radars, and number of product types are provided. This list may be reordered by selecting a column header which provides a new sort condition.

After selecting the data set of interest the **Restore Archive** button populates the Archive data base with the products and status messages from this set.

7.4.4 Controls and Indicators.

Operator interaction with the (Archive) Restore GUI is via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon directly under the cursor. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

7.4.4.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to either the current active process or the user access level are de-sensitized (greyed-out in appearance). A brief explanation/definition of each icon presented on the (Archive) Restore GUI is provided below:

Restore Archive

The Restore Archive button populates the Archive data base with data previously stored from the reserved Archive directory structure. These data may have been read from CD-ROM or may have been just recently been Archived.

Exit

Exits the (Archive) Restore GUI application.

Section 7.5. OPUP ARCHIVE DATA SET CREATION PROCEDURES

7.5.1 Introduction.

The Archive GUI enables the operator to specify the inclusive times, source RPGs and product types for defining the data to comprise an Archive data set. After specifying the appropriate parameters to define an Archive data set, the Archive application copies the selected products, status data, and housekeeping information to the reserved Archive directory structure. The act of saving a data set from the Archive GUI only results in these data being copied to a reserved location on the OPUP server hard drive, it does not result in the data being copied the exportable Archive media (CD-ROM disk). Copying the data set to the CD-ROM device in accomplished via the OPUP Manager (Administration) GUI.

7.5.2 Saving a Specific Data Set for Archive.

1. Open the Archive GUI window by click on the **Archive** button located on the OPUP Status and Control Launch bar. The Archive GUI is displayed.
2. Using the up/down arrows, increment/decrement the From and Through fields to encompass the date and time of the event of interest. The date and time entries may be entered via the keyboard by typing the date and time as:

   yyyy/mm/dd hh:mm

3. Populate the RPG window so that the RPG(s) of interest are available for selection.

NOTE

The contents of the RPG window are controlled by the RPG selection button. Options under this button are: Dedicated, AOR (non-associated RPGs in and immediately surrounding your area of responsibility), and All (Others) which lists all remaining non-associated RPGs).

4. Select the RPG of interest by clicking on the RPG 4-letter identifier.

NOTE

Multiple RPGs may be selected by using the **<Shift>** and/or **<Ctrl>** (Control) keys:

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two RPGs will select (highlight) all the RPGs between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired RPG will select (highlight) the individual product for inclusion in the selected set.

5. Select the product or products of interest by following the guidance below:

- To select all products, simply click the **Select All Products** button. This action will automatically select (highlight) all product types for inclusion in the data set definition.
- The **Deselect All Products** button deselects all products in the list regardless of how each individual product was selected.
- To select an individual (single) product click on a desired product name.
- To select multiple products use the **<Shift>** and/or **<Ctrl>** (Control) keys.

  <Shift> - Depressing and holding down the **<Shift>** key while clicking on two products will select (highlight) all the products between and including the selected ones.

  <Ctrl> - Depressing and holding down the **<Ctrl>** key while clicking on desired product will select (highlight) the individual product for inclusion in the selected set.

6. Click on the **Space Needed** button. The application calculates the amount of disk space required to store the defined Archive data set. This process may take a minute or longer to complete. Once completed, the feedback `XX.XX Megs Needed` is displayed next to the Space Needed: label and in the status area at the bottom of the `Archive` GUI.

- If the needed space exceeds the 700 MB:
  - a feedback message stating how much space is need for the selected data is displayed,
  - the **Create Archive** button is not activated and its Tool Tip states `Disabled: XXX.X Megs Needed only 700 Megs available`. Modification of the data set definition parameters is required to reduce the storage space needed to save the data set. One approach is to modify the inclusive times and save the event as two data sets.

7. Click in the Archive Name text box to activate the box.
8. Enter a descriptive name for the Archive data set.
9. Click on the **Create Archive** button. The Archive data set is copied to the reserved Archive directory structure for future use. ***The process may take several minutes to complete***.

NOTE

This function **DOES NOT** copy the data to the exportable media. Copying the Archive data set to CD-ROM is accomplished via the OPUP Manager (Administration) GUI.

Section 7.6. ARCHIVE DATA SET RESTORE AND DISPLAY PROCEDURES

7.6.1 Introduction.

Previously stored Archive data sets may be read into the Archive data base via the Restore (Archive Data) GUI. Once these data are restored into the Archive data base they are available for viewing using the **Archive Product Display** and **Archive Status Log** GUIs.

7.6.2 Restoring an Archive Data Set.

Prerequisite: This procedure assumes the Archive data set of interest is available in the reserved directory structure and therefore will be listed as an Existing Archive on the Restore GUI. If this is not the case, see NWS EHB 6-537 (Large/Medium OPUP Configurations) and NWS EHB 6-538 (Small OPUP Configurations)) for procedures on retrieving an Archive data set from CD-ROM.

1. Open the Restore GUI window by clicking on the **Restore** button located on the OPUP Status and Control Launch bar. The Restore GUI is displayed.
2. Select the Archive data set of interest from the list of Existing Archive set by clicking on the set name. The line including the set name and pertinent information is highlighted in inverse video.
3. Click on the **Restore Archive** button. The Archive data base is populated with the data from the selected Archive data set.

These data are now ready for viewing via the **Archive Product Display** and **Archive Status Log** GUIs.

7.6.3 Displaying Data from an Archive Data Set.

Prerequisite: This procedure assumes the Archive data set of interest is currently available in the reserved Archive data base. If this is not the case, see paragraph 7.6.2.

1. Ensure there are no active OPUP applications for this login session. The OPUP will not allow simultaneous display of current and archive GUIs.
2. Launch the Archive Product Display GUI by clicking on the **Archive Product Display** icon, located on the right side of the work space window Front Panel. This action loads and starts a new, independent, instance (one instance per login user name) of the Archive Product Display GUI software for this login.

NOTE

The Archive Product Display GUI has the same look and feel as the real-time Product Display GUI. All product display and manipulation functions that are available on the real-time Product Display GUI (except for auto-update) are also

available on the Archive Product Display GUI. However, some operational functions that do not make sense for archived data review (e.g., OTRs, alerts, auto-dial, etc.) are not available and are not executable (greyed out) via the Archive Product Display GUI. For information and instructions on product display and manipulation, reference Section 4.5.

7.6.4 Displaying Status Data from an Archive Data Set.

Prerequisite: This procedure assumes the Archive data set of interest is currently available in the Archive data base. If this is not the case, see paragraph 7.6.2.

1. Ensure there are no active OPUP applications for this login session. The OPUP will not allow simultaneous display of current and archive data.
2. Launch the Archive Status Log GUI by clicking the **Archive Status Log** icon, located on the right side of the work space window Front Panel. This action loads and starts a new, independent, instance (one instance per login user name) of the Archive Status Log GUI for this login.

NOTE

The Archive Status Log GUI provides the same information as the real-time System Status GUI. Manipulation of the information in the Status Log GUI (except for Show All Messages, which is not available) is the same as for the System Status GUI. For information and instructions, reference Section 6.5.

CHAPTER 8
OPUP AUTO-DIAL FEATURE

Section 8.1. INTRODUCTION

8.1.1 General.

Chapter 8 provides an overview of the OPUP Auto-Dial feature. Additionally, Chapter 8 provides detailed procedures for modifying and managing OPUP Auto-Dial requests.

8.1.2 Chapter Organization.

Chapter 8 is organized into four sections as follows:

- Section 8.1. INTRODUCTION - Provides a brief description of each section found in Chapter 8.
- Section 8.2. OPUP AUTO-DIAL FEATURE - Provides an overview of the Auto-Dial feature.
- Section 8.3. AUTO-DIAL GUI - Provides definitions of all the Auto-Dial GUI functions and icons.
- Section 8.4. AUTO-DIAL PROCEDURES - Provides step-by-step procedures for executing the most common Auto-Dial GUI functions.

Section 8.2. OPUP AUTO-DIAL FEATURE

8.2.1 Introduction.

The purpose of the OPUP Auto-Dial feature is to automate the process of obtaining products from non-associated RPGs.

8.2.2 Auto-Dial Feature.

The OPUP Auto-Dial feature is designed to repeatedly dial-out and request a predefined product set from one or more non-associated RPG(s). When activated, the OPUP Auto-Dial feature will automatically dial into the specified RPG, request the predefined product set, disconnect, wait for the user-specified time period, then re-initiate the dial-request sequence. This dial - request - disconnect - wait sequence will repeat until canceled by operator command.

NOTE

> To process a request to an associated RPG whose dedicated line has failed, you MUST first “Disconnect” the failed line (via the Status and Control GUI, see paragraph 6.4.4.2.2). This action disables the router port which then allows a connection via the dial module.

The OPUP Auto-Dial feature will store up to 20 product sets of 10 products each for dial request processing. Level 1 password access is required to save, modify, rename, and delete an autodial product set. Level 1 access is also required to initiate an autodial instance. However, any operator (no special access) may stop an autodial instance and may view a saved or active autodial request list.

To initiate an automated dial sequence, select the desired product list, identify the target RPG and specify the desired wait interval, between 5 and 300 minutes. These selections define an auto-dial instance. The OPUP software will support up to 25 simultaneous, active auto-dial instances. An indication of an active instance is displayed on the Product Display GUI (Figure 4-7).

Section 8.3. AUTO-DIAL GUI

8.3.1 Introduction.

The Auto-Dial GUI provides for the creation, modification, and control of dial product request lists. Access to some Auto-Dial GUI functions are limited by access level and password.

8.3.2 Graphical Icons.

The use of graphic icons to execute commands and functions is used extensively throughout the OPUP Applications Graphical User Interface design. Icons that are not valid selections due to the current active process or the user access level are de-sensitized (greyed-out in appearance).

The definition for each icon is provided under the sections describing the individual GUI where it is available.

8.3.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names (like passwords, IP addresses, site specific IDs, etc.) are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all command portions that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with an actual name, address, password, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

8.3.4 Launching the Autodial GUI.

The Auto-Dial GUI is a main function of the OPUP operational software suite. To activate the Auto-Dial GUI, from the OPUP desktop, position the cursor over the Auto-Dial button on the Launch Bar of the Status and Control GUI (see Section 6.3). This action loads and starts a new, independent, instance of the Auto-Dial GUI software for this workstation. The access to view the information provided by this GUI is not restricted; however, editing of product request sets, modification of saved sets, and initiating the auto-dial function are restricted by access level and password.

8.3.5 Auto-Dial GUI Overview.

The OPUP provides for defining and saving up to 20 product request sets for future use. These stored sets, known as Saved Sets may define a single product or a list of up to 10 products. Saved sets may be invoked as requests to a single RPG or the same set may be sent to multiple RPGs. Care should be taken when naming individual sets to ensure the operator can differentiate between those sets designed for specific weather or RPGs and those designed as general purpose sets.

NOTE

Only one Auto-Dial instance per RPG is allowed.

The Auto-Dial GUI (Figure 8-1) is divided into four distinct areas. Each window passes data to the adjacent window(s) as indicated by the blue data flow arrows.

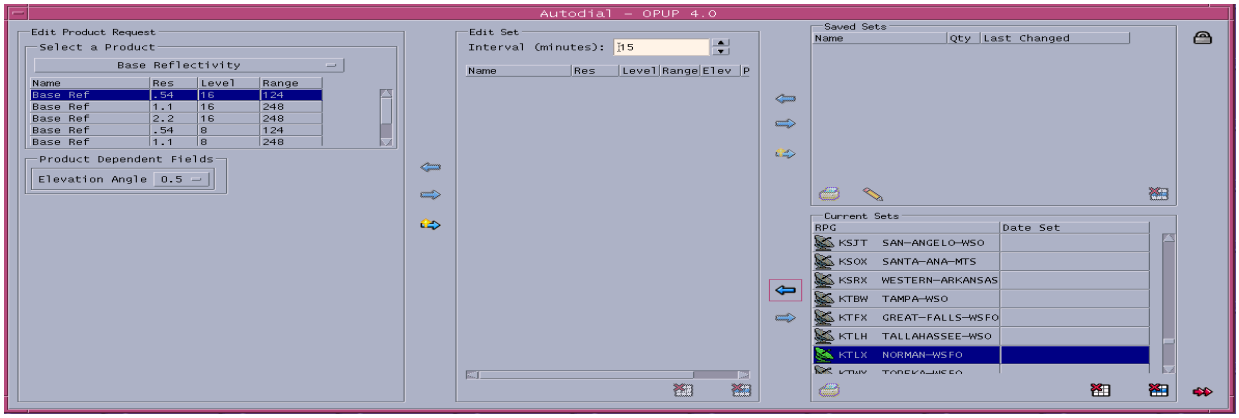


Figure 8-1. Auto Dial GUI

8.3.5.1 Edit Product Request Window. The `Edit Product Request` window allows the operator to specify individual unique product definitions for inclusion in a product set. The specific functions of the window include product type selection, distribution priority selection, and product dependent parameters definition.

8.3.5.1.1 Select a Product. Individual WSR-88D products are characterized by product type (e.g., reflectivity, velocity, etc.), data level (viz., 8 or 16), and data resolution (e.g., .13 nm, 2.2 nm, etc.). The Select-a-Product portion of the Auto-Dial GUI provides a listing of all WSR-88D product types. When a specific type is selected, the operator is presented the valid data level and resolution options to identify the unique WSR-88D product.

NOTE

The Range parameter is tied directly to the data resolution for a particular product. In the Auto-Dial GUI, the product's display range (Range) is provided for information only and is not an editable selection.

8.3.5.1.2 Product Dependent Fields. In addition to the general product characteristics of product type, data level and resolution, many WSR-88D products require additional parameters (e.g., elevation angle, storm speed/direction, etc.) to define them as unique products. See Table 3-1, for a complete list of available products and attendant parameters. The Product Dependent Fields section of the `Edit Product` window allows the operator to specify these parameters to ensure the exact product is generated by the RPG.

When a product type that allows additional product dependent parameters is selected in the Select-a-Product section, the Product Dependent Fields section updates to present the operator with the valid selections pertaining to that product. The Product Dependent Fields are:

- `Elevation Angle` - Defines the specific slice to derive the product.
- `Storm Speed` - Along with Storm Direction, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Storm Direction` - Along with Storm Speed, defines the velocity vector to be subtracted from the base velocity field to produce a storm-relative velocity field.
- `Azimuth` - Defines the azimuth angle (from the RDA) and is used in conjunction with Range to define a location for a product center or end point.
- `Range` - Defines the range (from the RDA) and is used in conjunction with Azimuth to define a location for a product center or end point.
- `Altitude` - Defines the altitude MSL for Velocity Azimuth Display product definition.
- `Start Time` - Defines the starting hour and is used in conjunction with Duration to define the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Duration` - Used in conjunction with Start Time, defines the hours for inclusion in a User Selectable Precipitation (USP) product definition.
- `Lowest Map` - Specifies Elevation Segment 1 for the Clutter Filter Control product definition. Elevation Segment 1 includes all elevation angles below 2 degrees.
- `Upper Map` - Specifies Elevation Segment 2 for the Clutter Filter Control product definition. Elevation Segment 2 includes all elevation angles at 2 degrees and above.
- `Surveillance` - Specifies the Surveillance Channel for the Clutter Filter Control product definition.
- `Doppler` - Specifies the Doppler Channel for the Clutter Filter Control product definition.

8.3.5.2 Edit Set Window. The `Edit Set` window displays either the product set being edited, the contents of the Current Set for the selected RPG, or the contents of the selected Saved Set. The specific product request set presented in this window is selectable by the operator.

8.3.5.2.1 Interval (minutes). This entry defines the wait interval - the time between the completion of the last dial-request and the initiation of the subsequent request. The interval may be set for a minimum of 5 minutes up to a maximum of 360 minutes.

8.3.5.2.2 Product Definitions. Product definitions from the `Edit Product Request` window are used to build and/or modify lists displayed in the `Edit Set` window. The interface for this window allows the operator to add new product definitions or to modify the parameters of a selected product. Additionally, the interface will not allow duplicate products to be added to a list.

The order of listed products may be changed by selecting the desired sort parameter (e.g., Name, Res, Level, etc.) in the column header. The listed order has no effect on the request list or the availability of any products; it only affects the displayed order.

Regardless of the origin of the displayed request set, the following information is available for each product.

8.3.5.2.2.1 Name. An abbreviated WSR-88D product name specifying the basic product type.

8.3.5.2.2.2 Res. The data resolution used to produce the specific product, if applicable.

8.3.5.2.2.3 Level. The number of displayable product data levels for the specific product.

8.3.5.2.2.4 Range. The maximum displayable range of the product (based on the product resolution).

8.3.5.2.2.5 Elev. The specific elevation angle (horizontal slice of the atmosphere) of the data collected to produce the product. The field is listed as N/A for products that require multiple elevation angles (e.g., Composite Reflectivity, etc.). If the listed elevation angle is not a valid selection for the active volume coverage pattern, the RPG will generate and send a product from the closest valid elevation angle.

8.3.5.2.2.6 Priority. The narrowband transmission priority. This entry governs the relative product order within the distribution queue when more than one product is waiting to be sent down the RPG-to-OPUP narrowband line. The Priority is for informational purposes only and is not an editable parameter.

8.3.5.3 Saved Sets Window. The OPUP will store up to 20 predefined Auto-Dial request sets. Predefined sets are listed in the `Saved Sets` window. These predefined sets may used to request products from any radar. The order of listed sets may be changed by selecting the desired sort parameter (viz., Name, Qty, or Last Changed) in the column header. The listed order has no effect on the list contents, it only affects the displayed order.

Regardless of the display order, the following information is available for each set.

8.3.5.3.1 Name. Any unique combination of letters, numbers, spaces, or characters, up to maxi-

mum of 256 characters, to describe the content or applicability of the particular product set.

8.3.5.3.2 Qty. The total number of individual product definitions contained within the product set.

8.3.5.3.3 Last Changed. The date and time of the most recent change/modification of the product set. If the set is new, then this date/time entry reflects the date and time the set was saved.

8.3.5.4 Current Sets Window. The `Current Sets` window lists all available WSR-88Ds. The order of listed RPGs may be changed by selecting the desired sort order (viz., RPG, Date Sent, Name) in the column header. The listed order has no effect on the list contents, it only affects the displayed order.

This window allows the operator to identify a radar of interest. Once a radar has been identified, this window interacts with the `Edit Set` window to enable the operator to send a specific Saved Set or modified set to the selected radar. Saving a request set to the `Current Sets` window activates the Auto-Dial function. Once active, the Auto-Dial function repeatedly executes requests for the defined product set, at the specified interval, until deactivated by user interaction.

NOTE

> To process a request to an associated RPG whose dedicated line has failed, you MUST first "Disconnect" the failed line (via the Status and Control GUI, see paragraph 6.4.4.2.2). This action disables the router port which allows a connection via the dial module.

Additionally, the operator can view the currently active request set for a specific radar by interacting with the `Edit Set` window to populate it with the Current Sets definition for the selected radar.

The `Current Sets` window includes the following fields:

8.3.5.4.1 RPG. A color-coded radar icon with the four letter radar site identification is listed for every WSR-88D. The radar icon color reflects the radar current state as derived from the General Status Message last received from that radar. The possible icon colors and related statuses are:

- GREEN - The OPUP-to-RPG narrowband line is connected and the OPUP is communicating with the RPG.
- GREY - The line is disconnected via command at the OPUP end.
- YELLOW - The OPUP-to-RPG narrowband line is connected; however, the RPG is reporting a loadshedding alarm and products may not be available. Additional status information should sought via the Status GUI.
- BRIGHT RED - The OPUP-to-RPG narrowband line is connected, however the RPG is reporting a critical failure and products are not available. Additional status information

should be sought via the Status GUI.

- BRICK RED - The OPUP-to-RPG narrowband line is PENDING (not connected). This is the normal state for non-associated RPGs. However, this is not desirable for associated RPG connections and further investigation is warranted.
- PURPLE - RPG side disconnected the communications link.
- LIGHT BLUE - The OPUP is dialing a non-associated RPG in response to a one-time product request generated via the Product Request GUI.
- BLUE - The OPUP has a dial-in connection to the RPG.
- WHITE - The message handler software task (mcu) is not responding. This is a serious communications failure and if the mcu does not recover will require a restart of the OPUP software to resolve.

8.3.5.4.2 Date Sent. This field provides the date and time the current RPS list was sent to the specific RPG.

8.3.5.4.3 Name. This entry provides the name of the current request set (if a Saved Set is active) for each RPG that is actively being contacted by the Auto-Dial function. This entry is blank for each RPG where the Auto-Dial function is not active.

8.3.6 Controls and Indicators.

Operator interaction with the Auto-Dial GUI is via mouse selection. Depressing the mouse selects (highlights) the option or executes the command/function represented by the icon directly under the cursor. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

8.3.6.1 Icons. To enhance the interface usability, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to either the current active process or the user access level are de-sensitized (greyed-out in appearance). A brief explanation/definition of each icon presented on the Product Request GUI is provided below:

Left Arrow

This selection populates the window to the left with the contents (parameters) of the selected entity on the right. This supports the editing of the current definitions for the selected entity. For example, the contents of a selected Saved Set will populate the `Edit Set` window.

Right Arrow

This selection overwrites (replaces) the selected item in the target (right) window with the new definition from the origin (left) window. In other words, the new product parameters defined in the `Edit Product Request` window will replace the product selected in the `Edit Set` window. Saving a request set to the `Current Sets` window also activates the Auto-Dial Process for the selected RPG.

Right Arrow And Plus

This selection adds the definition contained in the left window to the contents of the right window. For example, the product defined with particular parameters in the `Edit Product Request` window is added to the product list in the `Edit Set` window.

Up Arrow

Left-clicking this selection increments the numerical value in the entry box up by one. (Right-clicking increments the numerical value in the entry box up by 35.)

Down Arrow

Left-clicking this selection decrements the numerical value in the entry box by one. (Right-clicking decrements the numerical value in the entry box by 35.)

Print

Prints the contents of the selected Auto-Dial Set. See paragraph 8.3.6.3

Pencil

Provides the ability to name/rename a Saved Sets.

Stop Autodialing All RPGs

Deletes all product definitions in the Edit Set area.
Disables all active Auto-Dial functions.

Delete Saved Set And Stop Autodialing Selected RPGs

Delete Saved Set - Deletes the selected (highlighted) line.

Stop Auto-Dialing Selected RPG - Disables the active Auto-Dial function for the selected (highlighted) RPG.

Exit

Exits the Product Request application.

Padlock

When closed, indicates access Level 0. To change access level, click the padlock icon, select the desired access level, and enter the appropriate password. The access level will remain active until it is changed or the Product Request GUI is closed, at which time the access level is reset to Level 0.

8.3.6.2 Access Levels. There are four access levels within the OPUP structure to restrict access to system areas that may negatively impact operations.

8.3.6.2.1 No Special Access. Level 0, no special access, is the default level for all OPUP GUI screens and information. This level allows all users unlimited access to view information and data available on the OPUP system. This level does not allow the operator to edit, delete, or create adaptation data or other operationally sensitive parameters.

8.3.6.2.2 Level 1. Level 1 access is designed to allow the shift supervisor modification access to adaptation data and operational parameters that affect the current shift operation, but do not change or adversely affect the operation of the unit as a whole. Sending a predefined RPS list to selected RPGs is an example that requires Level 1 access.

8.3.6.2.3 Level 2. Level 2 access is the next step up in OPUP operational security. Level 2 access is designed to restrict access to adaptation data and operational parameters that impact or affect the entire unit operations. An example of parameters that require Level 2 access is Alert Criteria selection. The selection of alert criteria values affect all users of OPUP that rely on or expect notification from the WSR-88D alerting feature.

8.3.6.2.4 Level 3. Level 3 is the highest security level available in OPUP. Level 3 access is considered supervisory level and includes items like non-associated RPG passwords and phone numbers. Adaptation data and parameters that require Level 3 access are rarely changed and may adversely impact OPUP operations if due care is not exercised.

8.3.6.3 Print. Two print icons are provided on the Product Request GUI. Selecting either icon results in the display of a print dialog. The print dialog enables the user to select either landscape or portrait print presentation and to select any configured printer.

Section 8.4. AUTO-DIAL PROCEDURES

8.4.1 Introduction.

This section provides step-by-step procedures for creating, editing and invoking auto-dial requests.

8.4.2 Procedures.

The following procedures, used in conjunction with the **Stop Autodialing All RPGs** and the **Stop Autodialing Selected RPGs** icons provide for complete operator control of the Auto-dial function.

8.4.2.1 Create an Auto-Dial Product Request Set.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns green and unlocks.
3. In the `Edit Product Request` window, select the desired product type from the Select a Product drop-down product list. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
4. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

5. Use the increment arrows to specify the desired wait interval time.
6. Click the **Plus/Arrow** (Add New Product to Edit Set) located between the `Edit Product Request` and `Edit Set` columns.
7. Ensure the new product definition now appears in the `Edit Set` window.
8. Repeat Steps 3 through 6 until all desired products are included in the `Edit Set` window.
9. Save this list by clicking the **Plus/Arrow** (Save New Set) located between the `Edit Product Request` window and the `Edit Set` window.
10. Ensure a new set, identified as Canned Set, containing the number of products specified in the `Edit Set` window, and tagged with the current date/time is now listed in the `Saved Sets` window.
11. Click on the name **Canned** in the `Saved Sets` window. This action selects the specific set and highlights it in inverse video.
12. Click on the **Pencil** (Rename Saved Set) icon.

13. In the drop-down dialog box type a unique name for the new saved set. This name may be any letter/number combination up to 256 characters long.
14. Click **OK**. Ensure the title of the set is renamed from Canned to the character string that you entered.
15. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

8.4.2.2 Send a Predefined (Saved Set) Auto-Dial Product Request Set.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns green and unlocks.
3. In the `Saved Sets` window, click on the name of the set of interest. The set name and associated information will be highlighted in inverse video.
4. Click on the **Left Arrow** between the `Saved Sets` window and the `Edit Set` window. The contents of the selected saved set will display in the `Edit Set` window.
5. To send this request set, click on the RPG ID. The RPG ID and associated information is highlighted in inverse video.

NOTE

To process a request to an associated RPG whose dedicated line has failed, you MUST first "Disconnect" the failed line (via the Status and Control GUI, see paragraph 6.4.4.2.2). This action disables the router port which allows a connection via the dial module.

6. Click on the **Save Current Set** arrow icon. This action initiates the dial-out function and forwards the request list to the selected RPG.
7. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

8.4.2.3 Modify (Edit) and Send a One-Time Product Request Set. The following procedures may be used to edit a temporary Auto-Dial set, modify a previously saved Auto-Dial set, or create a new Auto-Dial set by modifying the products and/or product parameters of a previously saved Auto-Dial set. This new set may be transmitted to any RPG as a temporary Auto-Dial set; however, to save these edits for future use (Save New Set), you must select the appropriate **Save** arrow (viz., Save Set or Save New Set).

Three procedures are provided in this section: Add a Product to an Auto-Dial List, Modifying the Parameters of a Product in an Auto-Dial List, and Delete a Product from an Auto-Dial List. The operator should use the steps from any or all three procedures to accomplish the appropriate modifications to the Auto-Dial set definition.

8.4.2.3.1 Add a Product to an Auto-Dial List.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click OK.
2. Ensure the **Padlock** icon turns green and unlocks.
3. In the `Saved Sets` window, click on the desired Auto-Dial set. The target Auto-Dial set is highlighted in inverse video.
4. Click the **Left Arrow** (Edit Selected Set) between the `Edit Set` and `Saved Sets` columns. This action populates the `Edit Set` window with the current contents of the selected Saved Set.
5. In the `Edit Product Request` window, select the desired product type from the Select a Product drop-down product list.
6. Click on the row that specifies the appropriate resolution and data level product definition, if applicable.
7. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

8. Click the **Plus/Arrow** (Add New Product to Edit Set) located between the `Edit Product Request` and `Edit Set` columns.
9. Ensure the new product definition now appears in the `Edit Set` column.
10. Repeat Steps 6 through 9 until all desired products are listed in the `Edit Set` window.

To delete individual product definitions from the request list, see the procedure in paragraph 8.4.2.3.3. To modify selected product parameters, see the procedure in paragraph 8.4.2.3.2.

11. To send this request set, click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
12. Click on the **Save Current Set** icon. This action initiates the Auto-Dial feature and forwards the request list to the selected RPG.
13. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

8.4.2.3.2 Modify the Parameters of a Product in an Auto-Dial Set. This procedure may also be used to replace a specific product with a new product of a different product type.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.

2. Ensure the **Padlock** icon turns green and unlocks.
3. In the `Saved Sets` window, click on the desired Auto-Dial set. The target Auto-Dial set is highlighted in inverse video.
4. Click the **Left Arrow** (Edit Selected Set) between the `Edit Set` and `Saved Sets` columns. This action populates the `Edit Set` window with the current contents of the selected Saved Set.
5. In the `Edit Product Request` window, select the desired product type from the Select a Product drop-down product list.
6. In the `Edit Set` window, click on the product whose parameters require modification. This will highlight the selected product and its associated parameters in inverse video.
7. Click the **Left Arrow** (Edit Selected Product) between the `Edit Set` and `Edit Product Request` columns.
8. Ensure the product parameters of the selected product are reflected in the `Edit Product Request` window.
9. Modify the appropriate product dependent parameter entries.

NOTE

You may type the desired entries into the edit fields.

10. Click the **Right Arrow** (Save Changes to Selected Product) located between the `Edit Set` and `Edit Product Request` columns.
11. Ensure the new product definition now appears in the `Edit Product Request` column.
12. Repeat Steps 7 through 11 until all desired product edits are listed in the `Products to Request` window.

To delete individual product definitions from the request list, see the procedures in paragraph 8.4.2.3.3. To add new products, see the procedures in paragraph 8.4.2.3.1.

13. To send this request set, click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
14. Click on the **Save Current Set** icon. This action initiates the Auto-Dial feature and forwards the request list to the selected RPG.
15. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

8.4.2.3.3 Delete a Product from an Auto-Dial Set.

1. Click on the **Padlock** icon (padlock in right side border). Select Level 1, enter your Level 1 password in the field, then click **OK**.
2. Ensure the **Padlock** icon turns green and unlocks.
3. In the Saved Sets window, click on the desired Auto-Dial set. The target Auto-Dial set is highlighted in inverse video.
4. Click the **Left Arrow** (Edit Selected Set) between the `Edit Set` and Saved Sets columns. This action populates the `Edit Set` window with the current contents of the selected Saved Set.
5. In the `Edit Set` window, click on the product that is no longer desired for inclusion in the Auto-Dial Set. This will highlight the selected product and its associated parameters in inverse video.
6. Click on the **Delete Selected Product** icon.
7. Ensure the selected product is deleted from the Auto-Dial Set list definition within the Edit Set listing.
8. Repeat Steps 5 through 7 until all undesired products have been deleted from the Auto-Dial Set listed in the `Edit Set` window.

To add new product definitions to the request list, see the procedures in paragraph 8.4.2.3.1. To modify selected product parameters, see the procedures in paragraph 8.4.2.3.2.

9. To send this request set, click on the target RPG ID. The RPG ID and associated information is highlighted in inverse video.
10. Click on the **Save Current Set** icon. This action initiates the Auto-Dial feature and forwards the request list to the selected RPG.
11. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to relock this GUI interface.

CHAPTER 9
ADAPTATION DATA CONTROL

Section 9.1. INTRODUCTION

9.1.1 General.

Chapter 9 provides an overview of the OPUP adaptation data philosophy, default values, and file structure. Additionally, Chapter 9 provides detailed procedures for modifying and managing OPUP adaptation data.

9.1.2 Chapter Organization.

Chapter 9 is organized into ten sections as follows:

- Section 9.1. INTRODUCTION - Provides a brief description of each section found in Chapter 9.
- Section 9.2. OPUP ADAPTATION DATA - General philosophy of OPUP adaptation data.
- Section 9.3. ADAPTATION DATA GUI - Provides a description on the OPUP Adaptation Data edit GUI.
- Section 9.4. DISPLAY TAB - Allows tailoring of the Storm Track Information (STI), Hail Index (HI), and the Tornado Vortex Signature (TVS) product displays.
- Section 9.5. MAPS TAB - Allows the designation of default map-to-product associations.
- Section 9.6. OVERLAYS TAB - Allows the designation of default overlay-to-product associations.
- Section 9.7. COLORS TAB - Provides for the definition of custom colors and color pallets.
- Section 9.8. FTP DIST(RIBUTION) TAB - Provides for the identification and modification of target distribution server addresses.
- Section 9.9. NITF/NEXRAD/PNG DISTRIBUTION TABS - Allows for the identification of products to be converted for FTP distribution.

Section 9.2. OPUP ADAPTATION DATA

9.2.1 Introduction.

The OPUP adaptation data are used to customize the operation and functionality of the OPUP to support the requirements of individual operators and offices.

The adaptation data are specifically designated apart from applications software files and user profiles to facilitate recovery following a software upgrade or major hardware failure that forces a reload of OPUP software.

9.2.2 Saving and Restoring Adaptation Data.

Adaptation data can be saved to CD-ROM media via the OPUP Manager (Administration) tool. These data should be routinely saved when changes are made to the operational adaptation data parameters.

Saving and restoring adaptation data is done as part of system recovery and the required steps are provided in the OPUP Administration (Admin) chapter of the OPUP Maintenance manual.

Section 9.3. ADAPTATION DATA GUI

9.3.1 Introduction.

The OPUP Adaptation Data editor user interface design is based on the familiar windows-like graphical user interface paradigm.

9.3.2 Graphical Icons.

Graphic icons to execute commands and functions are used extensively throughout the OPUP Adaptation Data editor design. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance).

The definition for each icon is provided under the section describing the individually tabbed GUI.

9.3.3 Mouse.

A three button mouse is used as the standard pointing/cursor control device for OPUP. As with most window-style programs, the left button is used to issue/execute command selections. The word **click** indicates a standard **left mouse click**. When a **right, middle** or **double** click is required, it is specifically indicated. Command entries and mouse selections are shown in this section in **bold** type (e.g., **typed command**). Variable names (like passwords, IP addresses, site specific IDs, etc.) are normally shown with a unique font (e.g., `variable_name`). Within a specified command string that must be entered, the variable placeholders are not bold type; however, all portions of the command that are entered exactly as shown are in bold type. The variable placeholder within the command string must be replaced with an actual name, address, password, etc., unique to each system and the user is told how to formulate the entry, or directed to where to find this information. Unless stated otherwise, each command line shown must be entered to be processed. Also, directory names/paths shown outside of a command example are *italicized* for clarity purposes (e.g., */export/home/opupmgr*). Screen graphical selections will be identified in the following manner.

- Icon and Arrow actions are identified in **bold** type (e.g., **Zoom In**, **Left**).
- Keyboard keys are identified in **bold** type (e.g., **<Shift>**).

9.3.4 OPUP Adaptation Data Editor GUI.

9.3.4.1 Launching the OPUP Adaptation Data Editor GUI. Select the **Adaptation** button located on the launch bar of the Status and Control GUI. Selecting this button launches the Adaptation Data editor GUI (Figure 9-1) as a child window to the `Status and Control GUI` window.

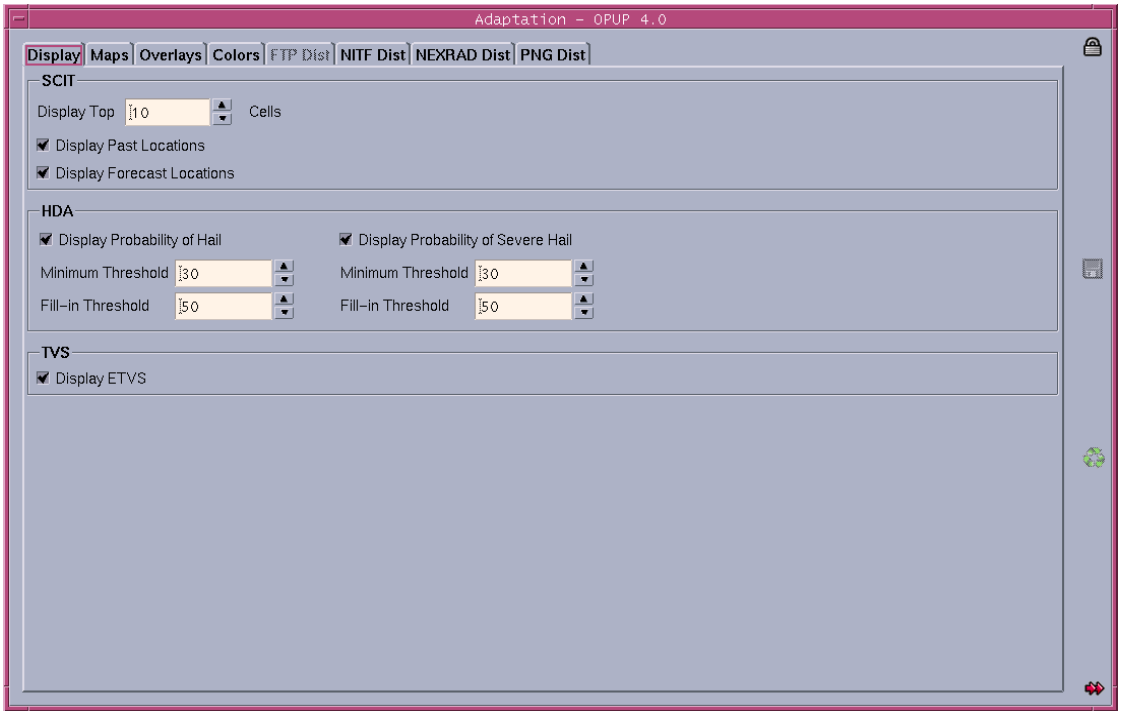


Figure 9-1. Adaptation Data Editor GUI

9.3.4.2 Tabs. Particular adaptation data edit screens are accessed by selecting the appropriate tab. Individual sections in this chapter describe the editable parameters available through each tabbed GUI screen.

9.3.4.2.1 Display Tab. Editable parameters available via this tab control the display presentation of the Storm Track Information (STI), Hail (HI), and Tornado Vortex Signature (TVS) products and overlays.

9.3.4.2.2 Maps Tab. This tab provides the ability to specify the default background map-to-product associations. The designated map associations are used by the system to assign background maps for display when the user profile has not specified another selection.

9.3.4.2.3 Overlays Tab. This tab provides the ability to specify the default overlay-to-product associations. The designated overlay associations are used by the system to assign overlays for display when the user profile has not specified another selection. Additionally, the pixel display priority of the overlays are determined via this GUI.

9.3.4.2.4 Colors Tab. Selections under this tap allow customization of product and map color pallets. Once defined the specific pallet to be used is selectable from the Product Display GUI.

9.3.4.2.5 FTP Dist Tab. This tab is used to view the IP address(es) of the target product distribution server(s) designated for NITF, NEXRAD, and/or PNG format product distribution.

NOTE

The **Save** icon no longer functions, although it appears sensitized.

9.3.4.2.6 NITF/NEXRAD/PNG Dist Tabs. These tabs are used to specify the products to automatically distribute to the appropriate distribution server.

9.3.5 Controls and Indicators.

Operator interaction with the Adaptation Data Editor GUI is via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.3.5.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on every tabbed screen of Adaptation Editor GUI are provided below. An explanation/definition of GUI screen-specific icons are provided in the section dedicated to that specific screen.

Save Changes	Permanently saves the changes. These changes will take effect the next time the specific function is used (e.g., the next time the product is displayed).
Undo All Changes	Undoes all changes made this editing session. (Reverts back to the last saved state.)
Exit The Adaptation Data Editor Application	Closes the `Adaptation Data Editor GUI` window.
Security	When closed, indicates access Level 0. To change access level, click the padlock icon, select the desired access level, and enter the appropriate password. The access level will remain active until it is changed or the Alert Request GUI is closed, at which time the access level is reset to Level 0.

9.3.5.2 Security Access Levels. There are four access levels within the OPUP structure. These levels are used to control access to areas of the system which, if inappropriately or improperly changed, may negatively impact operations.

9.3.5.2.1 No Special Access. Level 0, no special access, is the default level for all OPUP GUI screens and information. This level allows all users unlimited access to view information and data available on the OPUP system. This level does not allow the operator to edit, delete, or create adaptation data or other operationally sensitive parameters.

9.3.5.2.2 Level 1. Level 1 access is designed to allow the shift supervisor to modify adaptation data and operational parameters that affect the operation of the current shift, but do not change or adversely affect the operation of the unit as a whole. Sending a predefined RPS list to selected RPGs is an example that requires Level 1 access.

9.3.5.2.3 Level 2. Level 2 access is the next step up in OPUP operational security. Level 2 access is designed to restrict access to adaptation data and operational parameters that impact or affect the entire unit operations. An example of parameters that require Level 2 access is alert criteria selection. The selection of alert criteria values affect all users of OPUP that rely on or expect notification from the WSR-88D alerting feature.

9.3.5.2.4 Level 3. Level 3 is the highest security level available in OPUP. Level 3 access is considered supervisory level and includes items like non-associated RPG passwords and phone numbers. Adaptation data and parameters that require Level 3 access are rarely changed and may adversely impact OPUP operations if due care is not exercised.

Section 9.4. DISPLAY TAB

9.4.1 Introduction.

Selection of the Display Tab displays a GUI screen that allows the user to define the parameters the OPUP uses to tailor the display of the Storm Track Information (STI), Hail Index (HI), and the Tornado Vortex Signature (TVS) products and overlays. The screen is divided into three sections: SCIT, HDA and TVS.

9.4.2 Controls and Indicators.

Operator interaction with the Display Tab functions are via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.4.2.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

Up Arrow	This selection increments the numerical value in the entry box up by one.
Down Arrow	This selection increments the numerical value in the entry box down by one.

9.4.3 SCIT.

The STI product can display up to 100 cells identified by the SCIT algorithm on a single product. It is also possible to display the actual past positions of the centroid on up to 13 (default 10) previous volume scans. During active weather, the STI product can become extremely cluttered.

To reduce this screen clutter, the OPUP operator can select the number of identified cells (Display Top xx Cells) to be displayed (up to 100), and whether or not to display the Past Locations and/or Forecast Locations.

The following three adaptable parameters may be changed to balance the need for information and the distraction of a cluttered screen.

9.4.3.1 Display Top xx Cells. When displaying the STI product or overlay at any display center or magnification, the OPUP always displays the cells in cell-based VIL rank order starting with the storm cell having the highest cell-based VIL value. The display of cells continues, in decreasing cell-based VIL order, until the number of cells displayed reaches the value specified in this

field, or, no more storm cells exist in the current display window. If the message `“nn cells not visible”` appears at the lower edge of an STI product, it indicates that more cells are located within the current display window than this edit screen field permits for display. In that case, this value may be increased at a cost of cluttering the display with storm cells of lower cell-based VIL values.

> Example: If the OPUP operator selects only 10 cells to be displayed, and the SCIT algorithm has identified 52 cells, there will be a text line in the lower left corner of the STI graphic product stating `“42 CELLS IN WINDOW NOT DISPLAYED”`, and the 42 cells with the lowest Cell-based VIL will not be displayed on the product. If in this example, a magnification of 4X is made on an geographic area that contains 12 cells, the product displays the 10 cells in that area with the highest cell-based VIL and the line `“2 CELLS IN WINDOW NOT DISPLAYED”` is presented at the bottom of the display. If the magnified area had 10 or fewer identified cells, all the cells in that geographic area would be displayed, and no text would be displayed in the lower left corner.

9.4.3.2 Display Past Locations. This option defines the display (or non-display) of storm cell positions for past volume scans as well as the line that connects them. Selecting (clicking) the GUI button for this option enables the display of past storm cell positions. Deselecting the GUI button disables the display of past cell positions.

9.4.3.3 Display Forecast Locations. The Storm Position Forecast portion of the SCIT algorithm predicts the future centroid locations of storm cells based on a history of the cell's movement. This algorithm uses an identified cell’s previous movement over several volume scans and the variance of the forecast movement to output a forecast movement up to 60 minutes in the future. The length of a forecast (0, 15, 30, 45, or 60 minutes) is related to the accuracy of the previous volume scan’s forecast. The larger the error in past volume scan’s forecast, the shorter (in time) the forecast.

This option defines the display (or non-display) of forecast storm cell positions as well as the line that connects them. Selecting (clicking) the GUI button for this option enables the display of forecast storm cell positions. Deselecting the GUI button disables the display of forecast cell positions. The time interval between forecast storm cell positions is defined in RPG adaptation data.

9.4.4 HDA.

The Hail Detection Algorithm (HDA) outputs the following estimates for each cell detected:

- Probability of Hail (POH) - identified as hail of any size, displayed in increments of 10%,
- Probability Of Severe Hail (POSH) - identified as hail that is > 3/4 inch, displayed in increments of 10%, and

- Maximum Expected Hail Size (MEHS) - the estimate of the largest hail size in the cell, computed in increments of 1/4 inch.

NOTE

If the cell is beyond the hail algorithm processing range of 124 nm, then the hail estimates are labeled as UNKNOWN.

The primary product produced by the HDA is the Hail Index (HI) which can be useful in identifying cells that have the potential to produce hail. The Hail Index graphic product presents the algorithm output using four symbols; the POH will be represented with a small open or solid green triangle, and the POSH is represented by a larger green triangle also either open or solid green. Whether the triangle is open or solid green depends on a fill-in threshold set by the OPUP operator for a specific percent-age of occurrence.

The MEHS will be displayed in the center of the POSH symbol rounded to the nearest inch from 1 to 4. If a cell has hail identified that is less than 3/4 inch, then an asterisk (*) will be placed in the center of the POSH symbol.

9.4.4.1 Display Probability of Hail. This option defines the display (or non-display) of the small triangles representing the Probability of Hail. Selecting (clicking) the GUI button for this option enables the display of POH triangle(s). Deselecting the GUI button disables the display of POH triangle(s).

9.4.4.1.1 Minimum Threshold. This threshold value must be met before a probability of hail symbol (smaller green triangle) will be displayed for a given storm cell as part of a HI product or overlay. Deselecting the Display Probability of Hail GUI button will disable any display of the probability of hail symbol on the HI product or overlay. When the hail symbol is disabled, the storm cell ID will still be displayed.

9.4.4.1.2 Fill-in Threshold. This threshold value must be met before a probability of hail symbol (smaller green triangle) will be displayed as a solid, filled-in triangle. A probability of hail symbol for a cell which has a probability of hail less than this threshold is displayed as a small open triangle.

9.4.4.2 Display Probability of Severe Hail. This option defines the display (or non-display) of the large triangles representing the Probability of Severe Hail. Selecting (clicking) the GUI button for this option enables the display of POSH triangle(s). Deselecting the GUI button disables the display of POSH triangle(s).

9.4.4.2.1 Minimum Threshold. This threshold value must be met before a probability of severe hail symbol (larger green triangle) will be displayed for a given storm cell as part of a HI product or overlay. Deselecting the Display Probability of Severe Hail button will disable any display of the probability of severe hail symbol on the HI product or overlay. When the hail symbol is disabled, the storm cell ID will still be displayed.

9.4.4.2.2 Fill-in Threshold. This threshold value must be met before a probability of severe hail symbol (larger green triangle) will be displayed as a solid, filled-in triangle. A probability of severe hail symbol for a cell which has a probability of severe hail less than this threshold is displayed as an open large triangle.

9.4.5 TVS.

The TDA algorithm identifies two types of intense, small-scale Tornadic Vortex Signature (TVS) - type circulations:

- TVS - a 3-D circulation whose base is identified on the .5 degree slice **or** below 600 meters above radar level (ARL).
- ETVS - a 3-D circulation whose base is identified above the .5 degree slice **and** is above 600 meters ARL.

9.4.5.1 Display ETVS. This option allows the suppression of the display of elevated TVS symbols on the TVS product and overlay. Elevated TVS symbols are red, inverted open triangles. Selecting (clicking) the GUI button for this option enables the display of ETVS symbols (inverted, open, red triangles). Deselecting the GUI button disables the display of all ETVS symbols.

Section 9.5. MAPS TAB

9.5.1 Introduction.

Selection of the Maps Tab displays a GUI screen that is used to define the default background map or maps that will automatically be displayed with the display of each individual product.

The default product/maps assignments only apply to a product until an individual users modifies, via the Product Display GUI, the displayed maps for that product. After selection or deletion of displayed background maps for an individual product, the user's profile will govern the maps-to-product associations the next time that product is displayed.

The screen is divided into two sections: the Map Selection Area (designated by the heading Maps to Show with the Selected Product(s)) and the product selection area that is subdivided into (Product) Name, Res, and (Data) Level and Range which, when used together, allow the selection of individual products.

9.5.2 Controls and Indicators.

Operator interaction with the Maps Tab functions are via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.5.2.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

Left Arrow	Highlights the map names that are currently associated to the selected product in the right window.
Right Arrow	Assigns the selected (highlighted) maps to the selected product.

9.5.3 Map Association Assignment.

This GUI supports association of background maps with products so that, prior to user profile modifications, each product is displayed with a basic set of maps. It should be noted that background maps can only be associated with geographic products.

9.5.3.1 Map Selection Area. All available background maps are listed in the left column (Maps to Show with the Selected Product(s)). From this listing individual (single) or multiple maps may be selected for association assignment.

Clicking on a desired map name selects that particular map for association assignment.

Multiple maps may be selected by using the **<Shift>** and/or **<Ctrl>** keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two maps will select (highlight) all the maps that between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired map will select (highlight) the individual map for inclusion in the selected set.

9.5.3.2 Product Selection Area. All WSR-88D products are listed (alphabetically) in this column. From this listing individual (single) or multiple products may be selected for association assignment.

Clicking on a desired product name selects that particular product for association assignment.

Multiple products may be selected by using the **<Shift>** and/or **<Ctrll>** (Ctrl) keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two products will select (highlight) all the products that between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired product will select (highlight) the individual product for inclusion in the selected set.

Section 9.6. OVERLAYS TAB

9.6.1 Introduction.

Selection of the Overlays Tab displays a GUI screen that is used to assign the screen pixel display precedence of each WSR-88D product overlay. The Overlays Tab also allow the user to associate overlays with specific products so that, when a product is displayed, its associated overlays are automatically displayed along with the product.

NOTE

> It should be noted that the more overlays associated with a product, the less visible the product data will appear, and the longer it will take for that product to be completely displayed.

When the pixel precedence assignments are modified and saved the next time the overlays are displayed, either automatically or by selection via the Product Display GUI, the new pixel priority will be used for display.

Once product-overlay associations have been modified and saved, the next time the particular product is displayed, all overlays now associated with that product will be automatically displayed.

9.6.2 Controls and Indicators.

Operator interaction with the Overlays Tab functions are via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.6.2.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

Move Selected Overlay(S) To Top	Moves the selected overlay(s) to the top position in the listing. In essence assigning it the highest pixel display priority.
Move Selected Overlay(S) Up	Moves the selected overlay(s) up one position in the listing. In essence raising its pixel display priority.

Move Selected Overlay(S) To Bottom

Moves the selected overlay(s) to the bottom position in the listing. In essence assigning it the lowest pixel display priority.

Move Selected Overlay(S) Down

Moves the selected overlay(s) down one position in the listing. In essence reducing its pixel display priority.

Left Arrow

Highlights the overlay names that are currently associated to the selected product in the right window.

Right Arrow

Assigns the selected (highlighted) maps to the selected product.

9.6.3 Overlay Association Assignment.

This GUI supports association of meteorological overlays with products so that, prior to user profile modifications, each product is displayed with a basic set of overlays, if desired. It should be noted that meteorological overlays can only be associated with geographic products.

9.6.3.1 Overlay Selection Area. All available meteorological overlays are listed in the left column (Overlays to Display over the Selected Product(s)). The order of this listing reflects the assigned pixel display precedence of the overlays (the higher the overlay in the listing the higher its pixel display precedence).

From this listing individual (single) or multiple meteorological overlays may be selected for association assignment.

Clicking on a desired meteorological overlay name selects that particular map for association assignment.

Multiple maps may be selected by using the **<Shift>** and/or **<Ctrl>** (Control) keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two maps will select (highlight) all the maps that between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired map will select (highlight) the individual map for inclusion in the selected set.

9.6.3.2 Product Selection Area. All WSR-88D products are listed (alphabetically) in this column. From this listing individual (single) or multiple products may be selected for association assignment.

Clicking on a desired product name selects that particular product for association assignment.

Multiple products may be selected by using the **<Shift>** and/or **<Ctrl>** (Control) keys.

- **<Shift>** Key - Depressing and holding down the **<Shift>** key while clicking on two products will select (highlight) all the products that between and including the selected ones.
- **<Ctrl>** (Control) Key - Depressing and holding down the **<Ctrl>** key while clicking on desired product will select (highlight) the individual product for inclusion in the selected set.

Section 9.7. COLORS TAB

9.7.1 Introduction.

Selection of the Colors Tab displays a GUI screen that is used to define product, overlay and background map color pallets. Once defined, the new color pallet is made available for selection on the `Toolbox` window of the Product Display GUI. The specific colors defined within a pallet are assigned to individual products, overlays and maps the next time that item is displayed via the Product Display GUI.

9.7.2 Controls and Indicators.

Operator interaction with the Colors Tab functions are via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.7.2.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

Left Arrow

Populates the window to the left with the contents (parameters) of the selected entity on the right. For example, the color cell contents for the selected product will populate the Edit Colors window.

Right Arrow

Overwrites (replaces) the selected item in the target (right) window with the new definition from the origin (left) window. In other words, the new product color cell definitions defined in the Edit Colors window will replace the product color cells in the Categories window.

Down Arrow

Maps the selected color level onto the color modification window.

Up Arrow

Maps the modified color level onto the color selected color cell.

Color Definition Wheel

The color definition wheel provides an easy interface for defining colors. Simply reposition the cursor within the color wheel to modify the base color, shade, and tint. Using this wheel in conjunction with the Brightness Slider Bar supports the user definition of over 16 million color levels.

Brightness Slider Bar

The Brightness Slider Bar controls the relative brightness of the selected color.

Right Arrow And Plus

Adds the definition contained in the `Categories` window to the contents of the `Color Schemes` window. For example, modified product color cells constitute a new color pallet that can be added to the previously defined color pallets listed in the `Color Scheme` window.

Delete One Line

Deletes the selected (highlighted) line.

Pencil

Provides the ability to name/rename a color pallets.

9.7.3 Colors Tab GUI Interactions.

The screen is divided into three areas: the Edit Colors, Categories (target item selection), and Color Schemes areas.

9.7.3.1 Edit Colors Area. This area allows the modification of the specific display colors of products (and overlays) and background maps. WSR-88D products and maps are displayed using the colors assigned to each data level or map type. Each product consists of either one, 8, or 16 data levels, while each of the 27 background maps are assigned one color each. Each data level (or individual map) color is assigned a color cell #. Therefore, modifying the color for a color cell changes the display color for that data level (map).

Once the color cells are populated in this window they may be assigned to any product with the same number of data levels (color cells). For example, you modify the colors for 16 data level base velocity product, you may then assign these same colors to any other 16 data level product, by simply selecting the new target product and clicking the **Left** (Set Category Colors) arrow.

9.7.3.1.1 (Color Cell) #. Each color cell represents a single data level for the selected product. In the case of background maps, each color cell represents the color of an individual map.

9.7.3.1.2 Color. The OPUP supports the definition, assignment, and display of 16 million colors. The current selected color definition for the color cell is displayed in this column.

9.7.3.1.3 Description. This column is only used for identifying the map associated with the individual color cell.

9.7.3.2 Categories Area. The Categories area provides a listing of color assignment family types, including the number of levels (cells) for assigning colors to that product family, and the current color-cell assignments for the selected pallet.

Colors are assigned to color assignment families rather that individual products. For example, the color assignment family - Reflectivity 16 (data) Levels controls the product display colors for all 16 data level reflectivity and composite reflectivity products, regardless of resolution.

9.7.3.2.1 Levels. This entry provides information on the number of color cells (in the case of products the number of data levels) available for each color assignment family. For the Map family, each map is assigned a single color, corresponding to one color cell.

9.7.3.2.2 Description. This entry is the color assignment family name.

9.7.3.3 Color Schemes Area. This area lists the names of all the previously defined (saved) display color pallets.

9.7.3.3.1 Name. All saved color pallets are listed by name. This is the same name used to select the desired color pallet from the Product Display Tool Box.

9.7.4 Color Pallet Definition Procedures.

The OPUP supports the definition, storage and use of multiple display color schemes (pallets). Within each scheme the display colors for each color assignment family (product type and maps) are defined. The simplest approach is to load a scheme that contains most of the desired color assignments, change only the color assignments for the families that require modification, then save the scheme as a new Color Scheme.

9.7.4.1 Create a New Color Scheme. The following procedures define the steps to create a new color scheme based on a previously defined scheme and how to modify and save a stored scheme.

1. Open the System Status and Control GUI.
2. From the launch bar of the System Status and Control GUI click on the Adaptation button. This action launches the Adaptation (data) GUI as a child window.
3. Select the **Colors** Tab. The Colors edit GUI is brought to the foreground.
4. In the Color Schemes area, click on the name of the color scheme to be used as a basis for the new color scheme definition. This action highlights the selected scheme name.
5. Click the **Left Arrow** (Edit Color Scheme) between the Categories and Color Schemes columns. The color pallet definition of the selected color scheme will display in the `Categories` window.
6. Click on the product family type to assign new color cell definitions. The color cell definitions are displayed in the `Edit Colors` window.
7. Click on a color cell definition. This action highlights the selected color cell.

8. Click the **Down Arrow** (Edit Color) between the color cell assignment area and the color definition wheel. The exact color definition for that cell is displayed at the cursor position on the Color Definition Wheel and in the Brightness Slider Bar display window.
9. Use the Color Definition Wheel in conjunction with the Brightness Slider Bar to define the desired color for the selected color cell.

NOTE

To modify the base color position the cursor over the Color Definition Wheel and depress and hold the mouse button, then move the cursor around within the Color Definition Wheel. To increase/decrease the brightness of the base color use the cursor to slide the Brightness Slider Bar right (increase brightness) or left (decrease brightness).

10. Click the **Up Arrow** (Edit Color) between the Color Definition Wheel and the color cell assignment area. The new color definition for that cell replaces the old cell color definition.
11. Repeat Steps 7 through 10 until all desired color cell assignment for that product family are included in the `Edit Colors` window.
12. Click the **Right Arrow** (Set Category Colors) located between the "Edit Colors" and "Categories" columns.
13. Ensure the new family color definitions now appear in the "Categories" column.
14. Repeat Steps 6 through 13 until all desired color assignment families (products) are included in the `Categories` window.
15. Click on the **Padlock** icon (padlock in right side border). Select Level 2, enter your Level 2 password in the field, then click **OK**.
16. Ensure the **Padlock** icon turns yellow and unlocks.
17. Save this list by clicking the **Plus/Arrow** (Add New Color Scheme) located between the `Categories` window and the `Color Scheme` window.
18. Ensure a new scheme (pallet), identified as New Scheme and tagged with the current date/time is now listed in the `Color Scheme` window.
19. Click on the name New Scheme in the `Color Scheme` window. This action selects the specific scheme and highlights it in inverse video.
20. Click on the **Pencil** (Rename Color Scheme) icon.
21. The Rename drop-down dialog box is displayed. Type a unique name for the new color scheme. This name may be any letter/number combination up to 256 characters long.
22. Click **OK**. Ensure the title of the scheme is renamed from New Scheme to the character string that you entered.
23. Click the **Save Changes** icon. This actions saves the new color scheme definition and makes it available for selection via the Product Display GUI.

24. Click on the **Padlock** icon (padlock in right side border). Select Level 0 and click **OK** to re-lock this GUI interface.

NOTE

Since color scheme definitions are only loaded by the Product Display GUI when it is launched, this new color scheme will not be available on any currently active Product Display GUI. To force the Product Display GUI to see the new color scheme you must exit and relaunch a new instance of the Product Display GUI.

Section 9.8. FTP DIST(RIBUTION) TAB

9.8.1 Introduction.

Selection of the FTP Dist(ribution) Tab displays a GUI screen that is used to only view (not change) the IP address and user logon information for the target product distribution servers. The data entered in the OPUP */ GUI are displayed here. Once valid data are entered, the OPUP will distribute, to the specified target server, those products defined via the Product Distribution GUI (see Section 9.9) for the specific format type.

The OPUP can distribute product data in three display formats: native NEXRAD format (NEXRAD), National Imagery Transfer Format (NITF), and Portable Network Graphics (PNG) format. The NEXRAD format is the unaltered format of products and messages received from the RPG. NITF data are reformatted to modify the data projection and include geolocatable references which enable these data to be simultaneously displayed with other data types. PNG is an extensible file format for the lossless, portable, well-compressed storage of raster images. PNG supports indexed-color, gray scale, true color images, and an optional alpha channel for transparency.

9.8.2 Controls and Indicators.

Operator interaction with the FTP Dist(ribution) Tab functions are via mouse and keyboard. Clicking the mouse activates an edit box or executes the command/function represented by an icon. Positioning and holding the cursor over an icon will activate the on-line Tool Tips definition/help for that icon.

The controls for this Tab are limited to just viewing the entries. The general save, undo, and exit icons available on all other tabs have been deactivated for this tab. These controls have been transferred to the OPUP admintool GUI, where the information can be added, deleted, and viewed.

9.8.3 NITF / NEXRAD / PNG Entries.

The screen is divided into three areas: the NITF area, the NEXRAD area, and PNG. Each area displays the target server IP Address, Username, Authorization Password, Confirm Password, and Path.

9.8.3.1 IP Address. This field displays the target server IP address. The OPUP will automatically transfer product data (in the specified format) to the displayed IP address.

9.8.3.2 Username. This field, along with the password, displays the information used to validate the connection with the target server.

9.8.3.3 Password. This field, along with the username, is used to validate the connection with the target server.

9.8.3.4 Confirm Password. This entry ensures that the password entered in the Password field has not been mistakenly mistyped.

9.8.3.5 Path. This field displays the specified path (target server name and directory structure) to the specific distribution server.

Section 9.9. NITF/NEXRAD/PNG DISTRIBUTION TABS

9.9.1 Introduction.

The three tabs, NITF Dist, NEXRAD Dist, and PGN Dist are all designed the same and perform the same function. Each GUI supports the selection of products for distribution, in the specified format (Nexrad, National Imagery Transfer Format (NITF), and Portable Network Graphics (PNG) format) to the appropriate product server identified under the FTP Dist(ribution) tab.

The NITF, NEXRAD, and PNG Dist(ribution) GUIs provide for the modification and control of the product distribution lists for the specific format products. The product distribution lists define the product sets that are automatically and routinely forwarded from the OPUP server to the target server defined in OPUP adaptation data. Although any operator using OPUP can view the he product distribution lists, access to the edit functions are restricted by access level and password.

9.9.2 Controls and Indicators.

Operator interaction within these Tabs are via mouse selection. Clicking the mouse selects (highlights) the option or executes the command/function represented by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool Tips definition/help for that icon.

9.9.2.1 Enable Product Distribution. On these three GUI screens, the Enable *xxxx* Distribution (where *xxxx* is either NITF, Nexrad, or PNG) check box toggles on/off the distribution of the designated format products. Once enabled, the product(s) defined in the `Products to Distribute` window are automatically distributed until the check box is unchecked (toggled off).

9.9.2.2 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

Right Arrow	Adds the defined product selected in the `Select a Product` window to the contents of the Products to Distribute.
Delete All	Deletes all current entries in the `Products to Distribute` window.
Delete One Line	Deletes the selected (highlighted) line.

Print

Prints the list of products defined for distribution.

9.9.3 NITF Tab.

The OPUP will only allow ten products to be designated of conversion to NITF format for distribution to the NITF product server.

Products are specified based on product type, resolution and data level and elevation (where appropriate). Once a product is selected, every product received, that has the specified parameters, regardless of originating RPG, is converted to NITF format and sent to the designated NITF product server for further dissemination.

9.9.4 NEXRAD Tab.

The editable list allows up to 30 individual products to be specified for distribution in native NEXRAD format.

Products are specified based on product type, resolution and data level and elevation (where appropriate). Once a product is selected, every product received, that has the specified parameters, regardless of originating RPG, is forwarded to the designated NEXRAD product server for further dissemination.

9.9.5 PNG Tab.

The OPUP will only allow ten products to be designated of conversion to PNG format for distribution to the PNG product server.

Products are specified based on product type, resolution and data level and elevation (where appropriate). Once a product is selected, every product received, that has the specified parameters, regardless of originating RPG, is converted to PNG format and sent to the designated PNG product server for further dissemination.

CHAPTER 10
MAP EDIT GUI

Section 10.1. INTRODUCTION

10.1.1 General.

Chapter 10 provides an overview of the OPUP background map editing feature. Additionally, Chapter 10 provides detailed procedures for modifying and managing OPUP background maps.

10.1.2 Chapter Organization.

Chapter 10 is organized into four sections as follows:

- Section 10.1. INTRODUCTION - Provides a brief description of each section found in Chapter 10.
- Section 10.2. OPUP BACKGROUND MAPS - Provides a brief overview of the design and implementation of the background map function.
- Section 10.3. OPUP MAP EDITOR GUI - Describes operator interaction with the Map Editor GUI.
- Section 10.4. MAP EDIT PROCEDURES - Provides step-by-step procedures for editing background maps.

Section 10.2. OPUP BACKGROUND MAPS

10.2.1 Introduction.

To provide map coverage for the various product resolution data coverage areas and to meet the varied OPUP users warning and forecast location reference requirements, the OPUP includes two map versions and three map types

10.2.1.1 Background Map Version. The two map versions are the low detail version and the high detail version.

10.2.1.1.1 Low Detail Map Version. The low detail version contains a limited number of specific locations or only a few large-scale reference locations to constrain the clutter present on the screen (e.g., major cities, interstate highways, etc.). As the zoom level increases the relative areal coverage of the screen decreases allowing more map data to be displayed without cluttering the screen display.

10.2.1.1.2 High Detail Map Version. The high detail maps are only displayed when the displayed product radius is less than 32.4 nm. As the product is zoomed the OPUP automatically displays the high detail map version when the zoom level results in the displayed product radius is less than 32.4 nm.

10.2.1.2 Background Map Type. There are three types of both the low and high detail map versions: the Default (original which cannot be altered), the Custom (site-specific, locally created custom maps), and the Edited type (the latest modified version of an original or custom map).

10.2.1.2.1 Default Maps. The default map set consists of the original maps maintained by configuration management. These maps are not modifiable by the OPUP. These maps are protected so that baseline maps are always available in the event an inadvertent modification is made to an edited map.

10.2.1.2.2 Custom Maps. OPUP provides the creation of up to 5 custom maps. These maps can be created from scratch (starting with a blank screen) or may use any other map as a template. Once created and named, the custom maps are available for display in the Product Display GUI and are treated as any other background map.

10.2.1.2.3 Edited Maps. Background maps may be modified by adding (or deleting) various shapes, line segments, symbols, and/or identifying text. When modifications are made to a background map, they are always saved as the Edited type of the map. The previous modified version of the map is lost and the original version remains unchanged.

10.2.2 Selecting a Map Type for Display.

By default, the Product Display GUI displays the original (Default) maps. The operator may choose to use the Edited Maps by selecting the Edited Maps checkbox located on the Product Display GUI ToolBox. Once selected, the Edited Maps will not be displayed until the current

instance of the Product Display GUI is closed and the user launches a new instance. This process also updates the user's profile so that each subsequent instance of the Product Display GUI launched by that user will automatically invoke the Edited Map selection.

Section 10.3. OPUP MAP EDITOR GUI

10.3.1 Introduction.

The Map Editor GUI provides for the modification of predefined background maps as well as the creation of up to five locally built custom maps. The following paragraphs provide information and definitions pertaining the functionality exercised via the Map Editor GUI.

10.3.2 Launching the Map Editor GUI.

To activate the Map Editor GUI, from the OPUP workstation click on the **Map Edit** button on the Launch Bar Status and Control GUI (see Section 6.3). This action loads and starts a new, independent, instance of the Map Edit GUI software for this workstation. The access to view the information provided by this GUI is not restricted; however, saving modification and creating new maps are restricted to second level and higher access.

10.3.3 Overview of the Map Editor GUI.

The Map Edit GUI (Figure 10-1) is divided into three major sections. The area on the left side of the GUI contains the map edit tools, the center portion of the GUI hosts the Map Editor Work Area, and left side the GUI is used to select the particular map to edit and provides for the display of additional maps to be used as reference while in the editing process. Each icon, button, and selection presented on the Edit Map GUI is described in the following paragraphs.

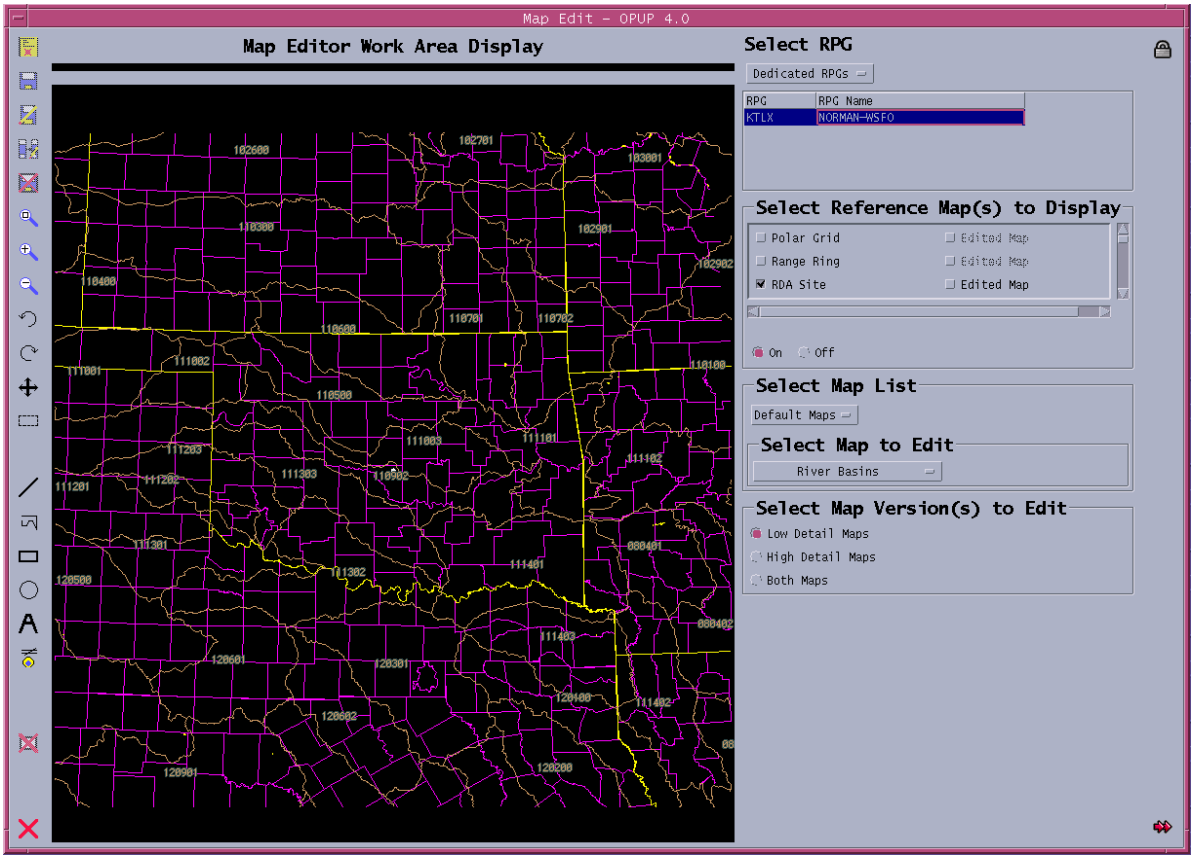


Figure 10-1. Map Edit GUI

10.3.3.1 Map Edit Tools. The map edit tools are designated by icons. Each tool has a Tool-Tip that provides information regarding the action executed by its selection. See paragraph 10.3.4.1 for an explanation of the function of each tool.

10.3.3.2 Map Editor Work Area. The Map Editor Work Area is the section of the GUI where map modifications are made. This are also provide visual conformation of the location, size and shape of each edit feature and text. See Section 10.4 for details concerning interaction with the Map Editor Work Area.

10.3.3.3 Select RPG.. The Select RPG drop-down window lists all available WSR-88Ds, according to the selected RPG-type selection, by their 4 letter station identifier. The contents of this window are controlled by the **RPG Selection** button. Options under this button list the radars alphabetically in three categories: Dedicated RPGs, AOR RPGs (non-associated RPGs in and immediately surrounding your area of responsibility), and All Dial-up RPGs (all other non-associated RPGs).

Once the window is populated according to the selected RPG-type selection, the order of listed

RPGs may be changed by selecting the desired sort order (viz., RPG, RPG Name) in the column header. The listed order has no effect on the list contents, it only affects the displayed order.

This drop-down allows the operator to select the RPG (radar) of interest. Once a radar has been identified, all interactions with the Map Editor Work Area are focused on the selected radar.

The Radars window includes the following fields.

10.3.3.3.1 RPG. A color-coded radar icon with the four letter radar site identification is listed for every WSR-88D. The color of the radar icon reflects the current state of the radar as derived from the General Status Message last received from that radar. See paragraph 3.4.3.4.1 for the status definition of each color.

10.3.3.3.2 RPG Name. This field contains the common name (location) of the particular radar.

10.3.3.4 Select Reference Map(s) to Display. This scroll box allow the selection of reference maps for display along with the map being edited. Selecting a particular map name displays that map in the Map Editor Work Area and enables the selection of it's associated Edited Map version. Selection of the Edited Map check box replaces the original version of the map on the Map Editor Work Area with the edited version.

NOTE

> The Edited Map may contain any information or combination of lines, text, and symbols and may not reflect any other information contained in the original (Default version) Map.

Any map selected for display via this scroll box may be toggled On/Off by selecting the respective radio button. When toggled Off, only the map currently selected for modification (editing) will be displayed in the Map Editor Work Area.

10.3.3.5 Select Map List. This drop-down window lists the three available map types (Default, Edited, and Custom). The base map display for editing is selected from this list.

NOTE

> The Default map type is a valid selection for use as the map on which to base modifications. However, remember that when the modifications are saved they are save as the Edited Map type. Permanent modification to the Default Map are not possible via the Map Editor.

10.3.3.6 Select Map to Edit. The Select Overlay to Edit drop-down menu list all map names of the map type specified in the Select Map File to View drop-down. Selection of a particular map name from this list displays that map in the Map Editor Work Area for editing (modification).

10.3.3.7 Select Map Version(s) to Edit. This selection specifies whether the new data will be displayed only on the low detail map, only on the high map, or on both maps.

10.3.4 Controls And Indicators.

Operator interaction with the Map Editor selection is via the mouse and keyboard selections. Depressing the mouse button selects (highlights) the option or executes the command/function representation by the icon. Positioning and holding the cursor over a control function icon will activate the on-line Tool-Tips definition/help for that icon.

10.3.4.1 Icons. To enhance the usability of the interface, graphic icons are used to execute various commands/functions. Icons that are not valid selections due to the current active process or the access level of the user are de-sensitized (greyed-out in appearance). A brief explanation/definition of the icons presented on this GUI are provided below:

New Custom Map	Opens a Pop-up Box which allows the user to specify a name for the new background map to be created.
Save Map	Allows the user to save changes as an edited background map.
Save As Custom Map	Allows the user to save initial map with the new changes as a Custom Map. The options are to replace a current Custom Map or to save it as a new Custom Map by specifying a new (different) map name (Save As).
Rename Custom Map	Allows the user to rename a specific edited background map.
Delete Custom Map	Allows the user to delete a previously defined Custom Map.
Zoom All	Re-displays Map Edit area from any position to its fullest extent.
Zoom In	Zooms in on the point of interest one step.
Zoom Out	Zooms the point of interest out one step.

Undo

De-selects or undoes that last function initiated by the user.

Redo

Re-selects or redoes the last undone function.

Move

When selected, allows the user to specify the to the center point of interest by clicking.

Select Object(s)

The Select Object(s) tool allows the user to draw a rectangle over the item(s) to highlight for deletion. Use this tool in conjunction with the Delete Objects tool to delete unwanted entries.

Draw Line

The Draw Line function that places a line between two points selected by consecutive left clicks (e.g., lines drawn between click 1 and 2, between click 3 and 4, etc., the line however, will not be drawn between click 2 and 3). To cancel the selected point, click the **right** mouse button. The Draw Line function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Rectangle, etc.).

Draw Polyline

The Draw Polyline function draws a line connecting all points selected by mouse clicks (e.g, a line is drawn between click 1 and 2, between click 2 and 3, between click 3 and 4, etc., resulting in a multi-segment, continuous line. To end a polyline, click the **right** mouse button. The Draw Polyline function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Rectangle, etc.).

Draw Rectangle

The Draw Rectangle function draws user-definable rectangles. To define a rectangle, click to select the first corner, drag the cursor to size the rectangle, then click a second time to define the second (diagonal) corner. To cancel a selected point, click the **right** mouse button. The Draw Rectangle function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Circle, etc.).

Draw Circle

The Draw Circle function draws user-definable circles. To define a circle, click to select the center point, drag the cursor to size the circle (radius), then click a second time to define the circle. To cancel a selected point, click the **right** mouse button. The Draw Circle function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Rectangle, etc.).

Draw Text

The Draw Text function opens a text entry box, where the user is prompted to enter the desired text to be dropped onto the map. Once the **OK** button is selected, the text is shadowed to the cursor. To drop the text, simply place the cursor over the desired location and click. The Draw Text function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Rectangle, etc.)

Draw Symbol

The Draw Symbol function opens the Symbols (selection) Menu, from which the operator may select a desired predefine symbol. Click on a symbol to select it. The selected symbol is now shadowed to the cursor. To drop the symbol, click on the desired location. The Draw Symbol function remains active until another edit tool is selected (e.g., Undo, Select Objects, Draw Rectangle, etc.)

Delete Selected Object(s)

Deletes highlighted (Selected) objects from the background map.

Cancel

Cancels all changes made to the background map during this edit session (since the last time it was saved).

Exit Map Editor Application

Closes the Map Editor Application GUI.

Security Level

Opens up a pop-up window that allows the user to change security access levels. When closed, indicates access Level 0. To change access level, click the **Padlock** icon, select the desired access level, and enter the appropriate password. The access level will remain active until it is changed or the Alert Request GUI is closed, at which time the access level is reset to Level 0.

10.3.4.2 Access Levels. There are four access levels within the OPUP structure to restrict access to areas of the system that may negatively impact operations.

10.3.4.2.1 No Special Access. Level 0, no special access, is the default level for all OPUP user screens and information. This level allows all users unlimited access to view information and data available on the OPUP system. This level does not allow the operator to edit, delete, or create map data or alter other operationally sensitive parameters.

10.3.4.2.2 Level 1. Level 1 access is designed to allow the shift supervisor modification access to adaptation data and operational parameters that affect the operation of the current shift, but do not change or adversely affect the operation of the unit as a whole.

10.3.4.2.3 Level 2. Level 2 access is the next step up in OPUP operational security. Level 2 access is designed to restrict access to adaptation data and operational parameters that impact or affect the entire unit operations. For example the save, rename, and create map editing functions of this GUI require Level 2 access

10.3.4.2.4 Level 3. Level 3 is the highest security level available in OPUP. Level 3 access is considered supervisory level and includes items like non-associated RPG passwords and phone numbers. Adaptation data and parameters that require Level 3 access are rarely changed and may adversely impact OPUP operations if due care is not exercised.

Section 10.4. MAP EDIT PROCEDURES

10.4.1 Introduction.

The Map Edit GUI supports the editing of the default maps as well as previously edited maps and provides the ability to create and edit custom local maps. The following procedures provide the basic steps for editing and creating maps. The background map editing functions can be exercised at anytime, however, security level two (2) must be granted before any changes can be saved or a new map can be created.

10.4.2 Map Selection And Preparation.

Prerequisite: It is assumed that the operator has the Status and Control GUI displayed. The following procedure will guide the user in initiating simple edits for a selected background map.

1. Open the Map Edit GUI window by clicking on the **Map Edit** button located on the OPUP Status and Control Launch bar. The Map Edit GUI is displayed.
2. Click on the desired RPG sort option (either Dedicated RPGs, AOR RPGs, or All Dialup RPGs) located in the Select RPG area. This action populates the RPG selection window with the results of the sort.
3. Click on the desired RPG name. This identifies the maps from that RPG for editing.
4. Optional Step: If you want reference maps displayed to aid in locating and placement of your edits, click on the desired map name in the Select Reference Map(s) to Display window. You may select as many reference maps as you wish. There is no restriction to the number or type (original or previously edited) of displayed reference maps.
5. To control (modify) the contents of the Select Map to Edit drop-down window, click over the Sort by Map Type drop-down and select the desired sort option. The contents of the Select Map to Edit drop-down window reflects the selected option.
6. Select the desired map to edit by clicking on the map name in the `Select Map to Edit` drop-down window.
7. Select whether you want the edits to appear on the only the Low Detail map version, only the High Detail version, or on Both Map versions via the radio buttons in the Select Map Version(s) to Edit area.
8. Perform all desired edits using the various editing tools. For information on the function of each editing tool see paragraph 10.3.4.
9. Click on the **Padlock** icon (padlock in right side border). Select Level 2 and click on the password entry window. Enter your Level 2 password in the field, then click **OK**.
10. Ensure the **padlock** icon turns yellow and unlocks and the icons interfacing with the Save functions all become active (hot).
11. Save the edits using either the Save or Save As function.

12. To relock the Map Edit GUI, click on the **Padlock** icon (padlock in right side border). Select **no special access**, then click **OK**. This disables the all Save functions, effectively relocking the window.
13. To close the Map Edit GUI window, click on the **Exit Map Editor Application** button.

10.4.3 Creating a Local Background Map.

Prerequisite: It is assumed that the operator has the Status and Control GUI displayed. The following procedure will guide the user in initiating the creation of a local background map.

1. Open the Map Edit GUI window by clicking on the **Map Edit** button located on the OPUP Status and Control Launch bar. The Map Edit GUI is displayed.
2. Click on the desired RPG sort option (either Dedicated RPGs, AOR RPGs, or All Dialup RPGs). This action populates the RPG selection window with the results of the sort.
3. Click on the desired RPG name. This identifies the maps from that RPG for editing.
4. Click on the **Padlock** icon (padlock in right side border). Select Level 2, click on the password entry window. Enter your Level 2 password in the field, then click **OK**.
5. Ensure the padlock icon turn yellows and “unlocks” and the **New Edited Map** icon becomes active (hot).
6. Click on the **New Edited Map** icon. The New dialog text entry box is displayed.
7. Enter a name for the new Custom Map in the text entry field (see paragraph 10.3.3).
8. Optional Step: If you want reference maps displayed to aid in locating and placement of your edits, click on the desired map name in the Select Reference Map(s)to Display window. You may select as many reference maps as you wish. There is no restriction to the number or type (original or previously edited) of displayed reference maps.
9. Select whether you want the edits to appear on the only the Low Detail map version, only the High Detail version, or on Both Map versions via the radio buttons in the “Select Map Version(s) to Edit” area.
10. Perform all desired edits using the various editing tools. For information on the function of each editing tool, see paragraph 10.3.4.
11. Save the edits using either the Save function.
12. To relock the Map Edit GUI, click on the **Padlock** icon (padlock in right side border). Select **no special access**, then click **OK**. This disables the all Save functions, effectively relocking the window.
13. To close the Map Edit GUI window, click on the **Exit Map Editor Application** button.

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GLOSSARY OF TERMS

Acronym or Non-Standard Term . . . . . Definition

A
AFWA . . . . . Air Force Weather Agency
APC . . . . . American Power Conversion
APR . . . . . Anomalous Propagation Removed
AWIPS . . . . . Advanced Weather Interactive Processing System
AZ/RAN . . . . . Azimuth Range

B
BNCC . . . . . Base Network Control Center

C
CFC . . . . . Clutter Filter Control
CM . . . . . Combined Moment
CR . . . . . Composite Reflectivity
CRC . . . . . Composite Reflectivity Contour
CS . . . . . Combined Shear
CSC . . . . . Combined Shear Contour

D
dBZM . . . . . Maximum reflectivity value
dmcu . . . . . Dial Message Control Unit
DOC . . . . . Department of Commerce
DoD . . . . . Department of Defense
DOT . . . . . Department of Transportation

E
ET . . . . . Echo Tops
ETC . . . . . Echo Tops Contour

F
FTM . . . . . Free Text Message

G
GUI . . . . . Graphical User Interfaces

H
HI . . . . . Hail Index
HSR . . . . . Hybrid Scan Reflectivity

L
LRA . . . . . Layer Composite Reflectivity Average

GLOSSARY OF TERMS

Acronym or Non-Standard Term . . . . . Definition

LRM . . . . . Layer Composite Reflectivity Maximum

M
MLOS . . . . . Microwave Line-Of-Site
MRU . . . . . Mesocyclone Rapid Update

N
NCDC . . . . . National Climatic Data Center

O
OHP . . . . . One Hour Precipitation Accumulation
OPUP . . . . . Open Principal User Processor
OS . . . . . Operating System
OTR . . . . . One Time Request
OWS . . . . . Operational Weather Squadron

P
pdgui . . . . . Product Display Graphical User Interface
POH . . . . . Probability of Hail
POSH . . . . . Probability of Severe Hail
PR . . . . . Product Request

R
RCS . . . . . Reflectivity Cross Section
RDA . . . . . Radar Data Acquisition
RPG . . . . . Radar Product Generator
RPG/HCI . . . . . Radar Product Generator/Human Computer Interface
RPS . . . . . Routine Product Set

S
SCS . . . . . Spectrum Width Cross Section
SRM . . . . . Storm Relative Mean Radial Velocity Map
SRR . . . . . Storm Relative Mean Radial Velocity Region
SS . . . . . Storm Structure
STI . . . . . Storm Tracking Information
STP . . . . . Storm Total Precipitation Accumulation
SW . . . . . Base Spectrum Width
SWP . . . . . Severe Weather Probability
SWR . . . . . Severe Weather Analysis Reflectivity
SWS . . . . . Severe Weather Analysis Radial Shear

GLOSSARY OF TERMS

Acronym or Non-Standard Term . . . . . Definition

SWV . . . . . Severe Weather Analysis Velocity
SWW . . . . . Severe Weather Analysis Spectrum Width

T
T1 . . . . . High Speed Commercial Or Private Link
TCP/IP . . . . . Transmission Control Protocol/Internet Protocol
THP . . . . . Three Hour Precipitation Accumulation
TRU . . . . . Tornado Rapid Update
TVS . . . . . Tornado Vortex Signature

U
UAM . . . . . User Alert Message
UNIX . . . . . Workstation Operating System
USP . . . . . User Selectable Precipitation
UTC . . . . . Universal Coordinated Time

V
VAD . . . . . Velocity Azimuth Display
VCS . . . . . Velocity Cross Section
VIL . . . . . Vertically Integrated Liquid
VWP

W
WER . . . . . Weak Echo Region
WRQ . . . . . X-windows Emulation Software Package