

RRS SYSTEM ADMINISTRATION
for the
RADIOSONDE REPLACEMENT SYSTEM (RRS)

Major Components:

RRS Workstation (RWS)
Telemetry Receiver System (TRS)
Signal Processing System (SPS)
Radiosonde Surface Observing Instrumentation System (RSOIS)

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FOREWORD

RRS MAINTENANCE PHILOSOPHY

The RRS maintenance philosophy is for the field to replace Line Replacement Units (LRU) with equipment repaired by the National Reconditioning Center (NRC). Repair parts will be provided through the normal National Logistics Support Center (NLSC) requisition process.

PURPOSE OF THE MANUAL

This manual provides the procedures required by Systems Administrators to install and maintain RRS software and firmware for the:

- RRS Operating System (OS) (i.e. Ghost) Software;
- RWS (Build) Application Program Software;
- Offline Maintenance Suite (OMS) Software;
- RWS LDAD Installation Instructions;
- Telemetry Receiver System (TRS) Firmware;
- Signal Processing System (SPS) Software; and
- RSOIS Software.

To maintain the performance of the Radiosonde Replacement System (RRS) Software and Firmware, all RRS **System Administrators** will be required to perform the following duties:

- Install, upgrade, and maintain operating systems including network operating systems such as PC-NFS.
- Support Users.
- Apply patches and upgrades to operating systems and utilities as soon as they become available.
- Install, troubleshoot, and upgrade applications.
- Maintain data integrity by backing up file systems.
- Fix hardware or coordinate maintenance.
- Purchase, install and maintain local hardware.
- Install and maintain peripherals (printers, CD-RW drives, etc.)
- Administer file systems, including networked file systems.
- Monitor disk usage and perform such tasks as:
 - Removing unwanted files
 - Backing up file systems
 - Implementing system failure/recovery procedures
 - Implementing user data backups and recovery
 - Reconfiguring swap space

RRS MAJOR COMPONENTS

- Telemetry Receiver System (TRS) is an integrated electromechanical device using microprocessors and software to the greatest extent possible to manage the system's operations. The TRS works on the principle of an automatic radiotheodolite.
- RRS Workstation (RWS) is off-the-shelf computer hardware, a Windows operating system tailored by the NWS, and NWS developed software applications that include a user interface based on the "windows" model. The NWS software processes radiosonde data, TRS data, and provides flight management and other data catalogue and storage capabilities via a Structured Query Language (SQL) relational database.
- Global Positioning System (GPS) Radiosonde and Signal Processing System (SPS) are complementary units, designed to work together in an upper-air reporting system. Radiosondes are lofted into the upper atmosphere by balloon flight equipment, while the SPS is a part of the ground station equipment. A radome GPS system provides a baseline for differentially calculated GPS position and velocity data.
- The Radiosonde Surface Observing Instrumentation System (RSOIS) provides surface observation data in preparation for and during the flight.

RRS DOCUMENTS

The following documents provide operating and maintenance information for the RRS System:

RRS Equipment	NWS Publication
Telemetry Receiver System (TRS)	NWS EHB 9-710: Operations and Maintenance for the Telemetry Receiver System (TRS)
MkIIA Radiosonde and Signal Processing System (SPS)	NWS EHB 9-715: Operations and Maintenance for the Sippican MkIIA Radiosonde and Signal Processing System (SPS)
RRS Workstation (RWS)	NWS EHB 9-720: Operations and Maintenance for the RWS.
Fault Isolation & Troubleshooting	NWS EHB 9-725: Fault Isolation and Troubleshooting Manual
System Administration (SA)	NWS EHB 9-730: RRS System Administration, and AWIPS RWS-LDAD System Administration Note 15
Radiosonde Surface Observing Instrumentation System (RSOIS)	NWS EHB 9-201: Operations and Maintenance for the Radiosonde Surface Observing Instrumentation System (RSOIS) w/Appendices A-M.

ORGANIZATION OF THE MANUAL

This RRS System Administration manual consists of a cover page, table of contents, forward, and the following chapters:

- Forward - Introduction to the RRS, its major components, and the use and organization of the manual.
- Chapter 1 - System Administration tasks for installing RWS software.
- Chapter 2 - System Administration tasks for installing TRS firmware.
- Chapter 3 - System Administration tasks for installing SPS software.
- Chapter 4 - System Administration tasks for installing RSOIS software.

LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation	Definition
AC	Alternating Current
AC	Air Conditioner
AFC	Automatic Frequency Control
ALC	Automatic Level Control
AM	Amplitude Modulation
ANT	Antenna
AWIPS	Advanced Weather Interactive Processing System
Az	Azimuth
BILS	Balloon Inflation and Launch System
BIOS	Basic Input/Output System
BIT	Built-In-Test
BTU	British Thermal Unit
C	Centigrade
CDU	Control Display Unit
COTS	Commercial-Off-The-Shelf
CPU	Central Processing Unit
dB	Decibel
dBm	Decibels relative to 1 milliwatt
dBW/M2	Decibels relative to 1 Watt per Meter Squared
DC	Direct Current
DCE	Digital Communication Equipment
Deg	Degree
EEPROM	Electrically Resalable Programmable Read Only Memory
EI	Elevation
EMI	Electromagnetic Interference
Err	Error
F	Frequency
F/d	Focal length / diameter
FM	Frequency Modulation
Freq	Frequency
GFE	Government Furnished Equipment
GPS	Global Positioning System
hPa	Hecto Pascal
IF	Intermediate Frequency
INCO	Installation and Checkout
Lat	Latitude
LCD	Liquid Crystal Display
LNA	Low Noise Amplifier
Long	Longitude
LRU	Line Replaceable Unit
M	Meter
Max	Maximum
MCU	Motion Control Unit
MHz	Megahertz
min	Minimum
Mm	Millimeter
mV	Millivolts

Abbreviation	Definition
NAGS	Narrow Angle Gathering Sensor
NCDC	National Climatic Data Center
NE	North East
NLSC	National Logistics Support Center
NRC	National Reconditioning Center
NW	North West
OMS	Offline Maintenance Suite
OS	Operating System for RRS Workstation
PC-board or PCB	Printed Circuit Board
PDB	Precision Digital Barometer
Posn	Position
POST	Power On Self Test
Ppm	Parts per million
PSA	Power Supply Assembly
PTU	Pressure, Temperature and Humidity
PWM	Pulse Width Modulated
RAM	Random Access Memory
RDF	Radio Direction Finding
Rel	Relative
RF	Radio Frequency
RH	Relative Humidity
ROM	Read Only Memory
RRS	Radiosonde Replacement System
RSOIS	Radiosonde Surface Observing Instrumentation System
RWS	RRS Workstation
Rx	Receiver
SAA	Scanning Antenna Assembly
SCA	System Communication Assembly
SCB	System Control Bus
SE	South East
Sig	Signal
SPS	Signal Processing System
SQL	Structured Query Language
SW	South West
TDM	Time Division Multiplexing
TRS	Telemetry Receiver System
U	Unit
UAIB	Upper Air Inflation Building
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UTC	Universal Coordinated Time
V	Volt
VAC	Volts Alternating Current
VDC	Volts Direct Current
VOM	Volt Ohm Milliammeter
WAGS	Wide Angle Gathering Sensor

USE OF TERMS - RWS DEFINITIONS

To avoid confusion, the following terms will be used throughout this document:

- RWS. Abbreviation for RRS WorkStation. A complete RRS Workstation includes: Gateway E6300 Computer, keyboard, mouse, monitor, printer, external HD, cables, and software.
- RRS Workstation. An alternate term for RWS.
- RWS PC or RWS Computer. Defined as the RWS processor tower alone.
- RWS (Ghost) OS. Defined as the NWS modified Windows XP Operating System.
- RWS Operational Build Applications Software. Defined as the applications software developed by NWS to process RRS data.
- RWS OMS. Defined as the applications software developed by NWS to perform Offline Bit testing of RWS hardware and software.
- RWS BIOS. Software/firmware for the RWS PC.

CHAPTER 1 - RRS WORKSTATION (RWS) SYSTEM ADMINISTRATION

1.1 Backup RRS Data Prior to Re-Installing RWS Software

To avoid loss of site data, Section 1.1 provides instructions for backing-up RRS flight, station, and user data prior to installing (ghosting) the RWS Operating System (OS). This section applies each time the RWS OS is ghosted.

Each time the OS is loaded on the RRS Workstation, the hard drive is completely erased. All software programs must be reloaded, including: OS, RWS Build Application, and OMS. Also, all Site Data must be backed up and restored, including: Flight, User, Station, and LDAD data.

1.1.1 Record the Last Ascension Number

During the RWS reinstallation process, the next available flight ascension number must be entered. Determine the next ascension number based upon the last one used. The ascension number should be recorded on the B-29 form:

The next available ascension number is: _____.

NOTE: The individual installing the RWS Software **MUST** be logged onto the current RWS Workstation (for ghosting) as the RWS Site Administrator.

1.1.2 Backup RWS Flight Database to External Hard Drive

The screens displayed in RWS Application Software Build 1.2 and those displayed in Build 2.0 (or future builds) may be different in format, but the purpose and content are the same - to backup Flight Data. Use whichever screen your system displays to perform the function.

1. Double-click the RWS.NET (see Figure 1-31) shortcut on the desktop to start the RWS application. The NOAA Warning appears (It may take up to one minute to open)
2. Click **OK**. The *Main RWS Menu* displays (see Figure 1-18).
3. Select the **RRS Offline Menu** icon (see Figure 1-33).
4. Select **Utilities** from the **Tools** menu.
5. For RWS Build 1.2 RWS Software, select **Database Backup and Restore Utilities**.
 - a. Select **Backup Utility**.
 - b. Click **Select Files** from the **RRS Backup - 1.2 Database Backup and Restore Utility** screen (Figure 1-1).
 - c. While pressing **Shift**, select the first (Flight) file listed, and the last file (all files should be selected). Click **OK**.
 - d. Click **Select Folder** and browse to E:\RWSBackup. Click **OK**.
6. For RWS Build 2.0 Software, select **Database Backup and Restore Utilities**, and **Backup Utility** (Figure 1-2).
 - a. Click the **Backup Utility** button. The Database Files for *Backup* window appears.
 - b. Click **Backup**. The selected (Flight) files are backed up to **E:\RWSBackup**. A Backup successful message will appear. Click **OK**.
 - c. Select **Flight** menu and **Close**.

d. Select **Flight** menu and **Exit**.

7. This Backup data will be used to enter local station data as defined in section 1.6.4.

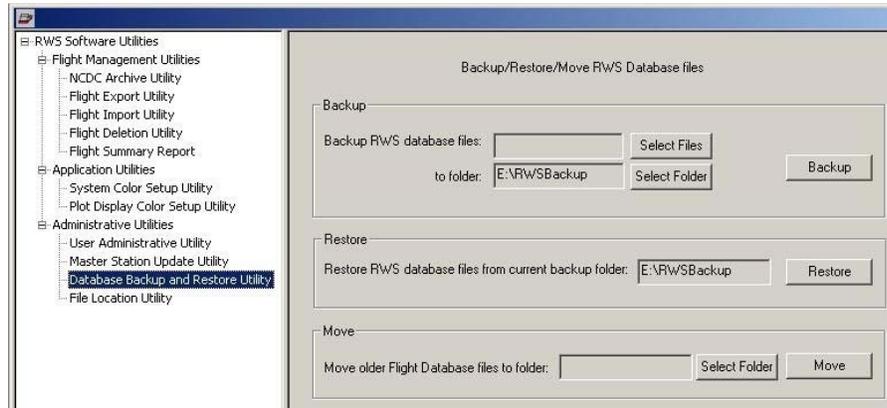


Figure 1-1: RRS Backup - Build 1.2

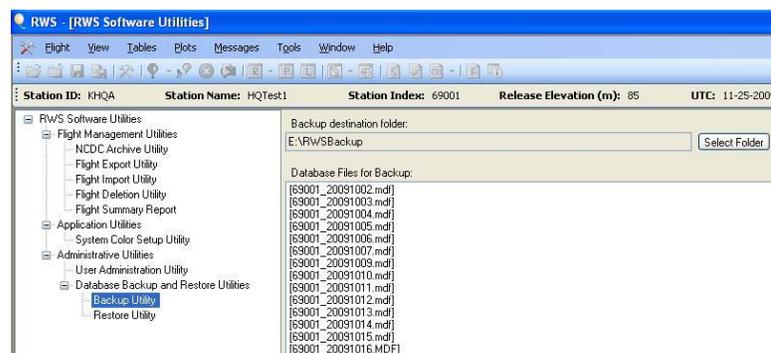


Figure 1-2: RRS Backup - Build 2.0

1.1.3 Alternate Flight Data Backup Procedure

If the external hard drive is not working or fails to backup the RWS database (section 1.1.2), create a Flight Backup using one or more CDs, as follows:

1. Create a new Windows folder on the C drive called *RWS CD Backup*.
2. Double-click **RWS shortcut** on the desktop to start the RWS application. The *NOAA Warning* dialog box appears.
3. Click **OK**. The main menu appears.
4. Select the **Enter offline mode** icon.
5. Click the Tools menu item and select **Utilities**. The utilities screen opens.
6. On the left side of the screen, click **Flight Export Utility** (under Flight Management Utilities).
7. Select all flights for the past 30 days and click **Export** at the bottom of the screen. (Press the Control key while clicking in the first column to select multiple flights at one time. To select a range of flights, press the Shift key and select first and last flights of the range.)
8. In the *Export Flight* window, choose the **RWS CD Backup** folder on the C:\ drive.
9. Click **OK** to export flights and then continue to click **OK** until all the flights have been exported.

10. Select **Close** under the *Flight* menu. The *Utilities* menu closes.
11. Select **Exit** under the *Flight* menu. The RWS application closes.
12. Copy the RWS CD Backup folder from the C:\ drive to one or more CDs and label them **RWS CD Backup-1, -2, etc.** This flight data will be needed as input in section 1.6.6.

1.1.4 Backup RWS User Data

During the RWS operating system installation (ghosting) process, all users on the RWS computer will be erased. Therefore, all user account names must be recorded so they can be recreated.

1. Double-click **RWS shortcut** on the desktop to start the RWS application. The NOAA Warning appears.
2. Click **OK**. The main menu displays.
3. Select the **Enter offline mode** icon.
4. Click the **Tools** menu item and select **Utilities**. The *Utilities* screen opens.
5. On the left side of the screen, click **User Administrative Utility** (under **Administrative Utilities**) - this may take up to 30 seconds to appear.
6. Press the **Alt + PrintScreen** key on the keyboard to print a copy of the user name, full name, comment, and access level privileges for RWS user. Use this information in Section 1.6.9, "Enter New Users for RWS."
7. Select **Close** under the **Flight** menu. The *Utilities* menu closes.
8. Select **Exit** under the **Flight** menu.

1.1.5 Print and Save Site-Specific Data

1. Log on as **RWS Site Administrator**.
2. Click on the *RRS Offline Menu Icon*.
3. Select the **TRS Maintenance** option.
4. Click the **Setup** menu and select the **Station Data** option.
5. Press the **Alt + PrintScreen** key on the keyboard to print a copy of the OMS Station Data.
6. Select **Exit** from the *File* menu.
7. **Close** the *RRS Offline Menu*.
8. Start the RWS and enter **Offline Mode**.
9. Click **View** and **Station Data Display**. Press the **Alt + PrintScreen** key or the **Print** key to print a copy of the Station Data Information.
10. Right-click on the frame of the **Station Data Display** window and select; **Save Data in a File**.
11. The message file will be automatically saved to C:\RWS\RWS\Data Files\STATION_DATA.TXT. Click **OK**.
12. Click **LDAD Info** and, if necessary adjust the column size so the IP addresses are visible.
13. Press the **Alt + PrintScreen** key to print a copy of the LDAD Information.

NOTE: Ensure the passwords for the LAN and the dial-up LDAD connections are recorded prior to ghosting the RWS.

14. Click **OK** in *LDAD Info*.
15. Click **OK** on *Station Data*. The LDAD Info and the Station Data will be used to Install Station Residence Data (sections 1.6.4, 1.6.5, and 1.6.8).
16. Exit RWS.

1.1.6 Save Station Data to External Hard Drive

Use Windows Explorer to copy the C:\RWS\RWS\Data Files\STATION_DATA.TXT file to the USB E:\ drive (external hard drive). If the USB drive is not available, copy the file to a CD. This file is a backup copy and should be used to enter the data for sections 1.6.4, 1.6.5, and 1.6.8.

1.1.7 Save LDAD Data to External Hard Drive

Use Windows Explorer to copy the folder C:\LDAD to the USB E:\ drive (external hard drive). If the USB drive is not available, copy the file to a CD (the C:\LDAD folder contains the PuTTY keys).

1.1.8 Save NCDC Data to External Hard Drive

Use Windows Explorer to copy the C:\RWS\RWS\NCDC folder to USB E:\ drive (external hard drive): this folder contains archived flights. Press the **Alt + PrintScreen** key or the **Print** key to print a copy of the NCDC Data. The NCDC Data is automatically saved under Build 2 (i.e. no manual copying required).

1.1.9 Backup Current Computer IP Address

During the RWS ghosting process, the computer name and network information on the RWS computer will be erased. Therefore, the computer name and network information must be recorded so they can be recreated.

1. Click **Start**.
2. Select **Control Panel**.
3. Look at the left side of the *Control Panel* screen to ensure the system is in *Classic View*, (Figure 1-3), and not in *Category View*.

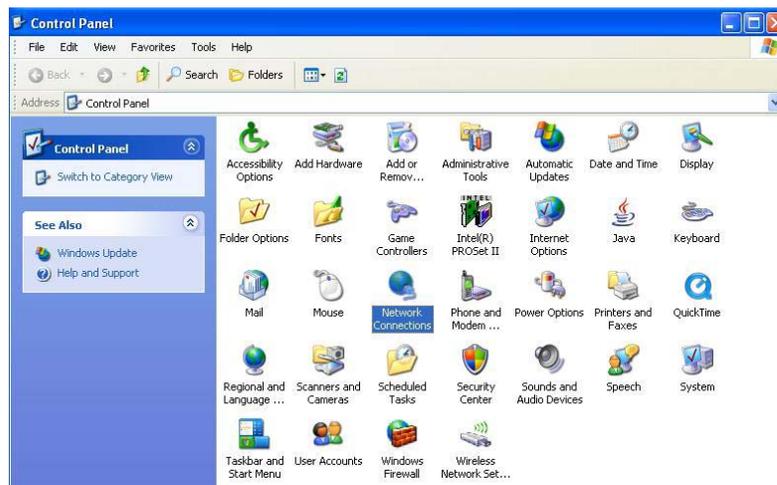


Figure 1-3: Classic View for IP Address

4. Double click the **Network Connections** icon.
5. Right-click **Local Area Connection**.
6. Select **Properties**. The *Local Area Connection Properties* window will appear.
7. Select **Internet Protocol (TCP/IP)** from the list, and click **Properties**. The *Internet Protocol (TCP/IP) Properties* window will appear.
8. Press the **Alt + PrintScreen** key to print the IP Address, Subnet Mask, Default Gateway, Preferred and Alternate DNS Server information.
 - a. IP Address: _____ .
 - b. Subnet Mask: _____ .
 - c. Default Gateway: _____ .
 - d. Preferred DNS Server: _____ .
 - e. Alternate DNS Server: _____ .
9. Close all open windows.

1.1.10 Record Computer Name

1. Click **Start**.
2. Right-click the icon for **My Computer** and select **Properties**.
3. Select the **Computer Name** tab and press the **Alt + PrintScreen** key to print the full computer name.
4. Click **OK** and close any open window.

1.2 Install New Workstation

If necessary, install new Workstation or replacement RWS computer hardware according to EHB 9-720.

1.3 RRS Operating System (OS) for Gateway E6300 Computer

NOTE: The RWS (Ghost) Operating System, RWS (Build) Application Software, and OMS Software are only available on CDs directly from OPS23. The most current configuration of these software programs will be automatically provided to each site on a CD. RWS Software is not available for download from the OPS1 web site.

The RRS operating system (OS) is an NWS tailored version of Microsoft Windows XP professional. All CDs containing this tailored version are provided to sites by NWS Headquarters and are the only authorized OS approved for RRS Workstations.

1.3.1 General Description of the RRS OS

This procedure is for installing (Ghosting) the RRS OS as configured for the RWS into a new or replacement RWS computer, or to fix problems with a failed OS. RRS OS reinstallation is used in resolving problems between RWS software and hardware before returning an RWS PC to NRC for repair, and to return the OS to an authorized configuration if the current configuration is in doubt.

NOTE: The procedure for installing the RRS Operating System is the same for initial installation and reinstallation, except reinstallation requires that Site Data be backed up prior to installing a new version of the RRS Operating System. A complete set of RWS site specific data is available for reinstallation from the RRS CM database at: <https://ops13web.nws.noaa.gov/>.

Additional driver support for the RRS Workstation (short for RWS hardware and software assembly) is included in the RRS OS load as well as special modifications necessary to make the OS compatible with the RRS Workstation hardware. Other differences between the NWS and commercial OS versions involve security protocols required by DOC/NOAA/NWS. Unique user documentation and hardware diagnostics are also included in the RRS OS. The software issued by NWS for the RRS program is only licensed for use on RWS computers. Use on any other computer is unauthorized.

NOTE: RWS computers are received from NLSC without any bootable software on the hard drive. Field sites should expect a boot or media failure message followed by a system halt when the computer is first turned on. A failure message is normal.

The Workstation uses two hard drives. One hard drive is inside the computer and the other is an external USB hard drive. This procedure loads software onto only the hard drive inside the RWS PC. No preparation of the hard drive is required prior to initiating this procedure. It does not matter what the contents of the drive are; the drive requires no wiping, partitioning, or formatting.

Hard drive preparation takes less than 15 minutes to finish. Installing the RRS OS does not install any RWS.NET Application (Build) software.

CAUTION

All information stored on the internal hard drive prior to installing the RRS OS will be permanently erased.

1.3.2 Install RRS Operating System (OS) Software

Locate your RRS OS installation CDs. These CDs are not to be confused with any commercial CDs from either Microsoft or the PC manufacturer. The CDs are labeled with an NWS configuration number, OS type, and the brand/model of the RWS PC they support. The configuration number will change as updates are made. For example: NWS Configuration 1.01 of MS Windows XP for RWS PCs. The CDs are labeled CD1, CD2, etc. and show the total number of CDs in the set. For example: CD1 of 6.

NOTE: An RWS **Site Administrator** needs to record the IP address of the RWS PC before loading the OS, if the IP address is not available as previously recorded in section 1.1.9. The site must have a static (fixed and locally assigned) IP address specific for the RWS PC.

1. Insert CD #1 into the CD-RW drive.
2. Allow the changes to take affect by clicking: **Start**, then **Shut Down**.

3. Disconnect all external USB devices and device cables connected to the PC (printer, external hard drive, and any other USB devices attached). Do not disconnect LAN cable, Mouse, Keyboard, or Monitor.
4. Power-up the Workstation. The RWS PC boots off the CD and begins loading the RRS OS (ghost) software. Loading pauses with the following onscreen message:

NWS Configured Operating System for RWS Restoration Procedure

WARNING: Any existing data or operating system on your hard drive will be DESTROYED if you choose to continue!!!

*----- !!!!! IMPORTANT !!!!! -----
PLEASE MAKE SURE THERE ARE NO USB DEVICES ATTACHED TO THE PC!!!
If any USB hard drive, printer, etc. is connected to your PC
disconnect them NOW and then restart the PC.
-----*

***** Press Any Key to Continue *****

5. Press any key to continue.
6. On the next three screens, messages display to check and/or correct the time and date stored in your PC BIOS (CMOS memory).

NOTE: Setting the time and date using these screens sets the PC BIOS clock. The PC BIOS clock must be correctly set to the Universal Coordinated Time (UTC), prior to starting the RRS OS. Go back to the time or date setting until PC Bios are correctly set to the UTC. If unsure of the UTC time and date, verify the correct time and date at <http://www.time.gov> and select UTC at the bottom of the screen.

7. Manually enter UTC data into the time and date screens as follows:

NOTE

Ensure that you use Universal Coordinated Time

----- !!!!! UTC TIME & DATE !!!!! -----

1. First screen:

It is essential to set the current UTC time and date into you're PC BIOS (CMOS memory) prior to starting the operating system for the first time.

On the next two screens, check/enter the current UTC time and date, which will automatically be set into your PC BIOS.

***** Press any Key to Continue *****

2. Second screen:

Set the current UTC time:

If the time below is correct just press [Enter], otherwise correct it. If okay, press [Enter] again, or else press [Esc] to go back...

3. Third screen:

Set the current UTC date:

If the date below is correct just press [Enter], otherwise correct it. If okay, press [Enter] again, or else press [Esc] to go back...

NOTE: The mouse does not work at this point; use the Tab and Enter keys for "OK."

8. After the time and date have been set, the process of copying from CD1 to the RWS hard drive begins. A progress indicator across the top of the screen shows the percent of copying completed. When CD1 is finished copying an onscreen message displays:

Insert next media and press enter to continue...

9. Replace CD1 with CD2 in the CD-RW drive. Once CD2 is in place, press the **Enter** key (OK) to continue the copying process.
10. Replace CD2 with CD3 and press the **Enter** key (OK) to continue the copying process. Repeat this step until all have been copied. After the last CD is copied an automatic process runs that makes the OS unique, rather than an exact copy. No interaction is required. When the copy process is finished, the following screen appears:

++++ Remove the CD from the CD-ROM drive NOW ++++

----- Please Note and Remember -----

To log on to the default account:

USER NAME is: Administrator, PASSWORD is: n0aa:NW\$

The 0 in n0aa is a ZERO.

!!!!!! IMPORTANT !!!!!

Read and remember the entire box before doing as directed:

With all USB devices still disconnected, restart the system.

On the Windows desktop screen you will receive a System Settings

Change message box asking, Do you want to restart now? Yes/No.

Wait about 30 seconds until the system calms down, and then you

MUST respond: Yes to the question. After the system has

finished restarting, you may connect all devices, and then

install the RWS application software.

- - END - - -

11. Remove the last CD from the RWS Computer.

1.3.3 Steps Prior to Setting Up RWS Workstation

Perform the following steps prior to set-up of the Workstation:

1. With all USB devices still disconnected, restart the system by powering off and powering on (i.e., a hard disk boot) the Workstation.
2. Log onto the Workstation using the default Windows Administrator account - this may take up to one minute to appear. On the Windows desktop screen, a *System Settings Change* message box asks:
Do you want to restart now? Yes/No
3. Wait about 30 seconds, then, respond **Yes** to this question.
4. After the system has finished restarting, log onto the Workstation as the default Administrator.
5. Reconnect all USB devices that were previously disconnected. The USB Drive (E:) screen will appear (Figure 1-4).

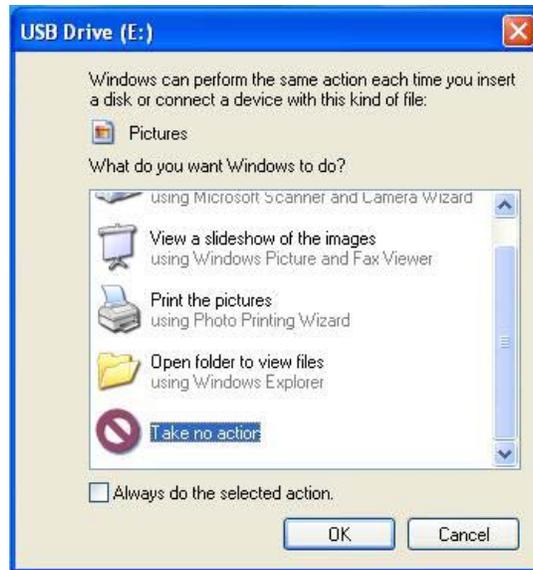


Figure 1-4: USB Drive (E:) Screen

6. Select **Take no action**. Click **OK**.
7. Set the connected printer as **Default Printer**. Press the **Alt + PrintScreen** key on the keyboard to print a copy of the *default printer selection* screen.

1.3.4 Enter Computer Name

1. Click **Start**, and create a link on the desktop to **My Computer** icon.
2. Right click the **My Computer** icon on the desktop.
3. Select **Properties** and then select the *Computer Name*.
4. Click the **Change** button, and type the Computer Name printed in section 1.1.10, or enter a new name according to NWS naming standards. Use the station WMO number to create name. For example, RRS-W-69011 where RRS is the organizational unit, W is the computer type, and 69011 is the unique computer identifier. If the name has a domain extension (e.g.: .rrs, or .noaa, or .gov), DO NOT add this to the computer name.
5. Click **OK** and close any open window.
6. The message appears *Do you want to restart your Computer now?* Select **NO**.

1.3.5 IP Address Reset

NOTE: A complete set of RWS computer IP Properties is available for reinstallation from the RRS CM database at: <https://ops13web.nws.noaa.gov/>.

Reset the IP address to the original IP address recorded in section 1.1.9 by performing the following:

1. Click **Start**.
2. Select **Control Panel**.
3. Look at the left side of the Control Panel screen to ensure the system is in *Classic View* (as shown in (Figure 1-5) and not *Category View*).

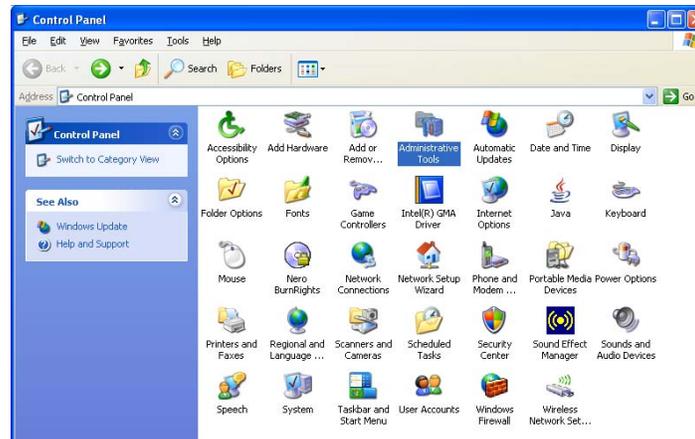


Figure 1-5: Classic View Display

4. Double click **Network Connections** icon.
5. Right click **Local Area Connection**.
6. Select **Properties**. The *Local Area Connection Properties* window appears.
7. Select **Internet Protocol (TCP/IP)** from the list. Click **Properties**. The *Internet Protocol (TCP/IP) Properties* window appears (Figure 1-6).

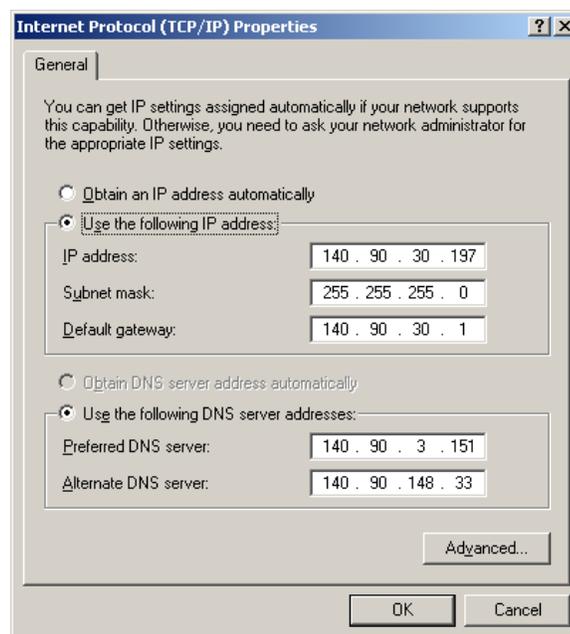


Figure 1-6: Internet Protocol (TCP/IP) Properties Window (Example only)

8. Select the *Use the following IP address:* radio button. The following text fields become available.

IP address:	XX.XXX.XX.XXX (Format only)
Subnet mask:	XXX.XXX.XXX.X (Format only)
Default:	XXX.XX.XX.X (Format only)

9. Enter the IP addresses (recorded in section 1.1.9) for your RRS Workstation (Do not use leading zeros).
10. Select the *Use the following DNS server addresses*: radio button. The following text fields become available.

Preferred DNS Server: XXX.XX.X.XXX (Format only) Alternate DNS Server: XXX.XX.XXX.XX (Format only)

11. Enter the DNS addresses (recorded in section 1.1.9) for your RRS Workstation.
12. Once the five fields have been entered and recorded with the station data, click **OK** in the Internet Protocol (TCP/IP) Properties window.
13. Click **Close** in the *Local Area Connection Properties* window.
14. Close *Network Connections* Window.
15. Allow the changes to take affect by clicking: **Start**, then **Shut Down**.
16. Select **Restart** from the menu and click **OK**.

NOTE: RRS sites not using NOAAnet communication need to go to Section 1.21 to install Windows security and create new user accounts in Windows.

1.4 Add RRS Workstation to NWS Domain (NOAAnet Users Only)

The initial RRS deployment installation will add the new RWS Workstation as a new computer to the NWS domain. The following procedure is used to perform this function.

NOTE: Software installer must coordinate with a local site domain Administrator to arrange support and other needed configuration changes prior to logon to RWS Operating System once NOAAnet connections are made.

1. Have the local site's domain Administrator pre-stage the computer object in the nws.noaa/RRS/Computers group (under the RRS Organizational Unit of the nws domain; refer to NWS Active Directory Standard Operating Procedure NADS-0007 for specific instructions). Do not add the computer to the local site's Computers group.
 - a. Using the Administrator's computer, ensure the nws.noaa/RRS OU is accessible in the *Active Directory Users and Computers* administrative tool. If it is not accessible, right click the region domain name and select change domain and type nws.noaa and click **OK**.
 - b. Navigate to the nws.noaa/RRS OU and add the RWS computer to the Computers group. (At a later time, headquarters administrators will move the computer to the RRS-OPS-Computers group for permanent operation and receipt of more complete global policies, including disabling of the screen saver function. RWS functions properly in either group.)
2. Log onto the RWS Workstation using the default Administrator account.
3. The local site's domain Administrator should then join the computer to the nws.noaa domain (see NADS-0007, Client Configuration and Active Directory Joining Procedures). When done

from a regional site, the complete domain account name of the administrator is required (firstname.lastname@noaa.gov) when permission is requested to join the domain.

4. Also, provide the First and Last Name of the local RWS Site Administrator to the domain Administrator so their domain account can be added to machine's Windows Administrators group to allow them to complete the RWS setup.
5. After the workstation has been added to the domain, log onto the workstation using the RWS Site Administrator account and click **Start\All Programs\Accessories\Command Prompt**.
6. At the prompt, type: **gpupdate / force** and then press **Enter**. Wait until the group policies have been updated and close the *Command Prompt* window.

1.5 Automatic Installation of Windows Security Updates Daily - NOAAnet Only

Continuing Microsoft updates will be provided from NWS-S-WSUS update server. Currently, Windows critical updates, security updates, and routine updates are automatically approved and installed. Automatic install and reboots are scheduled to take place automatically at 8:00 UTC.

NOTE: After initial installation, the system is setup to automatically update MS Windows Security and McAfee Virus Security.

1.5.1 Security Update Conditions

The RRS is configured to check for, download, and install Windows Updates automatically. Updates are checked and downloaded in the background whenever the system is not busy. Downloaded updates are installed daily at a scheduled time, if the following conditions are met.

- This scheduled time is currently set for 8:00 UTC.
- If the system is turned off or asleep at the time the installation is scheduled, the installation does not take place until the system has been awakened.
- If any of the updates require a reboot of the system and a user without administrative privilege is logged on, then a message appears and a 5-minute countdown begins. The user can choose to terminate the countdown, which causes an immediate reboot, or do nothing and the reboot occurs at the end of the countdown.

1.5.2 Update Operational Scenario

Given the current automatic update parameters described above, a suggested operational scenario would be:

- Since the workstation may have been turned off or asleep at the scheduled update installation time, wake the workstation up (log on) 30 minutes before every flight to allow any pending installations to take place and any required reboots to occur.
- If there are special local circumstances and operational policy will allow, users with administrative privileges can adjust the automatic update feature.

1.5.3 Manual Update - Optional Microsoft Windows Security Update

Routinely (monthly) check to see if the RRS Workstation has automatically received the latest security updates from Microsoft. If not current, perform the following Windows manual update procedure.

1. Click the Windows **Start** button. Select **All Programs** and **Windows Update**.
2. In Internet Explorer, click **Express** for high priority updates. The computer will check for available security updates that have not been made to the computer. An update screen will indicate if updates are needed. If none are needed, proceed to Step 12.
3. To install updates, click **Download** and **Install Now**. Once the updates are complete, click **Close**. (This action will install the Windows Genuine Advantage Validation Tool, if necessary.)
4. Click **Continue** on the *Review your installation results* window.
5. When a list of high priority updates displays, click **Install Updates**.
6. In the EULA agreement window, click **I Accept**. The updates will install.
7. When the updates are complete, click **Install** for the Internet Explorer upgrade.
8. Click **I Accept** in the *agreement* window.
9. When prompted to authenticate Windows, click **Validate**.
10. Click **Next** in following window.
11. After installation is complete, click **Restart Now** to restart the RRS Workstation, if needed. If restarting is not required, close the *update* screen.
12. Close all open windows.

1.5.4 Manual Update - Optional McAfee Virus Security Update

Routinely (monthly) check to see if the RRS Workstation has automatically received the latest security updates from McAfee. If not current, perform the following McAfee manual update procedure.

1. Right-click the **McAfee shield** at the bottom of the screen.
2. Select **Update Now** (update in progress). If an error appears, click **Update Now** a second or third time until it disappears.
3. Click the **Close** button when complete.
4. Reboot the computer if prompted to do so.

NOTE: This step completes the installation of the RRS Operating System (OS) Software. Continue with RWS Operational Build Application Software Program Installation (Section 1.6).

1.6 RWS Operational Build Applications Software Program (RWS.Net)

NOTE: See sections 1.13 and 1.14 for additional information regarding RWS Application Software.

1.6.1 RWS Application Software Verification

Each site is responsible for verifying the version and uploading the latest RWS Operating System, RWS Application Program, and RWS OMS software onto the RRS Workstation computer. Use the OPS1 web page (<https://www.ops1.nws.noaa.gov>) to verify that the RWS firmware/software is the most current version. Verify the current firmware/software versions as follows:

1. First, identify and record the relevant RWS.Net software that is on the RRS Workstation.

2. Open Internet Explorer and go to the OPS1 web page: <https://www.ops1.nws.noaa.gov/> for a listing of current software versions.
3. Select **ART, RRS, RSOIS, Windprofiler** on left hand column. Click **OK** to dismiss security message.
4. Sign in with your NOAA email username and password.
5. Click **RRS Software Status** in the RRS Software Status section. The current RWS.Net software versions are listed.
6. Look under the *RWS Software Versions* category to verify that the software CD is the most current software version available.
7. If not most current RWS software, request a CD copy from OPS23.

1.6.2 RWS Application Software Installation Logon

1. Power on the RRS Workstation, if not currently on.
2. Log on to the *Microsoft Windows* using the username for the RWS Site Administrator Account.
3. Set the connected printer as the **Default Printer** for the RWS Site Administrator Account.
4. Double-click the **time** icon at the bottom right side of the screen, and click the **Time Zone** tab (Figure 1-7).



Figure 1-7: Workstation Date and Time Display

5. In the *Time Zone* tab, set the time zone to **(GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London**.
6. Uncheck **Automatically adjust clock for daylight saving changes**.
7. In the *Internet Time* tab, select *time-a.nist.gov*. Click **Update Now**.
8. Click **OK** to close the *Date and Time Properties* display.

1.6.3 Install RWS Build Applications Software

CAUTION

Always load RWS application software as RWS Site Administrator.

Never load RWS applications software as windows (default) administrator.

NOTE: See section 1.16 for re-installing RWS Build Application Software without also installing the Operating System.

1. Insert the **RWS Application Software** CD (RWS.Net) into the RWS PC. The InstallShield Wizard should automatically appear (Figure 1-8). If it does not automatically start after a few minutes, browse to the CD and double-click **setup.exe**. The following dialog menu will appear if this is the first installation.



Figure 1-8: InstallShield Wizard Menu

2. Click **Next**. Enter the appropriate **Station WMO Number** and **First Ascension Number** recorded in section 1.1.1. Click **Next** (Figure 1-9).

NOTE: These values must be entered in order to continue the installation. Ascension numbers may already have been assigned to flights run previously using MicroART, or an earlier installation of RWS. Enter the next number in the First Ascension Number box.

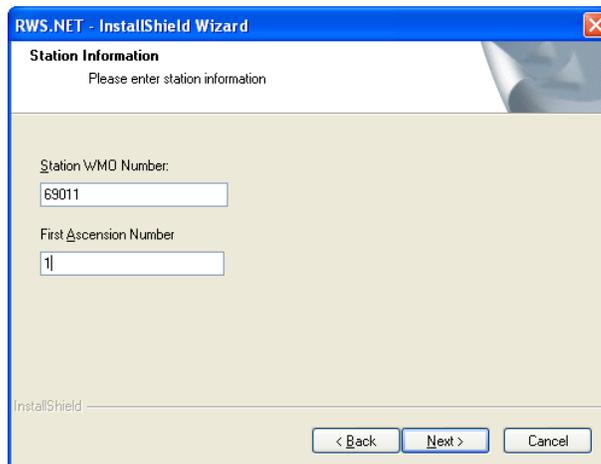


Figure 1-9: Station Information Window (Example)

3. Click **Install** to begin the installation.
4. *InstallShield Wizard* window indicates that the software load is completed. If this is the first time the software has been installed in the system.
5. Uncheck the **Launch RWS.NET** box, and click **Finish** to exit the installation.
6. Remove the RWS Application Software CD and restart the computer.
7. Log on to the system using the username for the RWS Site Administrator account.

NOTE: The RWS Software automatically creates *RWS* and *Capture* shortcuts.

8. Double-click **RWS** icon shortcut on the desktop to start RWS application software.
9. The *NOAA Warning* appears. Click **OK** (Figure 1-10).



Figure 1-10: NOAA WARNING Window

10. The *Master Station Data Initializing 2* message displays indicating that the WMO number was used to initialize Master Station Data (Figure 1-11). Click **OK** to proceed.

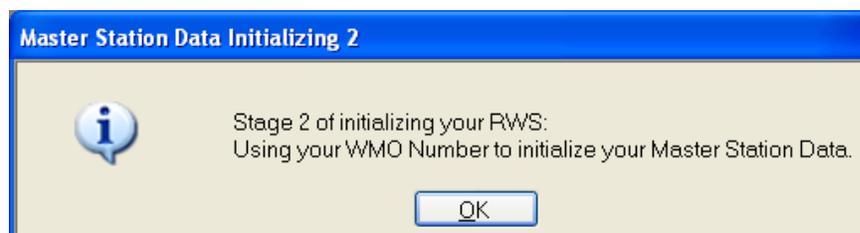


Figure 1-11: Master Station Data Initialization Window.

11. If the initialization is successful, the *Master Station Data Initialized* message is displayed indicating that the Master Station data was updated (Figure 1-12). Click **OK**.



Figure 1-12: Master Station Data Initialized Window.

1.6.4 Enter Local Station Data

1. The RWS Application Software indicates that the **Local Station Data** has NOT been properly initialized (Figure 1-13). Click **Yes** to properly initialize.

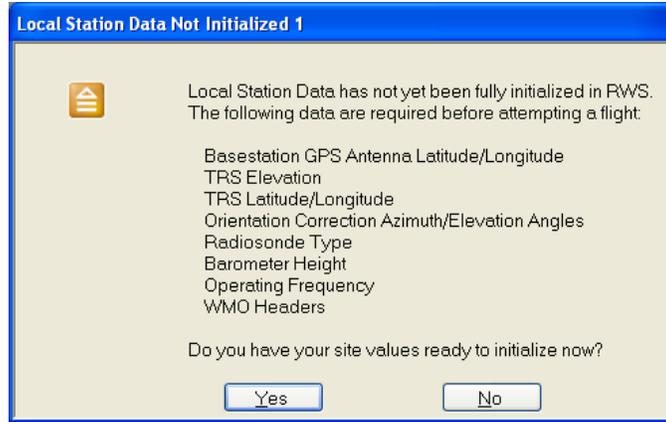


Figure 1-13: Local Station Data Initialization Window

2. The *Local Station Data Display* (Figure 1-14) appears. Enter the value recorded in section 1.1.5 for all the fields in **Local** section of the display (Except Release Point Pressure Correction).

NOTE: For re-installation, a complete set of Station Data for each RRS operating site is available from the Configuration Management database. Under Management Information System, click RRS Site Specific Data at:
https://ops13web.nws.noaa.gov/rupload/file_upload.file_upload_frame

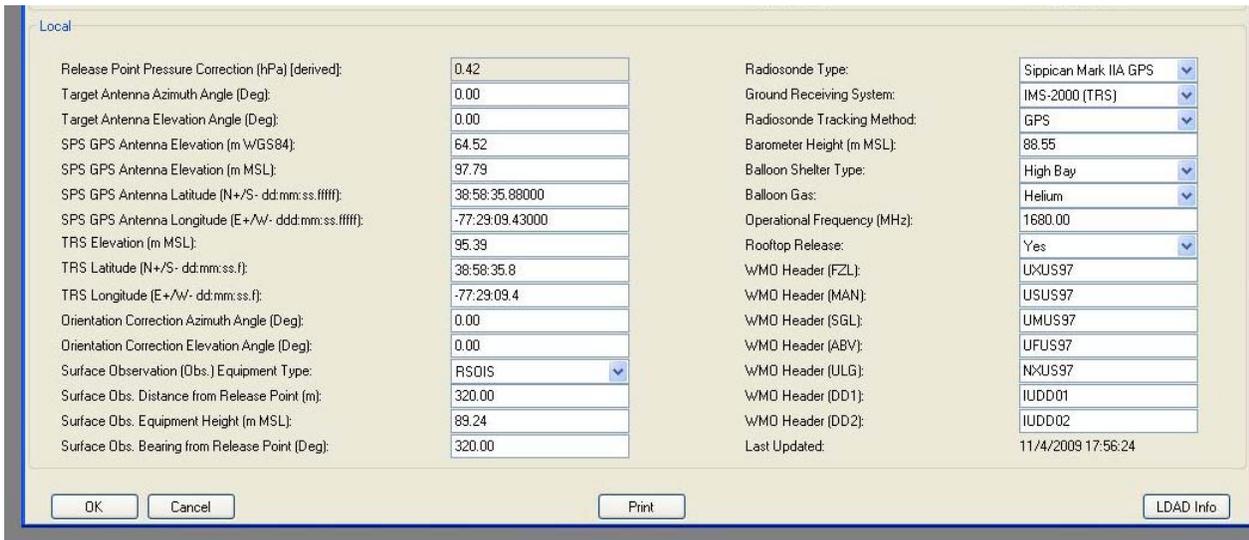


Figure 1-14: Local Station Data Display (Example)

- a. Release Point Pressure Correction (hPa) [derived]: the pressure difference between baseline point and the release point (i.e., balloon shelter) is a calculated value and cannot be entered. The value will be negative if the release point is higher than the baseline point.

NOTE: South entries for Latitude and West entries for Longitude will be preceded by a negative sign.

- b. Target Antenna Azimuth Angle (Deg): Enter the azimuth angle of the target antenna from the TRS antenna.
 - c. Target Antenna Elevation Angle (Deg): Enter the elevation angle of the target antenna from the TRS antenna.
 - d. SPS GPS Elevation (m WGS84): Enter GPS antenna elevation in Earth Ellipsoid Sphere in meters.
 - e. SPS GPS Elevation (m MSL): Enter GPS antenna elevation above mean sea level in meters.
 - f. SPS GPS Antenna Latitude (N+/S- dd:mm.ss.ffff): Enter GPS antenna latitude in the prescribed format.
 - g. SPS GPS Antenna Longitude (E+/W- ddd:mm.ss.ffff): Enter GPS antenna longitude in the prescribed format.
 - h. TRS Elevation (m MSL): Enter TRS elevation above mean sea level in meters.
 - i. TRS Latitude (N+/S- dd:mm.ss.f): Enter TRS latitude in the prescribed format.
 - j. TRS Longitude (E+/W- dd:mm.ss.f): Enter TRS longitude in the prescribed format.
 - k. Orientation Correction Azimuth Angle (Deg): Not applicable at this time.
 - l. Orientation Correction Elevation Angle (Deg): Not applicable at this time.
 - m. Surface Observation (Obs.) Equipment Type: Select appropriate option.
 - n. Surface Obs. Distance from Release Point (m): Enter appropriate value in meters.
 - o. Surface Obs Equipment Height (m MSL): Enter appropriate value.
 - p. Surface Obs. Bearing from Release Point (Deg): Enter appropriate value.
 - q. Radiosonde Type: Select appropriate option.
 - r. Ground Receiving System: (SPS type) Select appropriate option.
 - s. Radiosonde Tracking Method: Select GPS default.
 - t. Barometer Height (m MSL): Enter station specific value.
 - u. Balloon Shelter Type: Select appropriate option.
 - v. Balloon Gas: Select appropriate option.
 - w. Operational Frequencies (MHz): Enter 1680 default.
 - x. Rooftop Release: Select appropriate option.
 - y. WMO Header (FZL): Enter station specific value.
 - z. WMO Header (MAN): Enter station specific value.
 - aa. WMO Header (SGL): Enter station specific value.
 - bb. WMO Header (ABV): Enter station specific value.
 - cc. WMO Header (ULG): Enter station specific value.
 - dd. WMO Header (DD1): Enter station specific value.
 - ee. WMO Header (DD2): Enter station specific value.
3. Once the appropriate values are entered in the Local Section, print the screen. Have a second person verify all data entries.

1.6.5 Enter LDAD Information

NOTE: Procedures for the initial installation of a secure **ftp** for LDAD, see section 1.18. For LDAD password options see section 1.19.

1. Click **LDAD Info**.
2. Complete the LDAD info using the data backed up during Section 1.1.7.
3. Select the **LAN** connection and click **Edit**.
4. The *LDAD Data for LAN* display window appears - *LDAD Decrypt 1* (Figure 1-15). Click **OK**.

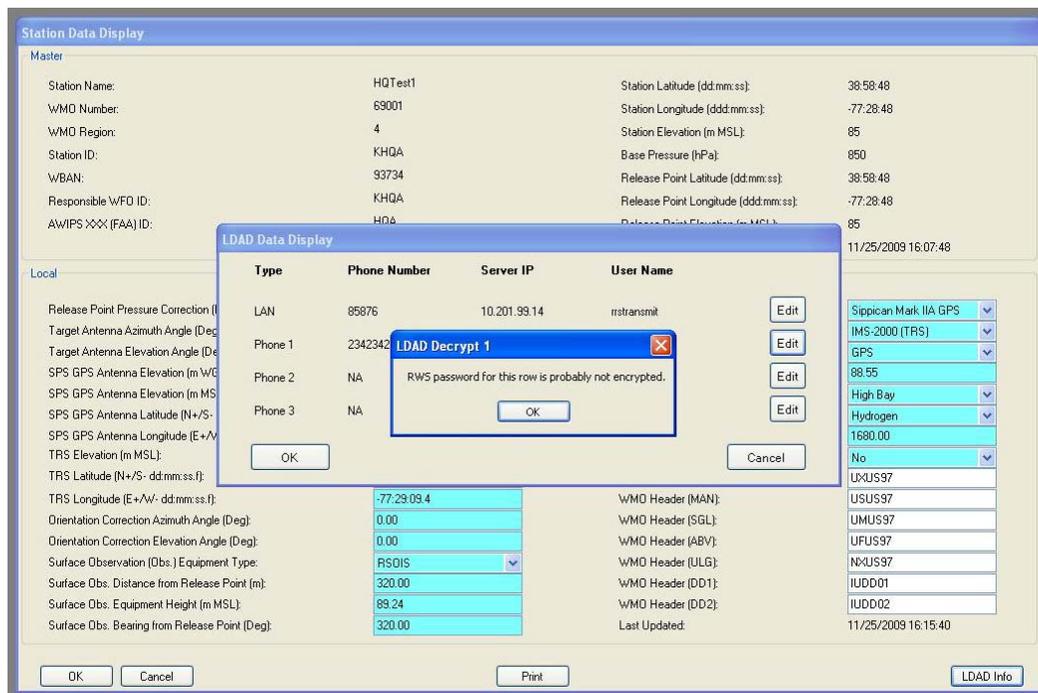


Figure 1-15: LDAD Decrypt 1 (Example)

NOTE: This LAN connection is the first attempt for transmitting a WMO Message.

5. Enter the appropriate server IP address (LDAD Server), User Name, and Password. Enter the password again for the *Verify Password* field.
6. Leave the phone number field blank for the LAN connection and click **OK**.
7. Select the **Phone 1** connection and click **Edit**. This connection is the first connection attempted for transmitting the WMO Message using backup dial-up connections.
8. Enter the appropriate **Phone Number**, **IP Address**, **user name**, and **password**. Enter the password again for the *Verify Password* field.
9. When finished, click **OK**.
10. Repeat Steps 5 through 8 for **Phone 2** and **Phone 3** for the second and third backup dial-up connections.

11. Once the LDAD information is entered, click **OK**.
12. Click **OK** to close and save the station data. The message *Local Station Data Sufficient* will appear.
13. Click **OK** on Station ID Data Display (bottom left).
14. Click **OK** to close and save the station data. Figure 1-16 indicates that the LDAD data updated successfully.

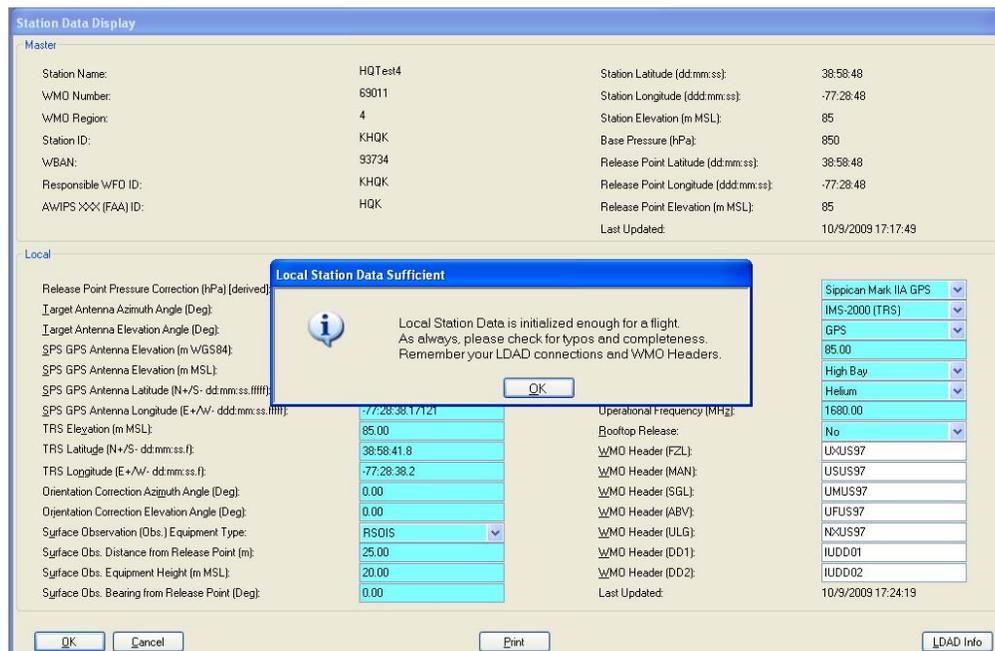


Figure 1-16: LDAD Data Updated Successfully Menu (Example)

1.6.6 Import and Restore Flights from RWS Backup

NOTE: If any .MDB or .MDF flight file is present in the RWSBackup folder, they will be automatically moved to another location. A message box will indicate the new location.

1. If the *Installation Restore* window appears (Figure 1-17), select **Import** to import flights from the backup folder (E:\RWSBackup).

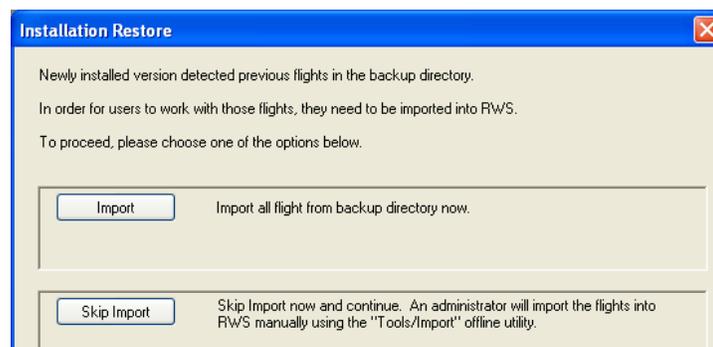


Figure 1-17: Installation Restore Window

2. If no flight import is not needed, proceed to section 1.6.7.
3. If flight data import is needed, the RWS directly opens the *Import Utility*. Click **Import**.
4. A pop-up window appears, showing *Successful Import of Flights*. Click **OK**.
5. If no flights imported, close *Import Utility* to exit screen.

1.6.7 No Flight Import Needed

1. The main RWS menu display will appear (Figure 1-18). Select **Enter offline mode** icon.

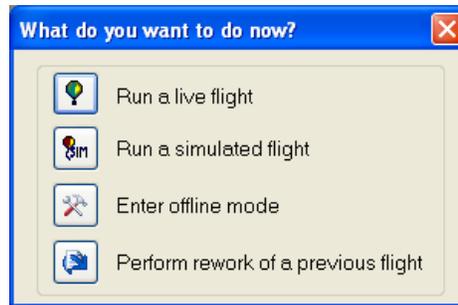


Figure 1-18: Main RWS Menu

2. If the message *It's been a while without a flight...* appears, click **OK**.
3. If the message *Synoptic flight was missed...* appears, click **No**. The main menu will appear.
4. Select the **Enter offline mode** icon.
5. Reopen the station data and print the screen.
6. Right-click the **Station Data Display** title bar and select **Print Station Data**.
7. Have a second person verify all data entries with the previously printed STATION_DATA.TXT.

1.6.8 Enter Master Station Data

NOTE: Use this section only for RRS Initial Deployment, or for RRS equipment site location change.

The Master *Data* portion of the *Master Station Edit* screen (not the same as WMO Station Data) is available on the OPS13 *Website*.

1. Open the [OPS13 Website](https://ops13web.nws.noaa.gov/rrsupload/file_upload.file_upload_frame) using noaa.gov e-mail user name and password (https://ops13web.nws.noaa.gov/rrsupload/file_upload.file_upload_frame).
2. Select the **Site Specific Data** (for site X) from the pull-down list. Click **View Site Data**.
3. Print the Site Specific Data (for Site X) from the Website.
4. Using the printed Site Specific Data from the OPS13 Website, verify the Master Station Data.
5. If the OPS13 Website is unavailable, use the previously saved and printed data from Section 1.1.5 to verify the Master Station Data.
6. Enter the RRS Site Specific Data into the RWS Master Station Data as follows:

NOTE: The station data, including data to identify the station, and the station and release position data will appear in text. There are edit fields for the new values.

- Close the RWS.NET application software.
- Insert the CD for RWS Operational Application Software (currently Build 2.0) into the RWS computer.
- Browse on the CD to the *Utilities* folder.
- Run **MasterEdit.exe**. The following dialog will appear (Figure 1-19).

The screenshot shows a dialog box titled "Master Station Edit". It contains the following fields and values:

WMO Number:	72403	
Station Name:	Sterling, VA	
WMO Region:	4	4
Station ID:	KIAD	KIAD
WBAN:	93734	93734
WFO ID:	KLWX	KLWX
AWIPS (FAA) ID:	IAD	IAD
Station Latitude (dd:mm:ss):	38:58:33	38:58:33
Station Longitude (ddd:mm:ss):	-77:28:37	-77:28:37
Station Elevation (m MSL):	84	84
Base Pressure (hPa):	850	850
Release Point Latitude (dd:mm:ss):	38:58:36	38:58:36
Release Point Longitude (ddd:mm:ss):	-77:28:38	-77:28:38
Release Elevation (m MSL):	86	86
Master Station Data Version:	1.0.0.12	1.0.0.13

Buttons: OK, Cancel

Figure 1-19: Master Station Edit (Example)

- Enter the new Master Station Data for the Station and Release positions. The Station values reflect the position of the PDB. The Release values reflect the position of where the balloons are released.
- The Version field is helpful to determine if the RWS has loaded and is using the new values. An incremented Version will be pre-filled, and does not need to be changed for the installation.

NOTE: Do not change the Station Name, WMO Region, Station ID, WBAN, WFO ID or AWIPS (FAA) ID (this information is pre-loaded). This information is critical for successful data transmission.

- g. When the new data is entered, click **OK**. If successful, the following message will appear (Figure 1-20).



Figure 1-20: MasterEdit Update Successful

- h. Close *MasterEdit*. Eject the CD.
- i. To verify the updated Master station data was successful, restart the RWS, go to offline mode, and open the *Station Data Display* menu (from the *View Station Info* menu item). (Figure 1-21).
- j. Re-check Master Station Data with Website data.

Station Data Display			
- Master			
Station Name:	HQTest4	Station Latitude (dd:mm:ss):	38:58:48
WMO Number:	69011	Station Longitude (ddd:mm:ss):	-77:28:48
WMO Region:	4	Station Elevation (m MSL):	85
Station ID:	KHQK	Base Pressure (hPa):	850
WBAN:	93734	Release Point Latitude (dd:mm:ss):	38:58:48
Responsible WFO ID:	KHQK	Release Point Longitude (ddd:mm:ss):	-77:28:48
AWIPS XXX (FAA) ID:	HQK	Release Point Elevation (m MSL):	85
		Last Updated:	10/9/2009 17:17:49

Figure 1-21: Master Station Data Display Menu (Example)

7. If the RWS Master Station data appears to be in error, contact the RRS Helpline at (301) 713-9800 or the Engineering and Acquisition Branch (OPS11) at (301) 713-1795.

1.6.9 Enter New Users for RWS

NOTE: The User Name is the identifier used to log on to RWS. The access level can be Trainee for people being trained, not yet permitted to run flights, Observer for regular observers/operators; and Site Administrator for users who will manage the RWS software programs.

Account Users must be added to RWS to provide access to the RWS programs. To add Account users perform the following:

1. Click the **Tools** menu and select the **Utilities** option. The *Utilities* screen will open (Figure 1-22).
2. Click **User Administrative Utility** under *Administrative Utilities*. The current user is already listed.

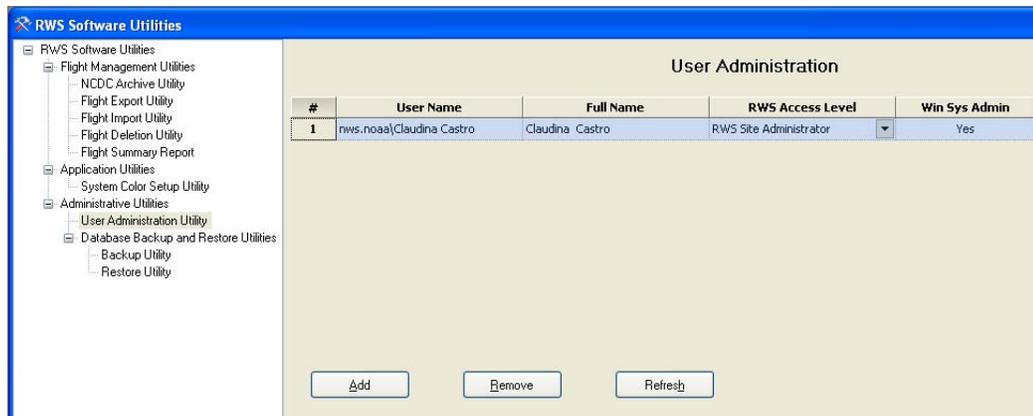


Figure 1-22: Software Utilities Screen (Example)

3. Select **Add** to enter a new RWS user. The *RWS–User Admin* window (Figure 1-23) will display.
4. Click on the **Domain User** tab if part of a domain. Enter first and last name for the user and click the search icon to search for the user account.

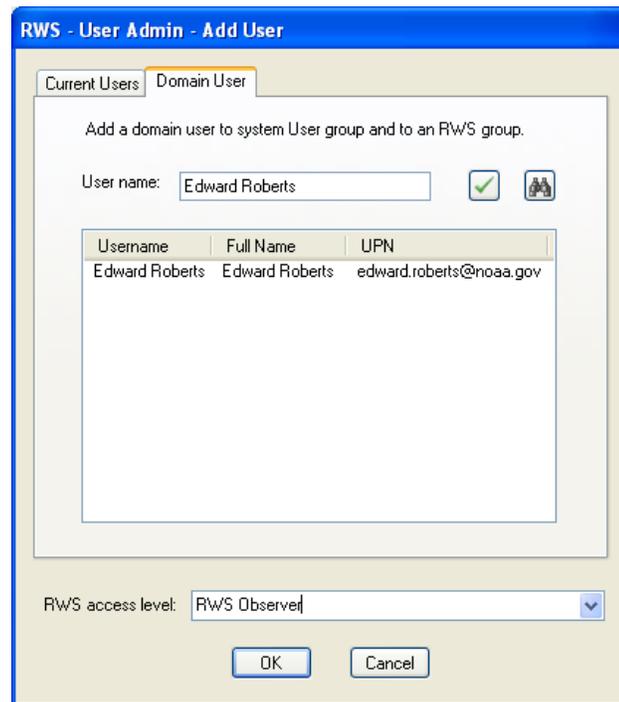


Figure 1-23: Add User Screen (Example)

5. Select **RWS access** level from the dropdown list box and click **OK**.
6. Repeat these steps for each RWS User (Figure 1-24).
7. Click **Flight** and select **Close**. The utilities menu closes.

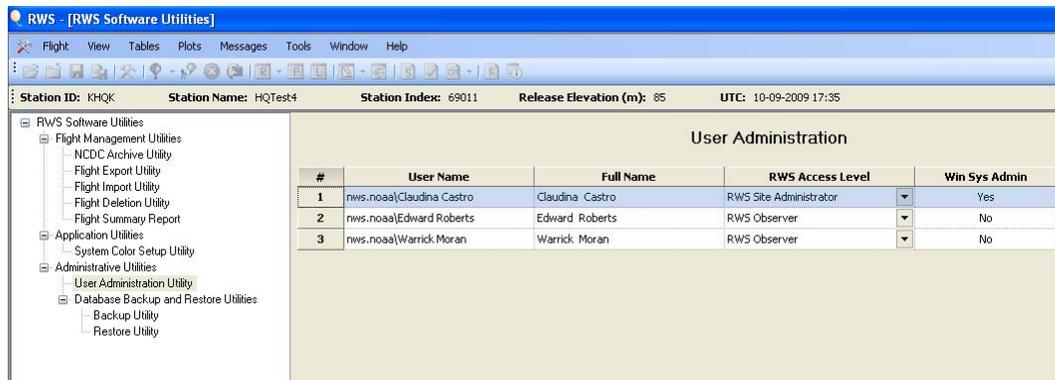


Figure 1-24: Add Additional Users (Example)

8. Click **Flight** and select **Exit** to close RWS.NET.

NOTE: See section 1.20 for password guidelines. See section 1.21 for creating new User Accounts in Windows.

1.7 Offline Maintenance Suite (OMS)

This section provides instructions for installing the OMS when the RWS Operating System has also been installed. If only the RWS Application Software program and OMS needs to be installed, see section 1.17

1.7.1 OMS Overview

The RRS Workstation is connected to a number of hardware devices (SPS, TRS, RSOIS, PDB, etc.) for live data. The RRS Workstation can also test these devices offline, using various programs collectively called the OMS.

The OMS is accessed through a desktop *RRS Offline Menu* icon that permits the user to select which port and which device to test. One of the programs is OBIT, used for testing the TRS and UPS. Other non-OBIT programs test the SPS, RSOIS, PDB, and AWIPS/LDAD.

OBIT is both a test program and an RWS application simulator. OBIT is a simple GUI built on top of the Radiosonde Protocol eXecutive (RPX) library program. OBIT is essentially a Windows user interface display and logger connected to the various Workstation devices' data streams (i.e., their serial ports or the equivalent ports of an external data pump). OBIT displays device status and enables running device Built-In Tests (BIT) for hardware status and diagnostics.

1.7.2 Install the RWS Offline Maintenance Suite (OMS) Software

1. If necessary, insert the RWS Application software CD (RWS.Net)
2. If the CD auto-boots, the *RWS Upgrade* screen appears. Click **Exit**. The desktop screen appears.
3. If the CD does not auto-boot:
 - a. Click **Start**, and then left click **My Computer**.
 - b. Select **CD drive (D)** with a left click.
 - c. Right click **CD drive**.

- d. Left click **Explore**.
- e. Double-click **OMS**.
- f. Double-click **Setup**. The *Installing the Offline Maintenance Suite* display appears (Figure 1-25).

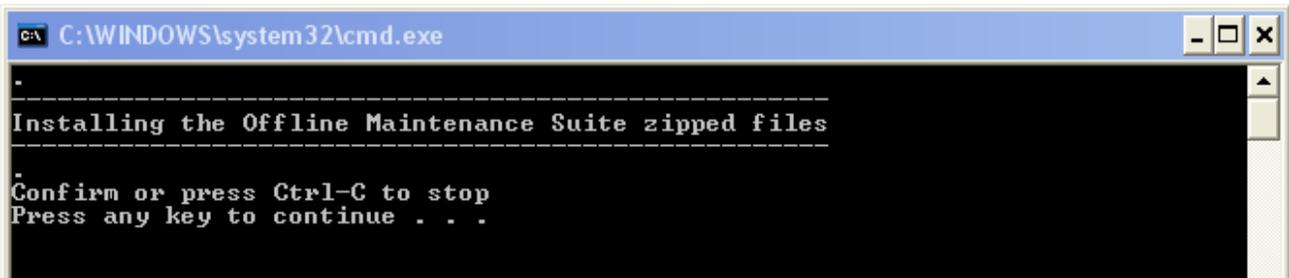


Figure 1-25: Installing the Offline Maintenance Suite Display

4. Press Enter to continue. Files are automatically unzipped and saved (Figure 1-26)

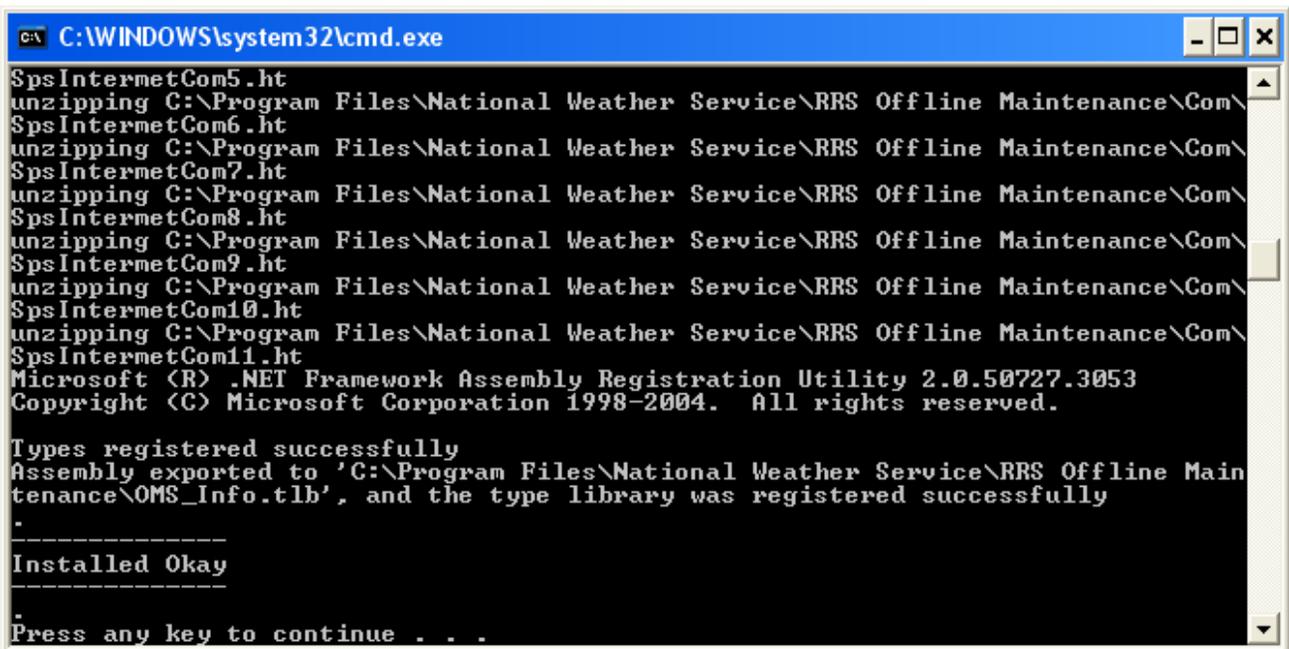


Figure 1-26: Installed Okay Display

5. When the installation is complete, press **Enter** to complete installation.
6. Close all screens. Desktop display appears. Remove the RWS Application software CD from the CD-RW drive.

1.7.3 Confirm TRS Station Data

Following OMS Software installation, perform the following steps to confirm the TRS station data matches the specific data stored in TRS location files:

NOTE: The TRS must be initialized.

1. Double-click the **RRS Offline Menu** (to start the OMS).
2. Setup the OMS Com ports as per Figure 1-28. (9,6,7,1,8).
3. Select **UPS Maintenance** from the OMS menu.
4. Power on the TRS by selecting the “**Power On**” option. Then close the UPS Maintenance window.
5. Select the **TRS Maintenance** option.
6. Click the **Mode** menu and select the **Terminate** option.
7. Click the **Setup** menu and select the **Station Data** option.
8. Check the TRS Station Data. Load station data menu fields (if not accurate) by entering the site’s station latitude and longitude (to nearest tenth of a second) as well as the applicable TRS Azimuth and Elevation values. See Figure 1-27 as an example of TRS Station Data.

NOTE: A complete set of TRS Station Data is available for reinstallation from Configuration Management database at: <https://ops13web.nws.noaa.gov/>.

Station Data		
RRS Station ID (K.xxx)	KSTB	
TRS Position		
Latitude (D/M/S.x)	38/58/43.0	
Longitude (W-, E+)	-77/28/39.0	
Altitude (m) (MSL)	89.9	
TRS Bearing-To		
	Az	El
Target	0	0
Baseline area	0	0
Release area	0	0
OK Cancel		

Figure 1-27: TRS Station Data Menu (Example)

9. Click **OK**.
10. Return to the **Mode** menu and select the **Initiate** option to start OBIT operation.
11. Close the OBIT. Returns to the *Offline Maintenance* Screen.
12. Click on **File** and **Exit**.
13. Close the screen.

1.7.4 Enter OMS COM Port Numbers

1. Enter the following Serial Com port numbers (Figure 1-28) into the *RRS Offline Maintenance Menu* (see Figure 1-33)

RRS Component	OMS Serial COM Ports
SPS	9
RSOIS	6
PDB	7
TRS	1
UPS	8

Figure 1-28: OMS COM Ports

2. Close the *Offline Menu* screen.

NOTE: A Local Archive Folder Shortcut to NCDC for New Users of RWS Build 2.0 (or later versions) Applications Program does not need to be created - the shortcut is now automatically created by the new Operating System 1.09 (or later) version software.

NOTE: The default printer will have to be reset to *HP DeskJet 5600* series for each user.

1.8 Restore LAN and Phone Connections and Data for LDAD and NCDC

During the RWS ghosting process, the RWS system hard drive will be completely erased. Critical files that were manually backed up can now be restored. Copy the following folders from the external USB Hard Drive (E :) to their original locations on the internal hard drive in the RRS Workstation:

1. Copy the contents of the **E:\LDAD** folder from E: to C:\LDAD. This folder contains the PuTTY keys necessary for message transmission.

NOTE: For Initial RRS Installations, see Section 1.18.5 and 1.18.6 for use of PuTTY to generate Keys for LDAD.

2. Copy the contents of the **E:\NCDC** folder from E: to C:\RWS\RWS\NCDC. This folder contains archived flights.

NOTE: For Initial RRS Installations, no archived flight data needs to be imported into RWS.

3. Restart the RRS Workstation.

1.9 Setup for Internet Transmission of Sounding Archives

Internet Explorer is automatically configured and setup when the RWS Applications Software loads. The purpose of Internet Explorer is to transmit archive files to NCDC. The RRS Program uses the RWS Application software to **ftp** zipped archive files after each flight to NCDC.

1. The Internet Explorer shortcut is automatically created when the RWS Operating System is loaded. However, if the RWS PC does not have an Internet Explorer icon on the desktop display, Open **C:\Program Files\Internet Explorer**. Right-click the file **IEXPLORE** and click on **Create Shortcut**. Click **OK** to create the shortcut on the desktop.
2. Double-click the **Internet Explorer** icon.
3. Create a favorite *FTP NCDC* using: <ftp://ftp.ncdc.noaa.gov/pub/upload>.

1.10 Conduct Upper Air Sounding and Verify AWIPS Acceptance

Conduct a live flight and verify that the coded messages are successfully transmitted by the RWS and viewable through AWIPS. Capture the first flight following completion of this software Note. Perform the following steps:

1. On the desktop, double-click the **Capture Utility** icon (Figure 1-29).



Figure 1-29: Capture Utility Icon

2. Select the flight from the *RWS Capture Utility* pull-down menu (Figure 1-30).

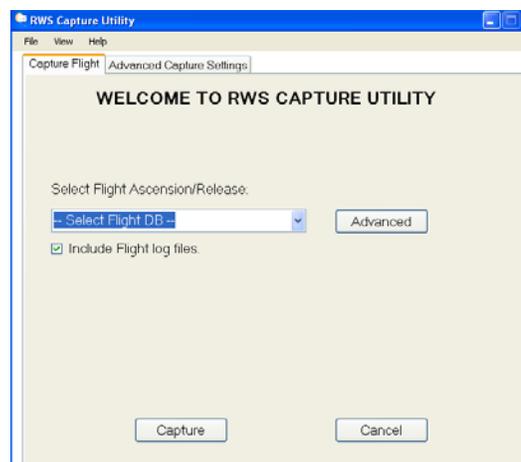


Figure 1-30: RWS Capture Utility Menu

3. Click the **Capture** button.
4. Click **OK** when the *Capture Successful* message appears.
5. Transmit operational flight coded message to LDAD.
6. Verify the receipt and accuracy of the message by looking at an onsite AWIPS terminal, or view the message at <http://www.weather.gov/data/>

1.11 Shutting Down RWS Workstation

1. Click **Start**, and then click **Shut Down**. The *Shut Down Windows* dialog box opens.
2. Click the arrow button to open the *What do you want your computer to do* list, then click **Shut down**.
3. Click **OK**. Windows shuts down and turns off the computer.

NOTE: If for some reason the *Turn Off Computer* option in Windows does not turn off the computer, press the power button on the front of the case. If this does not work, press and hold the power button for about five seconds, then release it.

1.12 RRS Help Desk

Collect as much of the following information as possible prior to calling RRS Help Desk Info:

- File Name.
- OBIT Information.
- Fault Isolation Problem.
- Possible Cause/Solution.

Contact the RRS Helpline 24/7 at 301-713-9800 or (during normal Eastern Standard Time working hours) the Engineering and Acquisition Branch (OPS11) at (301) 713-1842.

THIS COMPLETES THE INSTALLATION OF THE RRS SOFTWARE. THE REMAINDER OF THIS CHAPTER IS TO PROVIDE INFORMATION AND PROCEDURES FOR SPECIAL APPLICATIONS.

SPECIAL APPLICATION PROCEDURES

1.13 RWS Application Program General Information

This section provides general information on RWS Application (Build) Software.

1.13.1 RWS Application Software Description

The RWS Applications Program (Build) Software collects and processes upper air data from radiosondes. The system is interactive and allows a high degree of control over the display, edit, and transmission of data products. The RWS Applications Software runs the following functions:

- Flight software applications
- Control operations
- Limited telemetry analysis.

The RWS Applications Software includes a user interface based on the "Windows" model. The software provides flight management and other data cataloging and storage capabilities using an SQL relational database. The software is built on the concept of pre-processor software (i.e., SPS-based) and main processor software (i.e., workstation-based). The pre-processor software consists of all the operational modules necessary for data collection and conversion into meteorological values. The main processor software consists of all operational modules necessary to perform the following functions:

- Interfaces with the RSOIS and PDB to acquire surface meteorological data.
- Interfaces with the SPS to acquire flight meteorological data from the radiosonde.
- Interfaces with the TRS to control its pointing direction.
- Interfaces with NWS Headquarters (WSH) to receive master station data.
- Provides archive data to the National Climatic Data Center (NCDC).
- Performs quality analysis of SPS acquired data and on generated processed data.
- Processes data from the SPS into archive products and coded messages that are transmitted to the meteorological community via the Advanced Weather Interactive Processing System (AWIPS).
- Stores SPS-forwarded and workstation-processed data in a local database.
- Provides user interface functions to support pre-flight, baseline, release, flight, and "after termination" activities.
- Provides limited analysis-support tools.
- Supports live flight, rework, and simulated flight operating modes.

The primary components required for RWS Application Software installation on the RWS are:

- RRS Workstation (RWS) with Operating System installed
- RWS Application Software Installation CD
- Station Data for TRS and associated equipment
- LDAD contact information

- Initial Ascension Number
- RWS Applications Software Maintenance

1.13.2 RWS Application Program Description

1. **RWS.NET Application.** RWS.NET is the main program to make an upper air observation in RRS (Figure 1-31).



Figure 1-31: RWS.NET Application Display

2. **Capture.** Capture is a program that collects the diagnostic information used to troubleshoot a problem or bug with the RWS.NET Application software (Figure 1-32).



Figure 1-32: Capture Display

3. **OMS.** OMS is a utility that tests the hardware devices connected to the Workstation (Figure 1-33).



Figure 1-33: OMS Icon and Maintenance Menu

1.13.3 Files and Directories of RWS Application Software

1. C:\RWS\RWS\Capture.NET.exe – The Capture utility. This utility collects diagnostics for troubleshooting RWS.
2. C:\RWS\RWS\RWS.Shell.exe – The RWS application executable.
3. C:\RWS\RWS\Calibration Files – Directory for calibration files for radiosondes, which do not self-calibrate or transmit their calibration.
4. C:\RWS\RWS\Data Files – Directory for the database files used by RWS.
5. C:\RWS\RWS\LOGS – Directory for log files generated by RWS, if any.
6. C:\RWS\RWS\Radiosondes – Directory for radiosonde vendor specific DLL's.

1.14 RWS Application Database Tables

1.14.1 HQStation_2005.mdf

This database file has a copy of the Master Station Data supplied from WSH. It is imported into the RWS Application system using the *Master Station Data Update* offline utility in RWS Application.

1.14.2 RRSDB_2005.mdf

This database file contains the following:

1. tbl_Administrative – The pre-flight administrative data across all flights.
2. tbl_Equipment – The pre-flight equipment data across all flights.
3. tbl_FlightSummary – The flight summary data across all flights.
4. tbl_LDAD – The LDAD connection information.
5. tbl_PFSurfaceObservation – The pre-flight **Surface Data** across all flights.
6. tbl_PrimaryKey – The list of all flights in the directory, with flight identifying information.
7. tbl_StationCurrent – The station data used by each flight across all flights. This data is a snapshot of the local and master station data when the flight was flown.
8. tbl_StationLocal – The local station data for the station.
9. tbl_StationMaster – The master station data for the station.
10. Any other tables are used internally, or are unused. Do not modify the remaining tables.

1.14.3 RRSFlightTemplate_2005.mdf

This database file has the unpopulated versions of a flight database. It is copied at the beginning of a flight, to create all the tables. See Flight Databases below for more information about the tables.

1.14.4 Flight Databases

This database file contains the following:

1. tbl_Administrative – The pre-flight administrative data for the flight.
2. tbl_CalibrationData – A table with a BLOB for the calibration data if any.
3. tbl_CheckMessage – The check messages.
4. tbl_CodedMessage – The RADAT and WMO Coded messages.

5. tbl_Equipment – The pre-flight equipment data for the flight.
6. tbl_FlightRadioSonde – A table for a BLOB of the radiosonde DLL used when the flight was flown.
7. tbl_FlightSummary – The flight summary data for the flight.
8. tbl_LDAD – The LDAD connection information at the time that the flight was flown.
9. tbl_Levels – The Levels.
10. tbl_PFSurfaceObservation – The pre-flight Surface Data across all flights.
11. tbl_PrimaryKey – The flight identifying information for this flight, which is in the tbl_PrimaryKey table of the RRSDB.mdb database file.
12. tbl_ProcessedPos – The processed position data from the TRS and the PTU data.
13. tbl_ProcessedPTU – The processed PTU data.
14. tbl_RawPos – The raw position data from the TRS.
15. tbl_RawPTU – The raw (empirical from the radiosonde sensors) PTU data.
16. tbl_SmoothedWindAndPos – The processed position data from the GPS.
17. tbl_StationCurrent – The station data used by each flight for the flight. This data is a snapshot of the local and master station data when the flight was flown.
18. tbl_StationMaster – The master station data for the station when the flight was flown.
19. tbl_StatusMessage – The status messages.
20. tbl_SurfaceObservation – The RSOIS data.
21. tbl_SurfacePressure – The PDB data.
22. tbl_TRS_STATUS – A history of TRS status blocks.
23. tbl_UnSmoothedWindAndPos – The raw GPS data.

Other tables are used internally, or are unused. Do not modify any of the remaining tables.

1.15 RWS Application Software Utilities for Users

A Site Administrator or Observer/Operator uses utilities to accomplish numerous tasks and functions, such as archival, export, import, database management, and system setup. The RWS Application software (Figure 1-34) allows the users to go into the *Tools* option and select *Utilities* in the Offline mode. RWS Application Software Utilities has three major subsets:

- Flight Management Utilities
- Application Utilities
- Administrative Utilities

NOTE: Personnel logging onto the RWS APPLICATION software as Trainee are locked out from going into Utilities.

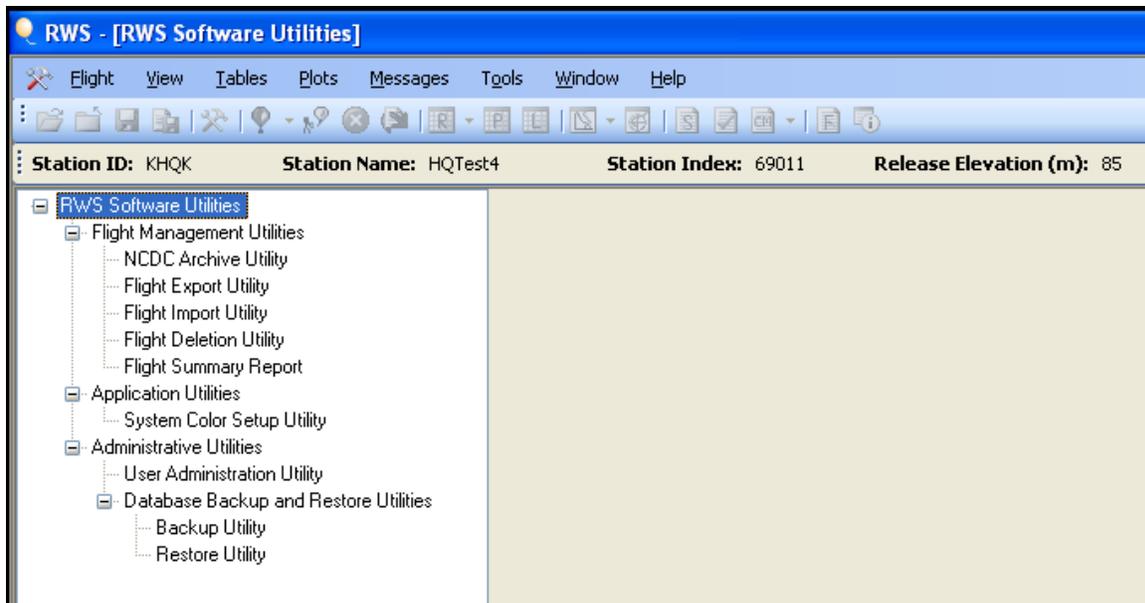


Figure 1-34: RWS APPLICATION Software Utility

1.15.1 Flight Management Utilities

The *Flight Management Utilities* has five options (Figure 1-34). An Observer or Site Administrator may enter the following utilities or tool areas:

- NCDC Archive Utility
- Flight Export Utility
- Flight Import Utility
- Flight Deletion Utility
- Flight Summary Utility

1.15.1.1 NCDC Archive Utility

Click the **NCDC Archive Utility** option (Figure 1-35). This utility allows the operator to create an NCDC archive to send to NCDC.

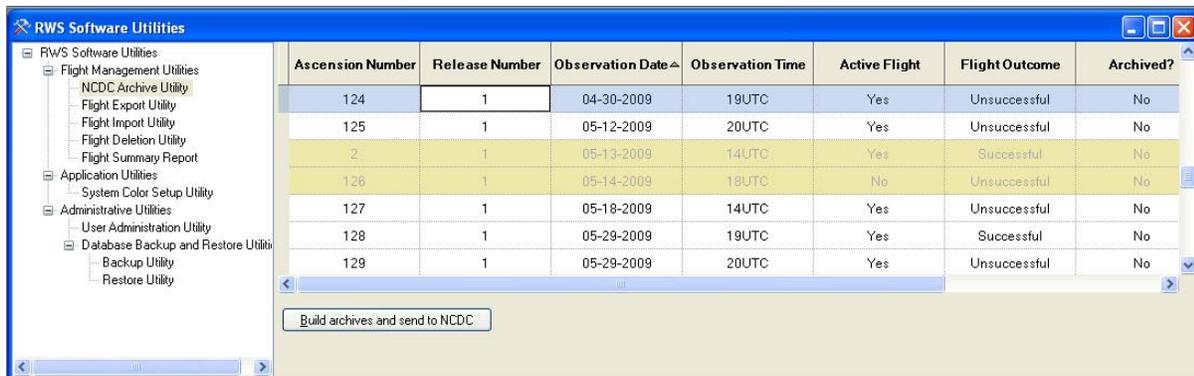


Figure 1-35: NCDC Archive Utility (Example)

1.15.1.2 Flight Export Utility

Click the **Flight Export Utility** (Figure 1-36). The operator may enter this utility to send file or flight information to another subdirectory or location.

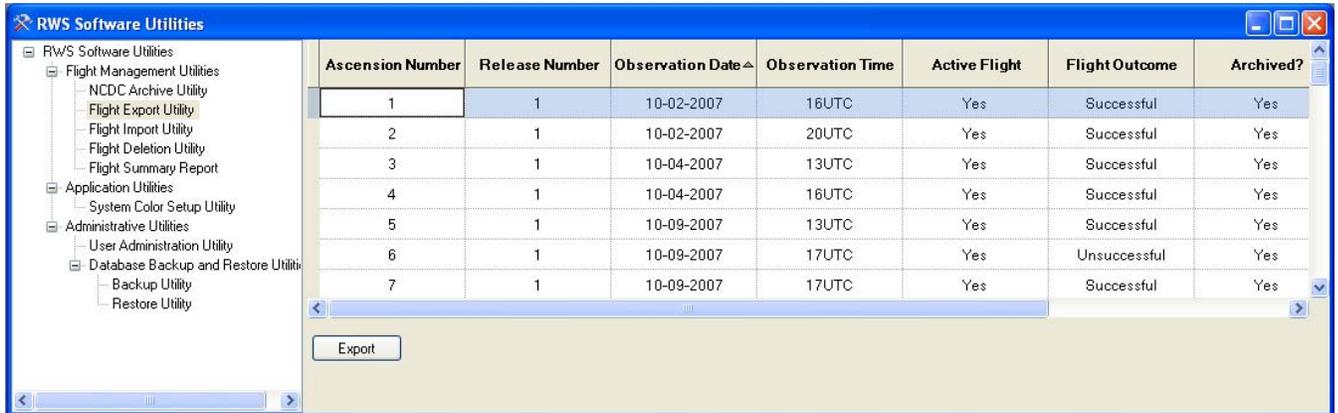


Figure 1-36: Flight Export Utility (Example)

1.15.1.3 Flight Import Utility

Click the **Flight Import Utility** (Figure 1-37). The Flight Import Utility allows the operator or user to import flights from different subdirectories or locations for quality control or use for training purposes.

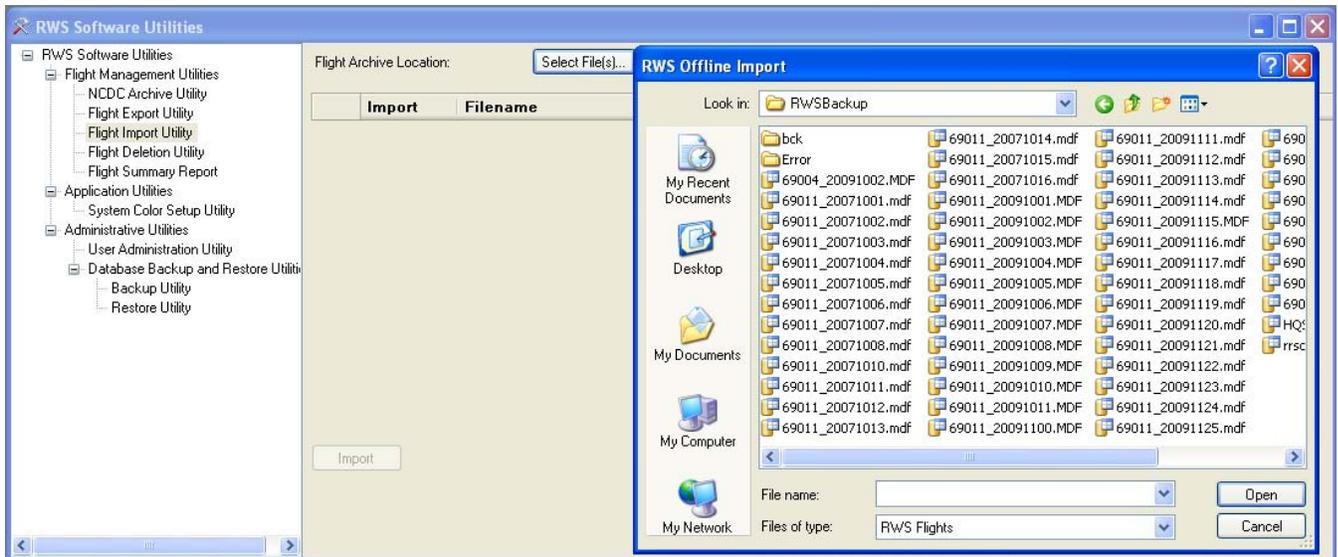


Figure 1-37: Flight Import Utility (Example)

1.15.1.4 Flight Deletion Utility

Click the **Flight Deletion Utility** (Figure 1-38). The Flight Deletion Utility allows the operator or user to delete unsuccessful or unarchived flights from the database.

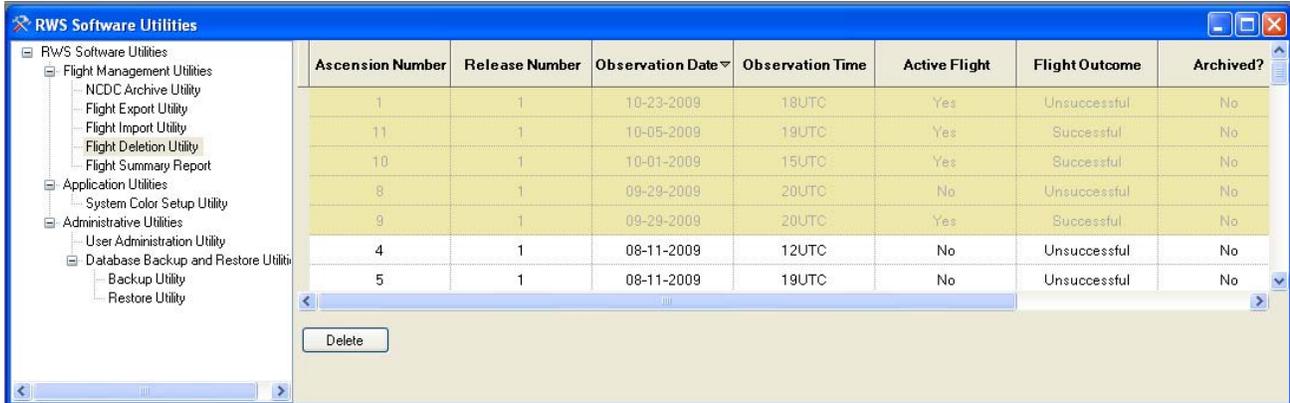


Figure 1-38: Flight Deletion Utility (Example)

1.15.1.5 Flight Summary Utility

Click the **Flight Summary Utility**. A window similar to Figure 1-39 will appear. The Flight Summary utility screen provides all the monthly report information. The information can be saved to a file and loaded into a spreadsheet. Sending this file will send in the monthly reports.

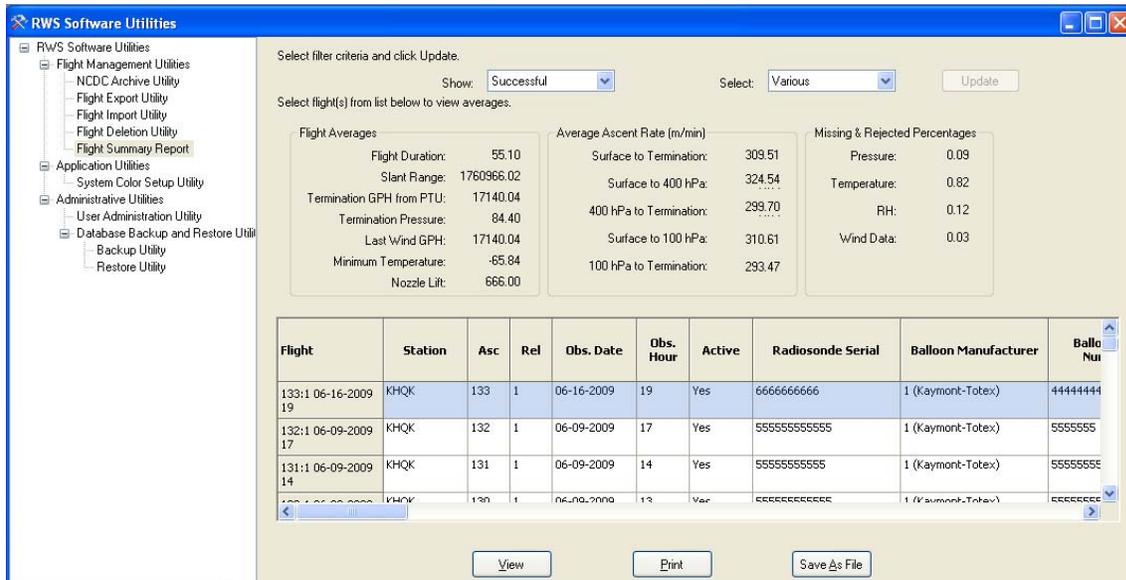


Figure 1-39: Flight Summary Report (Example)

1.15.1.6 Individual Flight Summary Display

The individual *Flight Summary* display shows critical flight performance data. Select the desired flight and then click **View**. A *Flight Summary* display similar to Figure 1-40 appears.

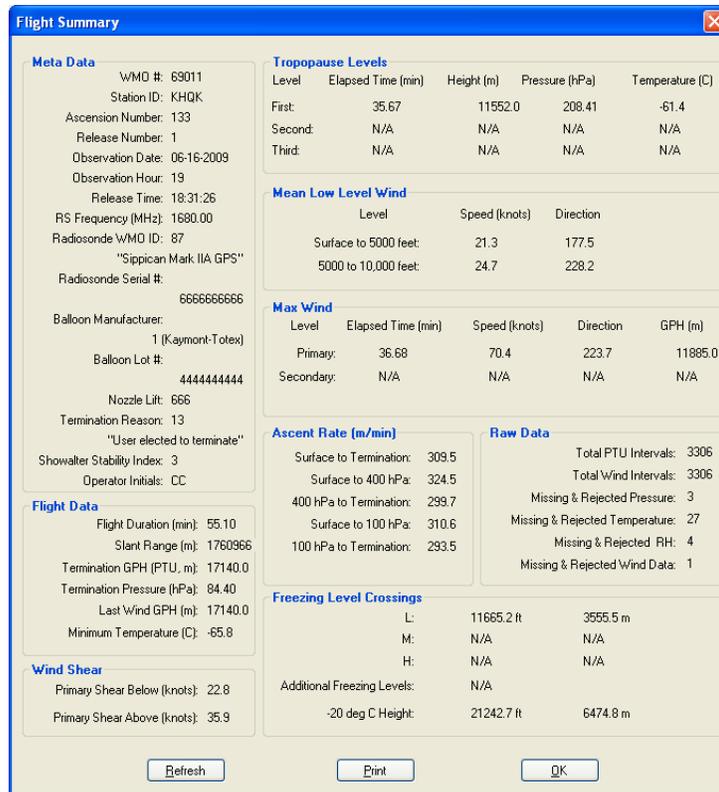


Figure 1-40: Flight Summary Display (Example)

1.15.2 Application Utilities

The *Application Utilities* allows the user to look at the color setup being used with the system for tabular data. A Site Administrator or Observer/operator may change these profiles. Select *System Color Setup Utility* (Figure 1-41). Changing colors requires only clicking the left mouse button on the desired color, a window appears, and then selecting the color you wish.

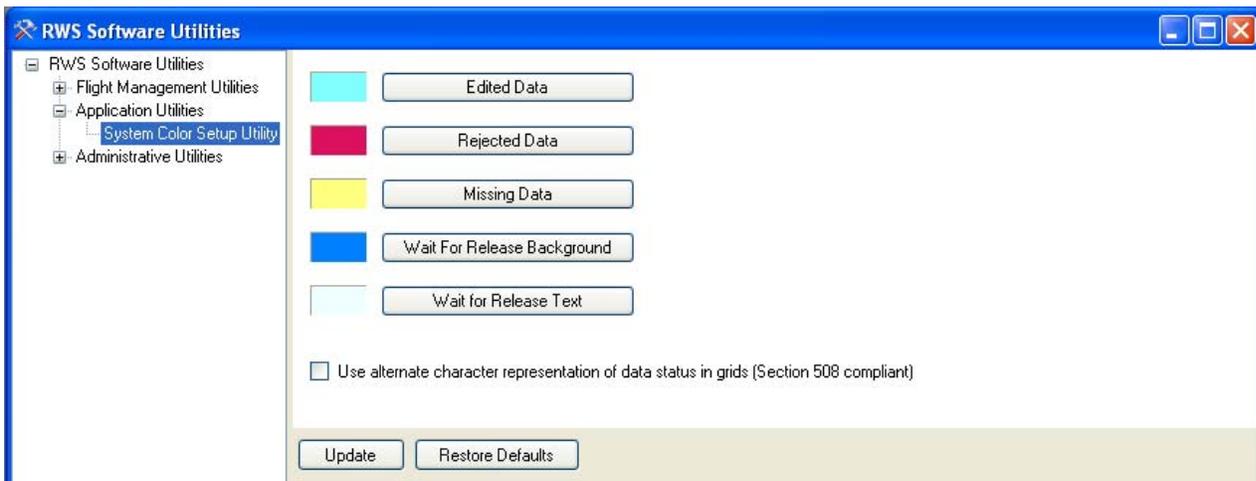


Figure 1-41: System Color Setup

1.15.3 Administrative and Data Backup and Restore Utility

The *Administrative Utilities* allows the operator to load calibration files and backup and restore files or flights. It also allows an Observer/operator or Site Administrator to change or reconfigure the Pre-flight Information used in the *Station Data* window and the *Pre-flight Displays*. This function also allows a Site Administrator to backup, restore, or unload (move) flights (Figure 1-42).

- **Backup:** Normally, flights are automatically copied to the standard backup directory. (This will likely be on the E: drive or C: drive if E: is not available.) This utility allows a Site Administrator to manually backup any list of files. You may also backup to a different directory, however, the restore will only restore from the standard backup directory.
- **Restore:** This function will take the files in the backup directory, and copy them into the main database area. Files will only be restored from the standard backup directory, and all files will be restored.
- **Move:** Running this utility copies all flights older than 120 days to a selected directory, and removes those flights from the RWS Application Software.

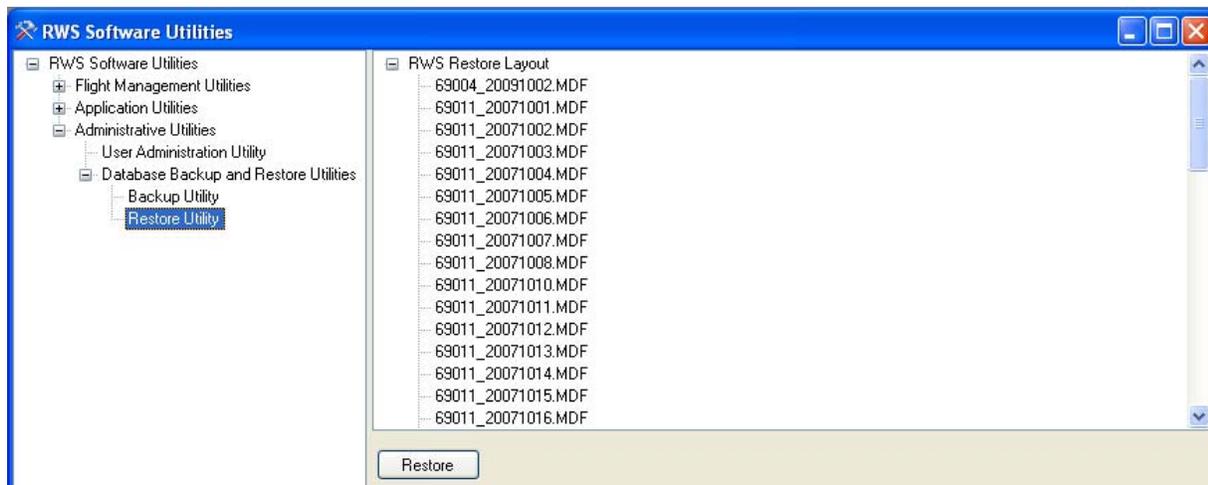


Figure 1-42: Restore Utility (Example)

1.16 RWS Build Application Software (Only) Re-Installation

If there is a malfunction or error with the RWS Build Applications Software, it can be re-installed without re-installing the RWS Operating System. This section covers the **stand alone** re-installation of RWS Build (Applications) software.

This section assumes that the RRS Operating System and the OMS software are both working and are not required to be reinstalled or ghosted.

NOTE: See OPS1 Website, **RRS Software Notes** for most recent RWS Operational Build installation information.

CAUTION

NEVER load RWS Applications software as the default Windows Administrator.

1.16.1 Creating a Secondary (Flight) Backup (CD)

Before beginning to install the RWS Applications software, ensure the secondary backup (CD) contains all flights from the previous 30 days. If this is not the case, perform the following steps to create the secondary (Flight) backup:

1. Create a new Windows folder on Local Disk C:\ called: *RWS CD Backup*.
2. Double-click **RWS shortcut** on the desktop to start the RWS application. The NOAA Warning appears.
3. Click **OK**. The main menu displays.
4. Select **Enter offline mode** icon.
5. Click the **Tools** menu and select the **Utilities** option. The utilities screen opens.
6. On the left side of the screen, double-click on **Flight Export Utility** (under Flight Management Utilities).
7. Select all flights for the past 30 days and click the **Export** button at the bottom of the screen. (Press the *Control* key while clicking in the first column to select multiple flights at one time. To select a range of flights, press the *Shift* key and select first and last flights of the range.)
8. At the *Export Flight* window, choose the **RWS CD Backup** folder on the C:\ drive.
9. Click **OK** to export flights, and then continue to click **OK** on the dialog boxes until the last flight is exported.
10. Select **Close** under the *Flight* menu. The *Utilities* menu closes.
11. Select **Exit** under the *Flight* menu. *RWS Application* closes.
12. Copy the *RWS CD Backup* folder from the C:\ drive to a CD and label it **RWS CD Backup**. This flight data will be needed as input in section 1.6.5.

1.16.2 Reload Upgraded RWS Application Program

1. Log on to the RWS Workstation using a RWS Site Administrator account.
2. Insert the RWS Application Software CD into the RWS PC. The following RWS Upgrade display appears (Figure 1-43). If it does not automatically appear, browse to the CD and double-click **setup.exe**.



Figure 1-43: Previous Installation Detected Display

3. Select **Next**.

4. After several minutes, the RWS Application upgrade is complete.
5. Check for flight data. If missing, re-install flight data saved in section 1.16.1.

1.16.3 Option - Removing the Old RWS Software Load - Only

Removing the RWS application software is not necessary and should not normally be performed.

NOTE: This section is provided for information only. See Section 1.16.2 for software upgrade procedures.

CAUTION

Removing RWS applications software will delete all flight data from the hard drive. Remove RWS Application software only if directed. For saving flight data, see section 1.16.1.

1. Log on RWS as the **RWS Site Administrator**.
2. Click **Start**.
3. Select **Control Panel** (Figure 1-44).



Figure 1-44: Control Panel Selection Display

4. From the Control Panel, double-click the **Add or Remove Programs** icon (Figure 1-45).

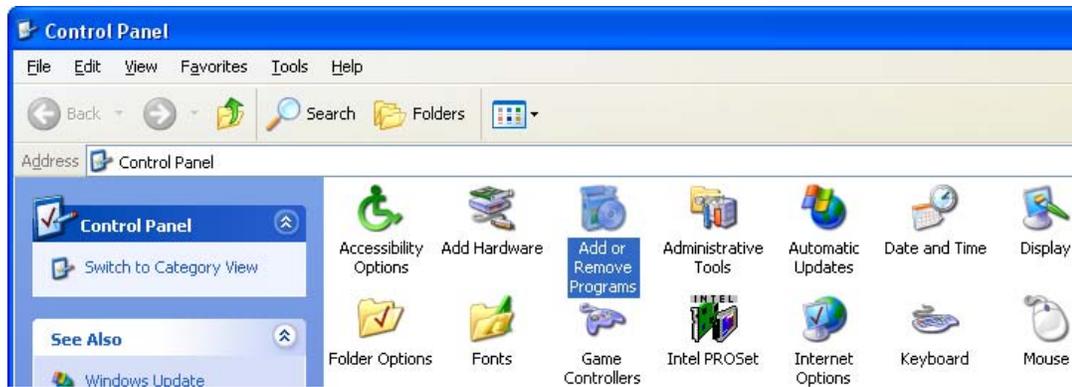


Figure 1-45: Add or Remove Programs Icon Display

- 5. From the *Currently installed programs* list, left-click the **RWS.NET** icon.
- 6. Click the **Remove** button on the right of the screen (Figure 1-46).

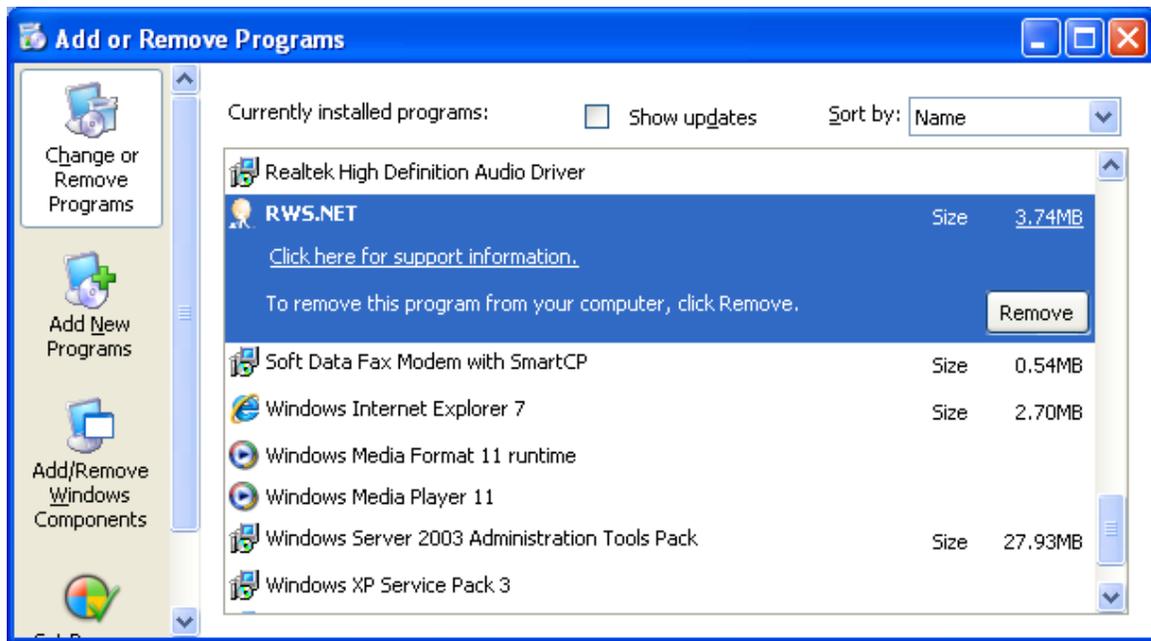


Figure 1-46: Remove the Old RWS Application Software Load Display

- 7. A Warning to confirm uninstalling is displayed as a last chance safeguard prior to removal. Click **Yes** to continue (Figure 1-47).



Figure 1-47: Last Chance Safeguard Prior to Removal Display

8. Click **Finish** on the *Uninstall Complete* window (Figure 1-48) to complete RWS Application software removal.

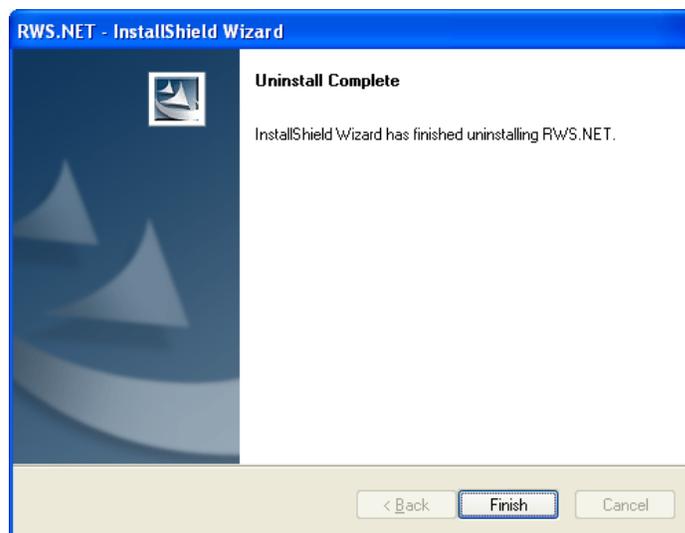


Figure 1-48: Complete RWS Application Software Removal Display

1.17 Removing and Re-Installing OMS Software - Stand-Alone

If there is a malfunction or error with the OMS Software, it can be re-installed without re-installing the RRS Operating System or the RWS Build (Applications) software. This section covers the **stand alone** removal and re-installation of OMS Software.

NOTE: If only the OMS Software is re-installed, it is mandatory that the OMS Software currently on the RWS computer be uninstalled first.

1. Double-click **My Computer**.
2. Insert the *RWS Application Software* CD into the RWS PC CD-RW (D) drive. If *RWS Upgrade* display appears, click **Exit**.
3. Click **CD-RW (D)** drive containing the RWS Application upgrade CD that includes the OMS software.
4. Click **File** and then **Explore**.

5. Double-click the **OMS Folder**.
6. Double-click **Setup** and click **Next**. The *InstallShield Wizard for RRS Offline Maintenance* screen displays (Figure 1-49).

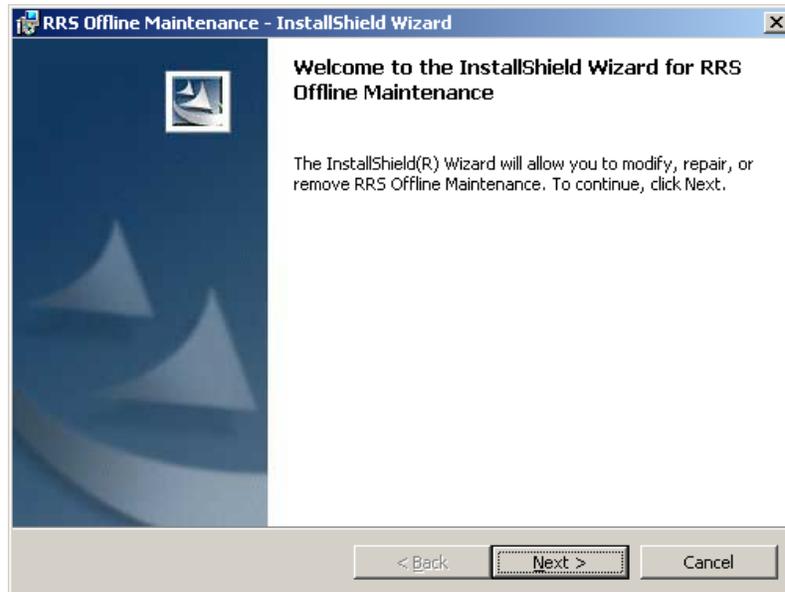


Figure 1-49: InstallShield Wizard for RRS Offline Maintenance Display

7. Click **Next**. The *Program Maintenance* screen (Figure 1-50) displays.

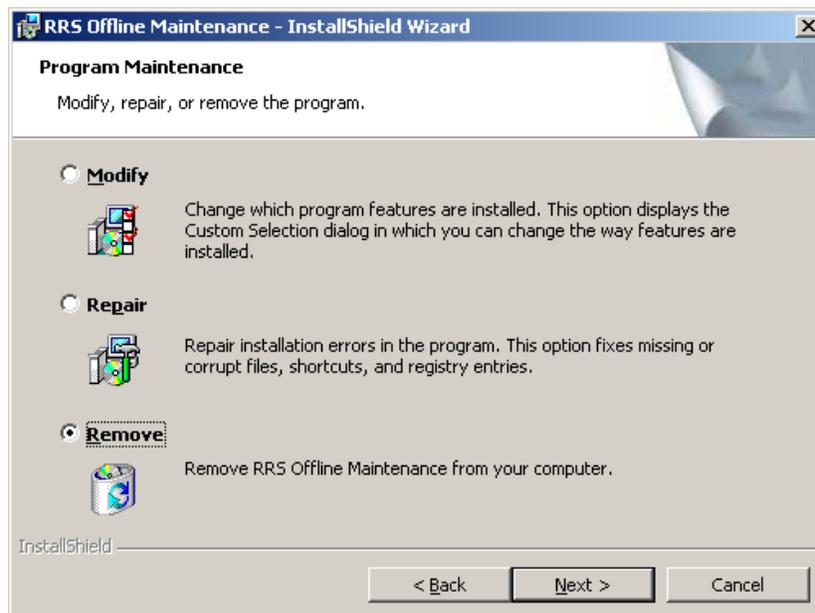


Figure 1-50: Modify, Repair, or Remove Program Display

8. Select **Remove** and click **Next**. The *Remove the Program* screen (Figure 1-51) displays.

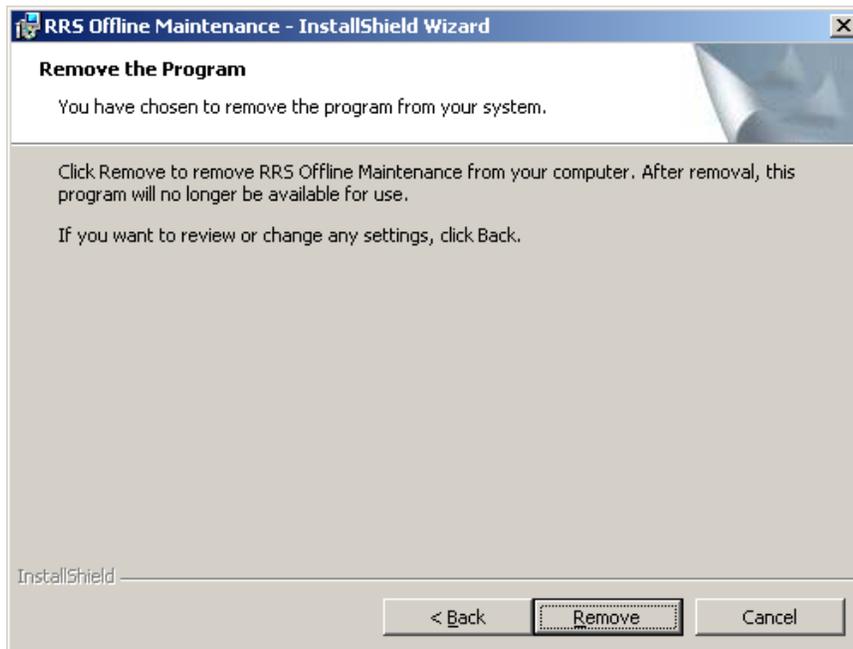


Figure 1-51: Remove the Program Screen

9. Click **Remove**. The *InstallShield Wizard Completed* screen (Figure 1-52) displays.

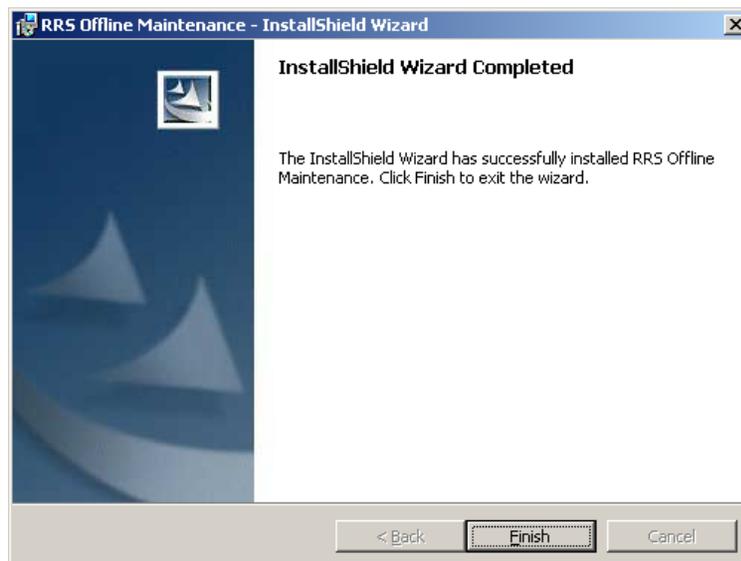


Figure 1-52: OMS Installation Complete Display

10. Click **Finish**. The OMS program is removed.
11. The *desktop* screen appears.
12. Left click **Explore**.
13. Double-click **OMS**.
14. Double-click **Setup**. The *InstallShield Wizard* display appears.

15. Click **Next**.
16. Click **Install** on the *Ready to Install the Program* display.
17. When the installation is complete, click **Finish**.
18. Close all screens. The desktop display appears. Remove the RWS Applications CD from the CD-RW drive.

1.18 RWS-LDAD FTP Initial Installation

LDAD interface activation instructions are in Engineering Handbook 13, Section 2.0, AWIPS RWS-LDAD System Administration Note 15. The following procedures are provided for the initial installation of a secure ftp for LDAD, including using puTTY to load public and private keys.

NOTE: Do not use leading zeros for PuTTY sessions or for Station/LDAD information. A leading zero implies Octal. Example: At the PuTTY window, typing in an IP address with leading zeros (*198.206.**034.011***) will give you an error. You must use numbers without leading zeros (*198.206.**34.11***).

1.18.1 RWS-LDAD Interface Activation Instructions

The Radiosonde Replacement System (RRS) will interface with AWIPS via LDAD. This interface will replace the existing dial-in MicroART interface, which is currently serviced by the LDAD executable suaReceiver, running on the LS1 (LDAD Server).

The Workstation sends data to LDAD across a LAN and/or via a phone line (dial-in). The transmission is one-way only: LDAD does not send any data or application level acknowledgments to RRS. Once the products are inside the firewall, they are processed by an LDAD pre-processor called preprocessRRS.pl.

NOTE: A complete set of AWIPS-LDAD Data is available for reinstallation from CM database at: <https://ops13web.nws.noaa.gov/>.

The preprocessRRS.pl performs several processing activities on the data files: storage into the Informix fxatext database, product dissemination to all WFO sites via the NCF/SBN, and product archival.

The main purpose of AWIPS-LDAD System Administration Note 15 is to provide activation instructions for the RWS-LDAD interface and the following:

- Describe the processing flow of data from RWS through LDAD and into AWIPS.
- Provide updates to reflect the new ULG (Upper Air Logistics) product introduced by the RRS program.

A site must have AWIPS Build OB5 or higher operational to have all the necessary files and AWIPS software to process RRS data via LDAD before the interface can be activated.

In addition, firmware for the LDAD modem must be version 8.1 to be compatible with a RWS modem. There are several files that must be set up in order for the software to function correctly. These files are described in AWIPS RWS-LDAD System Administration Note 15.

1.18.2 LDAD Delivery

The RWS delivers products to LDAD in one of two ways:

- SFTP over the local (site) LAN, used by sites where upper air and AWIPS LDAD are co-located.
- Dial-in using a PPP connection to perform SFTP file transfer of products, used at remote sites where upper air information is dialed into the AWIPS LDAD.

1.18.3 LAN Connections

The LAN connection at co-located sites is used during normal operations. Dial-in connections are used for service backup and for normal operations at remote sites.

- When a WFO is experiencing LAN problems.
- Sites where the RRS is not co-located with the AWIPS.

NOTE: Some sites have never been configured or had their LDAD systems activated, or the LDAD was manually configured without using baseline scripts. The AWIPS RWS-LDAD System Administration Note 15 contains steps for bringing these sites up to baseline status.

1.18.4 Public Keys Installation for Secure FTP from Workstation to LDAD Server

These instructions cover the quick installation for Secure FTP from the Workstation to the LDAD server.

NOTE: All user inputs are not case-sensitive on Windows (OS); however they are case-sensitive on the LDAD server.

In order to establish a connection to the LDAD and back-up servers, obtain the following parameters for the servers, if applicable (see Section 1.19):

- Phone numbers to the server for the RRS modem port(s).
- User ID for RRS on server.
- Password for RRS on server.

1.18.5 Generate Public and Private Keys on the Workstation (using PuTTY)

NOTE: Section 1.16.5 on generating keys is not activated at this time.

1.18.5.1 Workstation Procedure

At the Workstation, perform the following procedures:

1. Sequentially click **Start >> All Programs >> Accessories**.
2. Click the **Command Prompt**. The *Prompt* screen displays (Figure 1-53).
3. At the prompt, type **cd C:\LDAD**, then press **Enter**.
4. At the C:\LDAD prompt, type **PuTTYgen**, then press **Enter**.

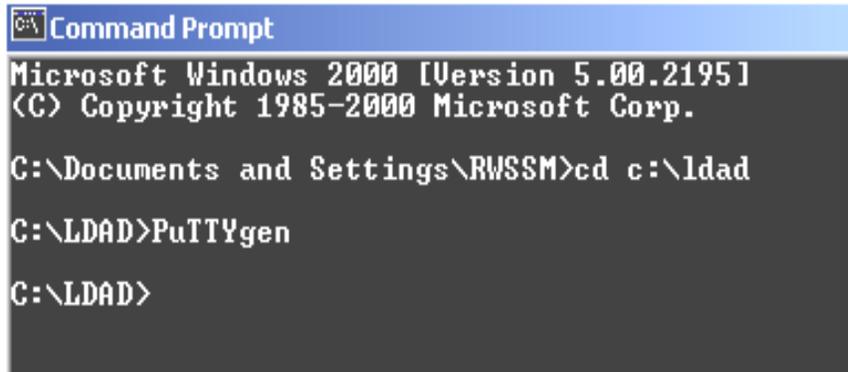


Figure 1-53: LDAD Command Prompt Display

- 5. A *PuTTY Key Generator* window appears. In the *Parameters* box, select **SSH2 DSA** (Figure 1-54).

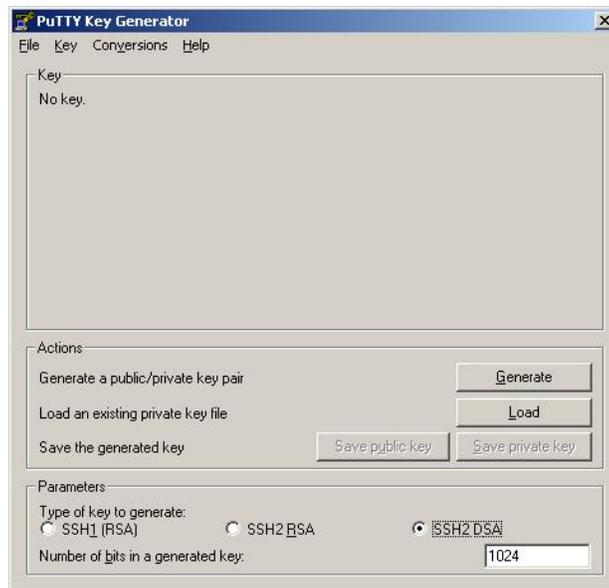


Figure 1-54: PuTTYKey Generator Display

- 6. Verify that **1024** is displayed for the *Number of bits in a generated key*.

NOTE: When the process of generating the key begins, move the mouse in circles over the blank area in the *PuTTY Key Generator* window. When the key generation completes, a key along with a new set of controls appear in the key window (Figure 1-55).



Figure 1-55: PuTTY Key Generator Window Start Generating Display

- Click the **Generate** button (Figure 1-56).

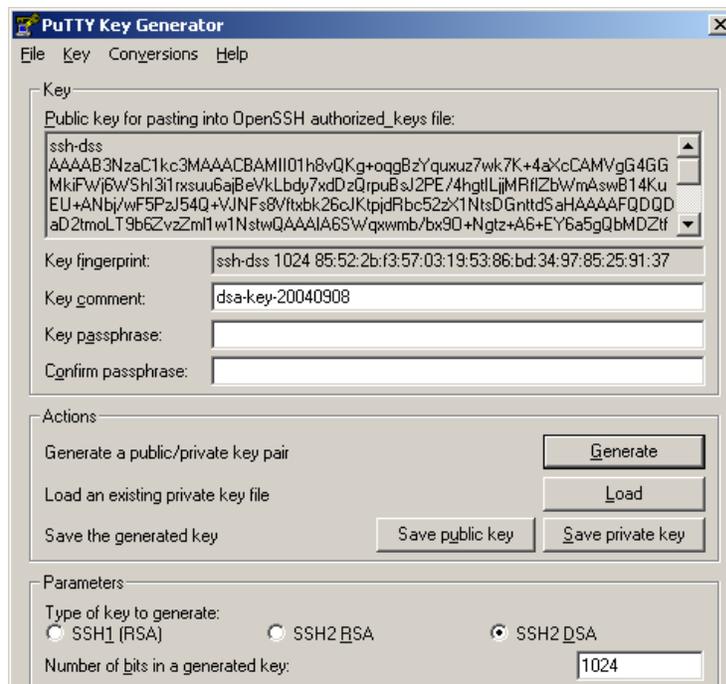


Figure 1-56: New Set of Controls Display (Example)

- Click the **Key comment** field and type in the unique (4 character) AWIPS Station ID (KCCC) at the end of the line. For example, dsa-key-20040812 **KHQA**.

NOTE: Use site's RRS station ID, not the LDAD server's AWIPS station ID, unless they are identical.

1.18.5.2 Private Keys

Save the private key by performing the following steps:

1. Click the **Save private key** button (Figure 1-56).
2. Click **Yes** to a popup window.
3. Specify **c:\ldad** as a directory.
4. Type in **AWIPS-RRS.PPK** as a file name.
5. Click the **Save** button.
6. Optional. If window appears, click **Yes** to overwrite a warning window.

1.18.5.3 Private Keys Backup Copy

Create a backup copy by repeating steps 1 through 6 in section 1.18.5.2 and specify **C:** as a directory.

1.18.6 Manually Save and Copy Public Key to the LDAD Server

1.18.6.1 Save Public Keys

The *Save Public* key does not save the key in PuTTY's native format that is expected by RWS, OMS and LDAD. Therefore, save must be done manually as follows:

1. Select (highlight) the entire text contents of the Public Key box (first box) (Figure 1-57).
2. Press **Ctrl + C** to copy it to the clipboard. The copied text ends with the unique (4 character) AWIPS Station ID.
3. Paste copied text into OpenSSH authorized-keys2 file box.

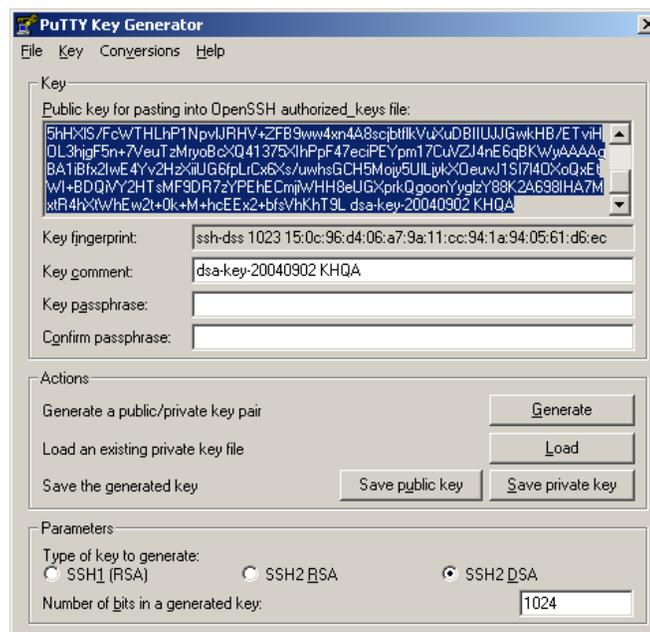


Figure 1-57: PuTTY Key Generator Selected Text Display (Example)

1.18.6.2 Start PuTTY

1. At the C:\LDAD prompt, type **PuTTY** and press **Enter** to start the PuTTY Configuration.
2. Type in the **LDAD server IP** address at the *Host Name* (or IP address) text box.
3. Verify/enter the authorized RRS **Port 22** to connect to LDAD. Select **Protocol SSH** and click **Open** (Figure 1-58).

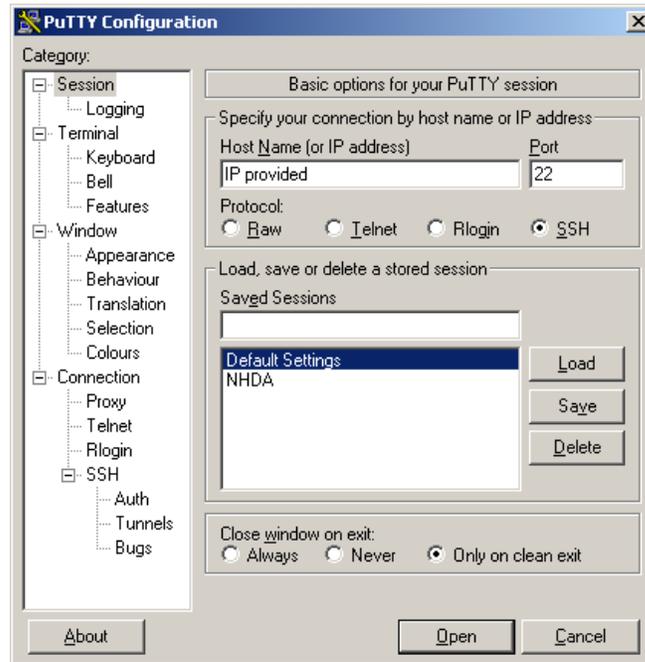


Figure 1-58: PuTTY Configuration Screen

4. If the *PuTTY Security Alert* window (Figure 1-59) displays, click **No** to proceed.

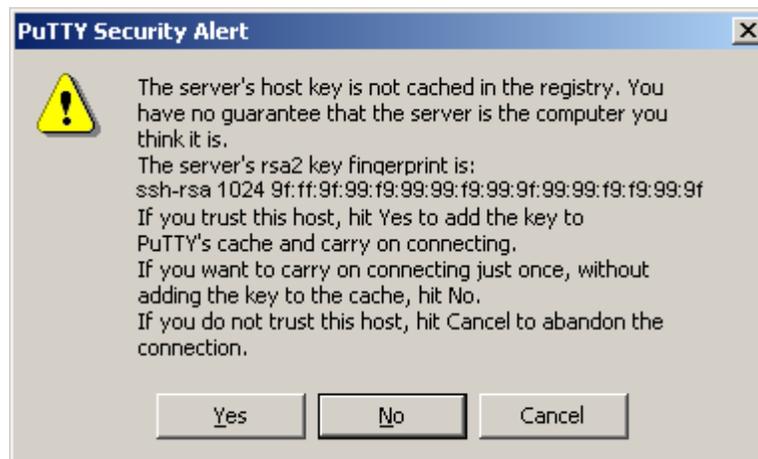


Figure 1-59: PuTTY Security Alert Window

5. Log on as RRS user by specifying RRS user name and password. A secure shell window is provided as the one shown in Figure 1-60.

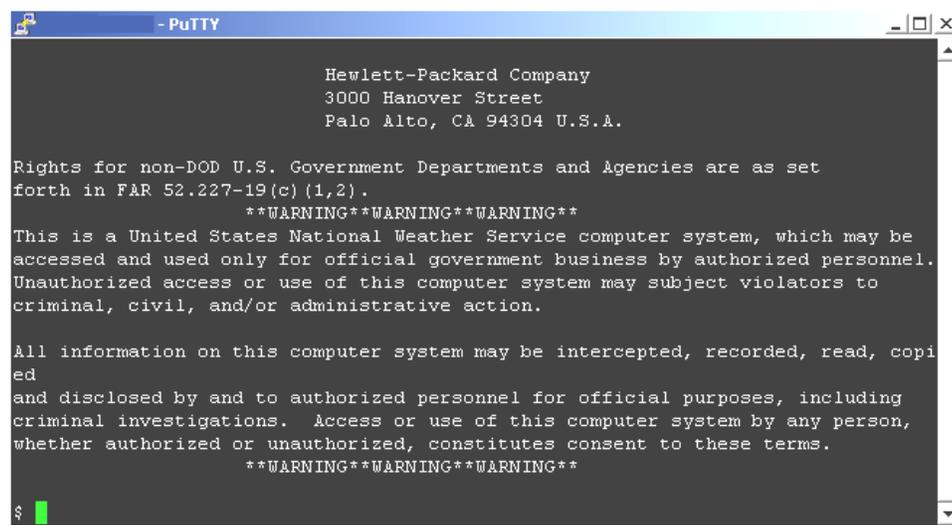


Figure 1-60: PuTTY Secure Shell Window

1.18.6.3 Enter Commands

At the secure shell window, enter in the following commands (bold fonts), after the \$ prompt:

1. \$ **ls -la** (to display the contents of the home directory).

NOTE: **l** is a lower case L.

2. Verify that the `.ssh` directory already exists. If the `.ssh` directory does not exist, create it by typing:

```
g. $ mkdir ~/.ssh
```

```
h. chmod 700 ~/.ssh
```

3. \$ **cd ~/.ssh**
4. **ls -l *.PUB**. However, if `RWS-Kxxx.PUB` exists, then remove or rename the file.
5. \$ **vi RWS-Kxxx.PUB** (where `xxx` = the site's UA station ID).
6. Enter **i** to start the vi insertion mode.

NOTE: The **i** is not displayed on the screen.

7. Right click the secure shell window to paste the clipboard contents from Section 1.18.6.1, or section 1.18.5.3.
8. Press the **Esc** key.
9. \$ **:wq!** to save the content and exit vi.

10. \$ **ls -l** to display the contents of the `ssh` folder.

1.18.6.4 Existing Authorization – Keys 2

If the `authorized_keys2` file exists in the `.ssh` folder, type the following commands (bold fonts). Otherwise, continue on to Section 1.18.6.5.

1. \$ **cp authorized_keys2 auth_keys_yymmdd** (yymmdd = today's date) to save the file.
2. \$ **cat RWS-Kxxx.PUB >> authorized_keys2** to append the new public key (where xxx = your UA station ID).
3. Go to Section 1.18.6.6.

1.18.6.5 Authorization Keys 2 – Do Not Exist

If the `authorized_keys2` file does not exist in the `.ssh` folder, type the following commands (bold fonts):

1. \$ **cp RWS-Kxxx.PUB authorized_keys2**(where xxx = the UA station ID).
2. \$ **chmod 640 authorized_keys2**.

1.18.6.6 Exit

After the \$ prompt type **exit** to close the PuTTY windows. The site is now set up to transmit products to LDAD via a LAN or a phone line from the Workstation to a co-located LDAD.

1.18.7 Establishing a Dial-Up Connection to a Remote LDAD Server

Perform this section for a dial-up connection to backup LDAD. This section is not required for a dial-up connection to co-located LDAD if section 1.18.5 and 1.18.6 has been executed. Establish a dial-up connection to the remote LDAD server by performing the following steps:

1. On the desktop, right-click the **Local Area Connection** icon located in the *Notification* area task bar (lower left corner of the screen).
2. Select the **Disable Option**. Proceed to establishing a dial-up connection for each of the backup servers.
3. On the desktop, sequentially click **Start >> Control Panel >> Network Connections** to open the window depicted in Figure 1-61.



Figure 1-61: Network Connections Window

- Click the **Create a new connection** link to start the *New Connection Wizard* Window
- Click **Next** to choose the connection type. Select the **Connect to the network at my workplace** option as depicted in Figure 1-62. Click **Next**.



Figure 1-62: Network Connection Wizard Window

- Select **Dial-up connection** (Figure 1-63). Click **Next**.



Figure 1-63: Dial-up Connection Window

- Type the name for your connection. The screen is shown in Figure 1-64. Assign a descriptive name for the LDAD server as appropriate. Click **Next**.



The screenshot shows a Windows-style dialog box titled "New Connection Wizard". The main heading is "Connection Name" with a sub-heading "Specify a name for this connection to your workplace." and a small icon of a telephone handset. Below this, it says "Type a name for this connection in the following box." and "Company Name". A text input field contains the text "DialUp Connection". Below the input field, it says "For example, you could type the name of your workplace or the name of a server you will connect to." At the bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

Figure 1-64: Completing the Network Connection Wizard

8. Type the phone number to connect to the server. Verify that all necessary codes to access outside lines for local and long distance calls are displayed. The window is shown in Figure 1-65. Click **Next**.



The screenshot shows a Windows-style dialog box titled "New Connection Wizard". The main heading is "Phone Number to Dial" with a sub-heading "What is the phone number you will use to make this connection?" and a small icon of a telephone handset. Below this, it says "Type the phone number below." and "Phone number:". A text input field contains the text "9301 999-9999". Below the input field, it says "You might need to include a '1' or the area code, or both. If you are not sure you need the extra numbers, dial the phone number on your telephone. If you hear a modem sound, the number dialed is correct." At the bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

Figure 1-65: Phone Numbers to Dial Window (Example)

9. On *Connection Availability* screen, select **Anyone's Use**. Click **Next**. Ensure " • *Share with all users of this computer*" is displayed. Click **Finish** in Figure 1-66.



Figure 1-66: Connection Complete

10. When the *Connect DialUp Connection* window opens, enter the LDAD **User name** and **Password** provided. Verify that the correct phone number and dialing rules are displayed. Click **Dial** and wait for the connection to complete. The *Connect* window is shown in Figure 1-67.

NOTE: The option to **Save user name and password** has been disabled for security reasons.

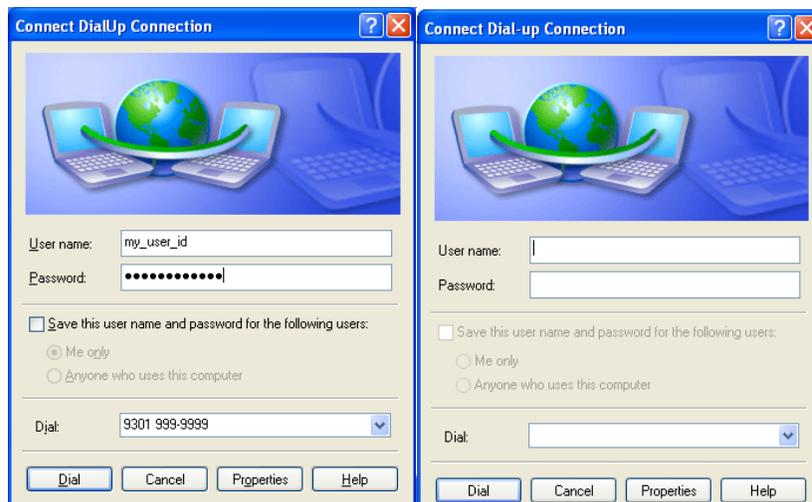


Figure 1-67: Connect DialUp Windows

11. Verify that the *Connection Complete* window (Figure 1-68) displays to confirm the connection with your particular local LDAD server name and click **OK**. After the connection has been

established, a secure application, PuTTY for example, can be run to communicate with the server.



Figure 1-68: Connection Complete

12. Repeat all steps in Section 1.18.6 using the appropriate parameters for the server.
13. On your desktop, right-click the **Dial-up Connection** icon located in the Notification area task bar (lower right corner of the screen).
14. Select the **Disconnect** option.
15. Repeat step 3 through step 14 for each of the back-up servers.
16. Verify that the LAN icon displays in the Notification area task bar.
 - a. Sequentially click **Start >> Control Panel**.
 - b. Select **Network Connections**.
 - c. Right click on **Local Area Connections**.
 - d. Left click on **Enable**.
17. Close the PuTTYgen application.
18. Close the *Command Prompt* window by typing **exit**.

1.18.8 Changing an RRS User Password on the LDAD Server

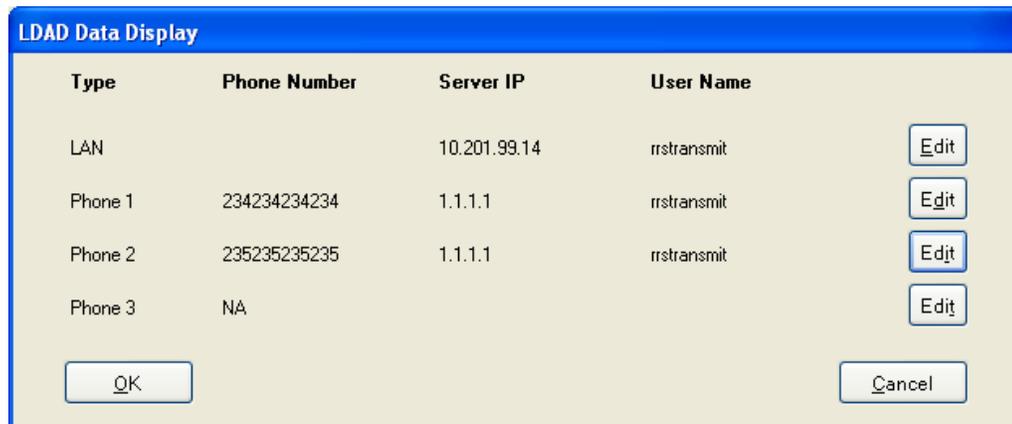
The Site AWIPS Systems Administrator (AWIPS SA) is the only one who can change the password on the local LDAD server. The SA can use **UNIX** commands or **sam** commands to change RRS User passwords. See AWIPS RWS-LDAD System Administration Note 15 (RWS-LDAD Interface Activation Instructions), Section 3 for changing LDAD passwords.

1.19 LDAD Information – RWS Communication/Password Options

This information is required to set-up communications passwords on the RWS Workstation to ensure coded messages are transmitted. The communication parameters allow the site to send the messages via the LAN or phone lines. See AWIPS RWS-LDAD System Administration Note 15 for additional information.

NOTE: The RWS Application software must be in the Offline Mode. Go directly to **Enter Offline Mode**. View Station Data.

1. Click the **LDAD Info** button at the bottom of the station data screen (see Figure 1-15) to see the communication options available (Figure 1-69). This window shows the LAN and multiple phone line options available.

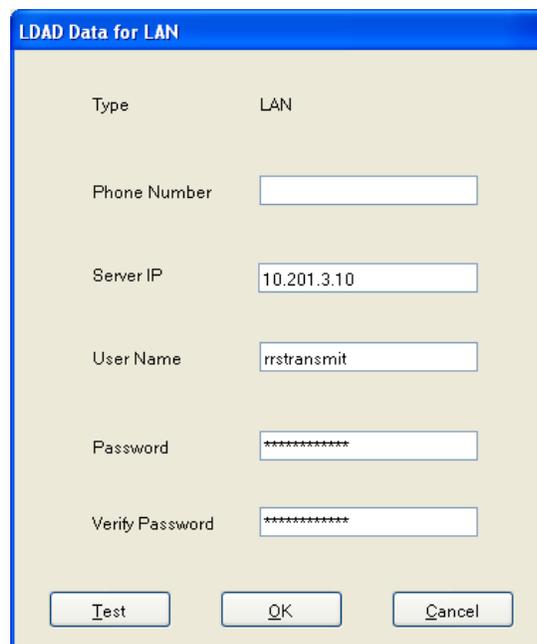


Type	Phone Number	Server IP	User Name	
LAN		10.201.99.14	rrstransmit	<input type="button" value="Edit"/>
Phone 1	234234234234	1.1.1.1	rrstransmit	<input type="button" value="Edit"/>
Phone 2	235235235235	1.1.1.1	rrstransmit	<input type="button" value="Edit"/>
Phone 3	NA			<input type="button" value="Edit"/>

At the bottom of the window are two buttons: on the left and on the right.

Figure 1-69: LAN and Phone Line Options (Example)

2. Select the type of communication line to edit. Select the **Edit** button. The following windows appear if the **LAN** or a **Phone line** option is selected. The Site Manager or RWSSM must set this information. The RRS User Name and Password must match the RRS User Name and Password on the applicable LDAD for:
3. THE LAN communications to local LDAD (Figure 1-70) (A password for the LAN is not required).



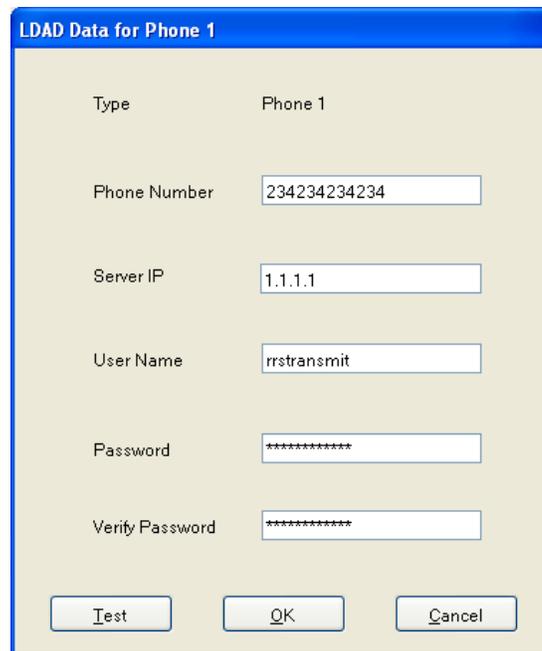
The window is titled "LDAD Data for LAN" and contains the following fields:

- Type: LAN
- Phone Number:
- Server IP:
- User Name:
- Password:
- Verify Password:

At the bottom are three buttons: , , and .

Figure 1-70: LAN Entries (Example)

4. The primary, secondary, and tertiary modem/phone (1) communications to regional LDAD (Figure 1-71).



Type	Phone 1
Phone Number	234234234234
Server IP	1.1.1.1
User Name	rrstransmit
Password	*****
Verify Password	*****

Test OK Cancel

Figure 1-71: Phone Entries (Example)

1.20 RWS Application Software System Administration Password Guidelines

Passwords must be created consistent with the following criteria:

1. Passwords must have at least twelve (12) non-blank characters.
2. At least one of the characters must be from the alphabet (upper or lower case).
3. At least one of the characters must be a number (0-9) or a special character (e.g., ~, !, \$, %, ^, and *).
4. Six of the characters may only occur once in the password (e.g., 'AAAAAA' is not acceptable, but 'A%mp2g3' and 'A%ArmA2g3' are acceptable).
5. Passwords must not include any of following: vendor/manufacturer default passwords: names (e.g., system user names, family names), words found in dictionaries (i.e., words from any dictionary, spelled forward or backward), addresses or birthdays, or common character sequences (e.g., 3456, ghijk, 2468).
6. Vendor-supplied default passwords, such as System, Password, Default, USER, Demo, and TEST, must be replaced immediately upon implementation of a new system.
7. Systems or applications that have multiple passwords for different levels of access or authentication must have unique passwords for each level.
8. Passwords must be protected to prevent unauthorized use. Specifically:
 - a. Passwords must not be shared except in emergency circumstances or when there is an overriding operational necessity as documented in an operating unit System Security Plan. Once shared, passwords must be changed as soon as possible.
 - b. Group passwords (i.e., a single password used by a group of users) must not be used without some other mechanism that can assure accountability (such as separate and unique network User ID's).

- c. Group passwords must not be shared outside the group of authorized users and must be changed when any individual in the group is no longer authorized. Group passwords must never be re-used.
 - d. Passwords that need to be shared because of an overriding operational necessity, as well as group passwords, cannot be used to control access to other IT systems or applications on IT systems.
 - e. Passwords in readable form (e.g., written on paper) must be kept in a safe location and not stored in a location accessible to others. For example, safe locations include storage in a locked container accessible only by the user.
 - f. IT systems and the Workstation must not display or print passwords as they are entered.
 - g. User applications must not be enabled to retain passwords for subsequent re-use, or be configured to bypass authentication mechanisms. For example, Internet browsers must not be enabled to save passwords for re-use.
 - h. Passwords must not be distributed through non-encrypted electronic mail, voice-mail, or left on answering machines.
9. Passwords must be changed as follows:
- At least every 60 days.
 - Immediately if discovered to be compromised or one suspects a password has been compromised.
 - Immediately if discovered to be in non-compliance with this policy.
 - On direction from management.
10. Do not reuse a password you have used the last 24 times you have changed your password, or more recently than 2 years from when you last used the password.
11. Access to password files or password databases must be restricted to only those who are authorized to manage the IT system.
12. If a determination is made that a password has been compromised or is not in compliance with this policy, and if the password is not immediately changed, the account must be temporarily suspended until the password is changed.
13. Passwords for servers, mainframes, telecommunications devices (such as routers and switches), and devices used for IT security functions (such as firewalls, intrusion detection, and audit logging) must be encrypted when stored electronically.
14. Passwords, other than single-use (one-time) passwords, must be encrypted when transmitted across a wide area network or the Internet.

1.21 Non-NOAAnet Operating System Installations

1.21.1 Set Security Policies for Non-NOAAnet Workstations

To set the Federal Desktop Core Configuration (FDCC) policies, follow these steps:

1. Log onto the workstation using an administrative account.
2. Insert the RWS Application Software CD into the workstation.
3. Cancel the RWS installation program.
4. Browse to the CD drive and open the FDCC directory.
 - a. Copy the FDCC folder from the CD to the C:\ directory.
 - b. Navigate to the C:\FDCC directory.
5. Double-click the **install_ie7.bat** file and wait until prompt indicates the program has finish running.
6. Double-click the **install_Security.bat** file and wait until prompt indicates the program has finished running.
7. If an error is displayed during the step 5 or 6, Double-click the **reset_xp.bat** file and wait until prompt indicates the program has finish running.

1.21.2 Initial Installation - Windows Security for Non-NOAAnet installations Only

To install Microsoft Windows security to support the RRS Operating System 1.09 (or later) version software on a non-NOAAnet Workstation, perform the following procedures (This section applies only to non-NOAAnet installations):

1. Turn on computer, if not on: Select **Restart** from the menu and click **OK**.
2. Log onto the Workstation using the default Administrator account.
3. For Automatic Updates, perform the following steps:
 - a. Wait several minutes for the Windows Update Notification Shield icon to appear (lower right corner of Screen or System Tray).
 - b. Click on yellow **Window Security Update Shield**.
 - c. The *Automatic Updates* screen appears (Figure 1-72).
 - d. Select **Express Install** radio button for high-priority updates. The computer will automatically check for available security updates that have not been made to your computer.
 - e. Click **Install**.
 - f. An update screen displays to indicate if updates are needed. If more current updates are available, the *Install Updates (x)* button will be live with the number (x) of updates available and needed for your computer. To install all updates, select **Install Updates (x)**.

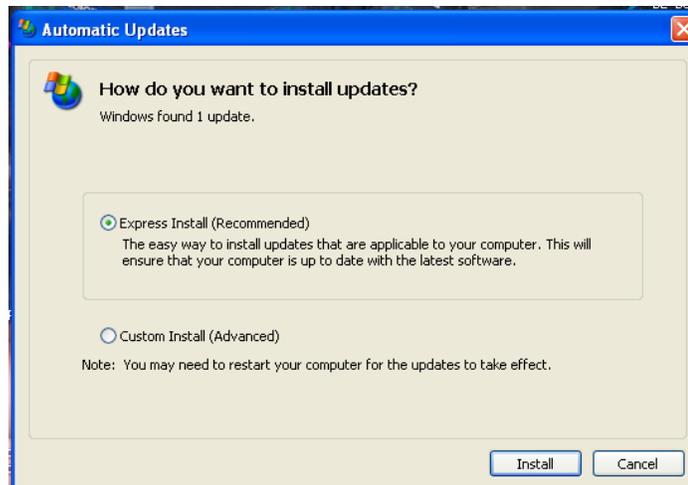


Figure 1-72: Express Install Screen

4. If the Automatic Update does not work, perform the following procedures:
 - a. Click the **Windows Start** button, select **All Programs**, and then **Windows Update**.
 - b. The *Microsoft Security Warning Update* Screen appears (Figure 1-73). Select **Install**.



Figure 1-73: Microsoft Security Update Screen

5. After Security Update installation, Click **OK** to restart Workstation, if needed. If restart is not required, close the update screen.

1.21.3 Manual Update - Optional Microsoft Windows Security Update

Routinely (monthly) check to see if the workstation has automatically received the latest security updates from Microsoft. If not current, perform a manual update procedure.

1. Click the Windows **Start** button. Select **All Programs** and **Windows Update**.
2. In Internet Explorer, click **Express** for high priority updates. The computer will check for available security updates that have not been made to the computer. An update screen will indicate if updates are needed. If none are needed, proceed to Step 12.
3. To install updates, click **Download** and **Install Now**. Once the updates are complete, click **Close**. (This will install the Windows Genuine Advantage Validation Tool, if necessary.)
4. Click **Continue** on the *Review your installation results* window.
5. When a list of high priority updates displays, click **Install Updates**.

6. In the EULA agreement window, click **I Accept**. The updates will install.
7. When the updates are complete, click **Install** for the Internet Explorer upgrade.
8. Click **I Accept** in the *agreement* window.
9. When prompted to authenticate Windows, click **Validate**.
10. Click **Next** in the following window.
11. After the installation is complete, click **Restart Now** to restart the Workstation, if needed. If restarting is not required, close the update screen.
12. Close all open windows.

1.21.4 Manual Update - Optional McAfee Virus Security Update

Routinely (monthly) check to see if the workstation has automatically received the latest security updates from McAfee. If not current, perform a manual update procedure.

1. Right-click the **McAfee shield** at the bottom of the screen.
2. Select **Update Now** (update in progress). If an error appears, click **Update Now** a second or third time until it disappears.
3. Click the **Close** button when complete.
4. Reboot the computer if prompted to do so.

1.21.5 Create New User Accounts in Windows for Non-NOAA net installations Only

The following procedures create additional users through the Windows Administrative Utility. The specific site manager responsible for RWS software management must create a unique user account for each user. Generic (account not named as a specific person) user accounts are not authorized.

1.21.5.1 RWS Site Administrator User Account Creation

Create a new user account in Windows for the RWS Site Administrator by performing the following steps:

1. From Windows XP, sequentially click **Start >> Control Panel >> Switch to Classic View** (if necessary) >> **Administrative Tools** (Figure 1-74).



Figure 1-74: Classic View Menu

2. Double-click the **Computer Management** icon.
3. Double-click **Local Users and Groups** directory. Right click **Users** then select **New User**.
4. Enter **User name:** (User name of RWS Site Administrator, i.e. John Doe).
5. Enter **Full name:** **JOHN DOE** (All Caps).
6. Enter **Description:** **RWS Site Administrator**.
7. Password: Enter a password that complies with the direction contained in Section 1.20.
8. Confirm password.
9. Deselect the box labeled **User Must Change Password at the next logon**.
10. Click **Create**.

1.21.5.2 Observer User Account Creation

Create an additional user account for Observer by performing the following steps:

1. Enter **User name:** (User name).
2. Enter **Full name:** **First Name Last Name**.
3. Enter **Description:** **RWS Observer**.
4. Password: Enter a password that complies with the direction contained in Section 1.20.
5. Confirm password.
6. Deselect the box **User Must Change Password at the next logon**.
7. Click **Create**.

1.21.5.3 Trainee User Account Creation

Create an additional user account for Trainee by performing the following steps:

1. Enter **User name:** (User name).
2. Enter **Full name:** **First Name Last Name**.
3. Enter **Description:** **RWS Trainee**.
4. Password: Enter a password that complies with the direction contained in Section 1.20.
5. Confirm password.
6. Deselect the box **User Must Change Password at the next logon**.
7. Click **Create**.

1.21.5.4 Completing Creation of New User Accounts

For the RWS Site administrator account complete the following steps:

1. Close *New User* window.
2. Click **Users**.
3. Right click on **RWS Administrator** or **RWS Site Administrator account:** (User name)/John.Doe.

4. Select **Properties**.
5. Click **Member of** tab.
6. Click **Add** button.
7. Type **Administrators** (Windows Group) in the text box for object names and click **OK**.
8. Click **OK**.
9. Close any remaining open windows.

NOTE: This completes the Non-NOAAnet Operating System (OS) installation. Return to Section 1.6 for RWS Operational Build 2.0 Application Software Installation.

1.22 RWS BIOS Update Procedure

The BIOS for the Gateway E6300 RRS Workstation computer were installed by the NWS Depot (NRC) as a part of the hardware configuration process. Operating sites should never need to install or change the BIOS. Therefore, if there is a problem with the BIOS, sites should requisition a replacement computer (J700-2A3A1) from NLSC and return the failed computer to NRC for repair.

BIOS do not need to be re-installed, modified, or changed when re-ghosting or updating RWS operating software.

NOTE: This Section on BIOS installation is for information purposes only.

1.22.1 BIOS Update Software Download/Unzip Procedure from Web Site

The RWS Computer BIOS Update Software and most other RRS software/firmware is available on the OPS1 site as a zipped file that needs to be downloaded to your computer and unzipped. This site also includes software installation notes in PDF format ready for download. The following procedures are to be used to perform the software download function:

1. Under RRS Workstation (RWS) Software Versions, left click on **selected .zip file**, and select **Save**.
2. The *Save As* screen will appear and indicate the file will be saved to the Desktop. Click **Save**. A display screen will appear to indicate Download Complete.
3. After Save, unzip and store it on the Desktop under *RWS BIOS*.
4. Close the *OPS1* screen.

1.22.2 RWS BIOS Update Software Upload Procedures

NOTE: See RRS Software Notes for the most recent BIOS update procedures. Once downloaded and unzipped, the BIOS can be uploaded into the appropriate RWS Gateway E6300 computer.

1. Log onto the RWS (Windows) operating system as a user with Administrative Privileges.
2. Close all running applications such as the RWS application.
3. Select **RWS BIOS** icon on the Desktop. Double click on the file labeled **.exe**.

4. The Intel Express BIOS Update starts. In the *Welcome to InstallShield Wizard for Intel[R] Express BIOS Update* dialog box, click **Next >**.

NOTE: If instead of the update starting as in step 4, this error displays: *Error installing iKernel.exe: (0xa00)*, then you did not log onto the RWS (Windows) operating system as a user with Administrative Privileges per Step 1.

5. The License Agreement dialog box appears. Click **Yes**. The *Install Wizard Complete* dialog box appears.

NOTE: If instead a message box displays stating: *The BIOS version that you are installing is (either the same as or older) than your system's current BIOS. Do you want to continue?*, click **No**. Do not continue; you should not be running this procedure. Exit by clicking **OK** in the next message box.

6. Read the WARNING in this box and then click **Finish**. Please keep HANDS OFF the keyboard and mouse until presented with the Windows logon screen described in Step 7. During the two reboots described in Step 7, the E6300 Computer will pause an unusually long time on the system boot-up screen (the screen with the large green colored Gateway text across it). Be patient!
7. The E6300 Computer shuts down Windows (without operator intervention) and reboots to a black screen with yellow text, beginning with the text: *Flashing motherboard firmware:*. The update process runs to completion and then the E6300 Computer again reboots (all without operator intervention) to the Windows logon screen. Logon as the same user that you logged on as in Step 1. You should immediately get a dialog box stating: *The Express BIOS update has completed successfully.*
8. Click **OK**. Delete the **icon** and the **.exe** file from the Desktop.
9. Perform a Windows Shut Down on the E6300 Computer. Then perform all steps of the BIOS Setting Procedure.

NOTE: The BIOS update **IS NOT** complete until you perform the separate BIOS Setting Procedure - RWS Gateway E6300 Computer described in Section 1.22.3. This is necessary to ensure that options added or modified by the update are adjusted to their new Setup Defaults. Perform the BIOS Setting Procedure even though it seems as though all you are doing is setting the BIOS to the Setup Defaults and then back to the way it was already set for RWS.

1.22.3 BIOS Setting Procedure - RWS Gateway E6300 Computer

This procedure sets the RRS computer's BIOS as required by the RWS application program software for the Gateway E6300 computers. The National Reconditioning Center (NRC) normally performs this procedure on RRS computers prior to initial or replacement issue. This procedure is provided to field sites for use to verify settings on a failed RRS computer before returning it to NRC for replacement. This procedure can also be used by the field to return the settings to the authorized configuration if the current configuration is in doubt. This procedure will also be used, along with additional instructions, if it becomes necessary for field sites to update their BIOS version level.

The method used to set the RRS computer's BIOS (also referred to as the CMOS memory settings) is to set the BIOS to its built-in Setup Defaults, and then change only those few settings that differ from those defaults. There is no reason to check each setting. Use the following procedure to ensure that the BIOS is set as required by the RWS application program software.

1. To access *System Setup*, power up the RRS computer and immediately begin repeatedly pressing the **F2** function key until the *System Setup* screen appears. Do not wait for the processor boot screen (the screen with the large green Gateway logo) to press **F2**, because by the time you see the screen, it may be too late. If the system begins booting the hard drive, you were not quick or persistent enough with the F2 key. Reboot the computer and try again. At times, the processor boot screen may disappear and reappear again. If this happens, continue repeatedly pressing the **F2** function key. The *System Setup Main* screen appears with *Main* highlighted on the top blue colored selection bar.
2. Without changing any screens or highlighting, load the Setup Defaults by pressing the **F9** function key. A Load Defaults? (Y/N) question box appears. Answer Yes by pressing the **Y** key.
3. On the same *System Setup Main* screen, use the up/down arrow keys to highlight the **<Enable>** selection of Hyper Threading Technology, if it is not already highlighted. Then press **Enter**. A *Disable/Enable* selection box appears. Use the up/down arrow keys to highlight **Disable**, then press **Enter**. *Hyper Threading Technology* should now show **<Disable>**.
4. On the same *System Setup Main* screen, use the up/down arrow keys to highlight the **[MM/DD/YYYY]** selection of *System Date*. Using the **Tab** key to move between MM/DD/YYYY, enter the current UTC date.

NOTE: If you are unsure of the UTC time and date, use another computer to access <http://www.time.gov> and select UTC at the bottom of the web page's screen.

5. On the same *System Setup Main* screen, use the up/down arrow keys to highlight the **[HH:MM:SS]** selection of *System Time*. Using the **Tab** key to move between HH:MM:SS, enter the current **UTC time** in 24 hour format. Ensure that you have set the current UTC time and date, NOT your local time and date.
6. On the same *System Setup Main* screen, verify the three settings that you have changed now show as follows:
 - Hyper Threading Technology <Disable>
 - System Date [MM/DD/YYYY] Current UTC date.
 - System Time [HH:MM:SS] Current UTC time, 24 hour format.
7. Select the **Boot** screen by using the Left/Right Arrow keys to highlight **Boot** on the top blue colored selection bar. Using the Up/Down Arrow keys, highlight the **<Enable>** selection of *Boot to Network*, then press the **Enter** key. A *Disable/Enable* selection box appears. Use the **Up/Down Arrow keys** to highlight **Disable**, then press the **Enter** key. *Boot to Network* should now show **<Disable>**.
8. On the same *Boot* screen, use the Up/Down Arrow keys to highlight the **<Enable>** selection of *USB Boot*, then press the **Enter** key. A *Disable/Enable* selection box appears. Use the Up/Down Arrow keys to highlight **Disable**, then press the **Enter** key. *USB Boot* should now show **<Disable>**.

9. On the same *Boot* screen, verify the two settings that you have changed are now show as follows:
 - Boot to Network <Disable>
 - USB Boot <Disable>
10. Without changing any screens or highlighting, Save and Exit by pressing the **F10** function key. An *Exit Saving Changes? (Y/N)* question box appears. Answer Yes by pressing the **Y** key. The computer reboots. You are finished, except to verify that new settings have been saved.
11. To verify the new settings, double check your changes. Repeat Step 1. Using the Arrow keys, navigate as described in the previous steps to check that the locations you changed are still set as listed in steps 6 and 9.
12. Once the settings have been re-verified, exit this time by pressing the **Esc** key . An *Exit Setup? (Y/N)* question box appears. Answer Yes by pressing the **Y** key.

You are finished with BIOS. The computer will reboot to the RWS application program. No changes are necessary to the RWS application program due to performing this BIOS procedure.

1.23 RRS Workstation Start-Up

1. Turn on the RRS Workstation and log in using your assigned Username and Password.
2. Double click the RWS.NET Desktop icon, Figure 1-75



Figure 1-75: RWS Desktop Icon

3. The **RWS** window (Figure 1-76) will appear with the **Security Warning** message. Read the message and click the **OK** button.

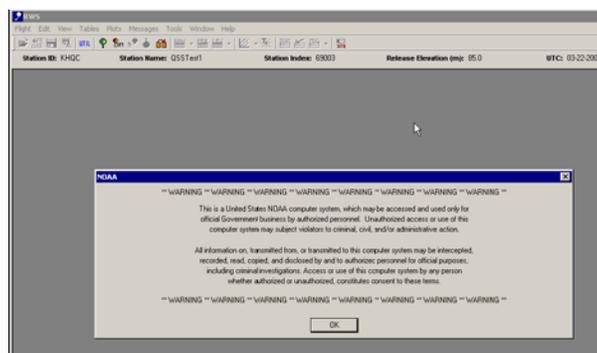


Figure 1-76: RWS Window with Security Warning

4. The **Flight Options** window (Figure 1-77) appears. Select **Run a live flight**.

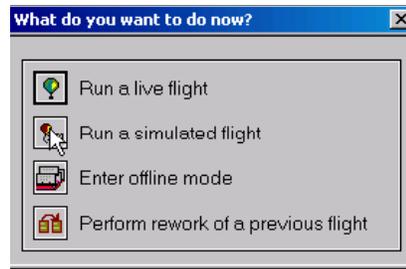


Figure 1-77: Flight Option Window

5. Click **Yes** in the prompt to power on the UPS.
6. The **RWS (Preflight)** screen and **Hardware Status** screen will appear (Figure 1-78)

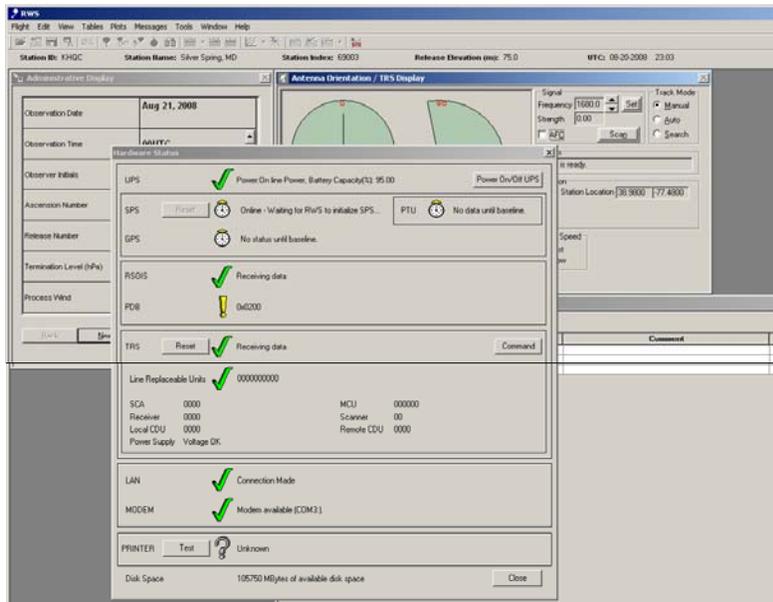


Figure 1-78: RWS (Preflight) Screen

CHAPTER 2 - TRS SYSTEM ADMINISTRATION

The TRS is a system to receive and track radiosondes. The TRS uses RDF radiotheodolite technology for tracking and GPS technology for wind finding. By combining the two methodologies, TRS achieves the highest possible range of signal reception and accuracy of wind finding. The TRS output signal is processed by a Signal Processing System (SPS) that is compatible with the model of the radiosonde being used. The PTU, and the radiosonde's GPS coordinates are passed on to the Signal Processing System (SPS) where differential correction is applied. This information is then sent by the TRS DCE to the RRS Workstation where wind speed and direction are calculated to generate standard meteorological messages. A two-meter parabolic dish is mounted on a movable frame that allows for independent azimuth and elevation movements. A scanning antenna mounted at the focus of the parabolic dish receives and samples the incoming RF signal by electronically switching between four helical elements to provide signals to command the azimuth and elevation servomotors to move the antenna.

2.1 TRS Firmware

The Telemetry Receiver System (TRS) Firmware is updated and compiled into a HEX file by the vendor. Each site is responsible for determining the current version and, if necessary, uploading the latest firmware versions onto the respective TRS subsystem via a serial interface using the Offline Maintenance Suite (OMS).

2.1.1 TRS Firmware Hardware Requirements

Firmware versions for each of the following TRS subsystems are required to be implemented:

- Control Display Unit (CDU) firmware. This firmware is the same for the Local CDU (LCDU) in the TRS radome, and the Remote CDU (RCDU) at the launch area. The selection of the CDU on the TRS Advanced Operations screen directs the upload to the failed CDU. When uploading a new version, the firmware must be sent to both the LCDU and RCDU in separate commands.
- Motion Control Unit (MCU).
- Receiver (Rcvr).
- System Communication Assembly (SCA).
- Scanning Antenna Assembly (SAA). This firmware is **not** provided. This firmware is currently hard coded on the SAA board and any subsequent change will be installed by the National Reconditioning Center (NRC) or vendor.

2.1.2 Obtain Existing Firmware Version Data

Before starting the upload procedures for a new firmware version, it is useful to obtain the existing version number and software load information currently on the TRS hardware.

1. The TRS must be ON and the TRS Advanced Operations screen (Figure 2-6) within OMS OBIT must be opened to request a firmware version.

2. The required command details for requesting the firmware version information for a subsystem (x) are listed in Table 2-1. Enter the following command to check (C) the firmware (F) version (V):

Command: /Cx F ?cc<CR>

3. A reply to the command should be returned within 1 second or a timeout will occur.

Example Reply: Cx F =Vd.ddx<CR>

Table 2-1: Firmware (F) Version (V) Command

Field	Definition
x	Subsystem identifier:
c	System Communications Assembly (SCA) Microcontroller
m	Motion Control Unit (MCU) Microcontroller
1	Local Control Display Unit (LCDU) Microcontroller
2	Remote Control & Display Unit (RCDU) Microcontroller
r	Receiver (Rcvr)
s	Scanner (SAA)
cc	The ASCII representation of the hexadecimal value of a single-byte XOR-checksum of all the preceding characters

4. The Example Reply, Cx F =Vd.ddx<CR> returns a single line of firmware (F) version (V) data as shown in Table 2-2.

Table 2-2: Firmware (F) Version (V) Reply

Field	Definition
Cx	Subsystem identifier (see Table 2-1 for details of the value of x)
F=Vd.ddx	The firmware version information, d.dd is the numeric version, and x is the optional letter indicating a sub-version (or a space).
cc	The ASCII representation of the hexadecimal value of a single-byte XOR-checksum of all the preceding characters.

5. Special procedures are required to request SCA firmware. To request a firmware version for the SCA, perform the following steps:
 - a. Type /CCF? in the TRS Advanced Operations screen, **Text commands** box.
 - b. Click **Send**. Response is shown in Figure 2-1.

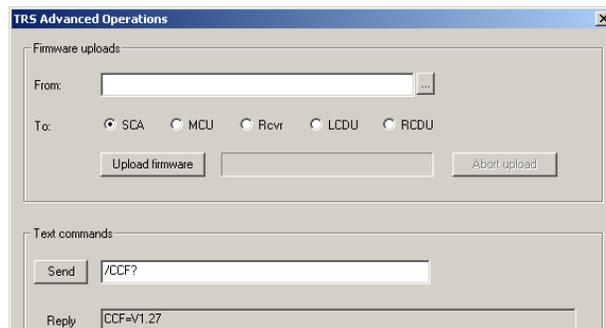


Figure 2-1: SCA Firmware version reply

2.1.3 Soft Reset System or Subsystem

Command: `/I x cc<CR>`

1. Requests the initialization (*I*) (soft reset) of the indicated subsystem (*x*) (required for new LRUs or entire system). The command details are listed in Table 2-3.

Table 2-3: Soft Reset Command

Field	Definition
<i>x</i>	Subsystem identifier, as indicated in Table 2-1.
<i>cc</i>	The ASCII representation of the hexadecimal value of a single-byte XOR-checksum of all the preceding characters

2. A timeout on the reply to this command will occur in 1 second.

Reply: `OKcc<CR>`

3. The above reply is returned if the command was successfully received and execution has begun. Reset the SCA using the following command line:

Type `/IC <Enter>` to initialize (*I*) a subsystem in the TRS Advanced Operations screen (Text commands Send Box).

4. During the initialization phase, each TRS subsystem is marked with a communications error status bit. Once the subsystem has completed initialization, this bit is cleared, indicating that the subsystem has come back on-line. Notice that a soft reset will not restore full functionality to the MCU. Further initialization instructions from the SCA, i.e., motor warm-up and axis index location must occur before the MCU becomes fully functional for use.
5. The final MCU initialization stages can be tracked through the `/DT` response, *Tx* field. As program progress continues from $x = w$, warm-up, if needed, to $x = l$, axis initialization to $x = m$, antenna manual control. Similarly bit 3 should eventually clear and can be verified by reading the *Shh* field.
6. The time required to accomplish the soft resets are a variable. Other than the motor warm-up time, the maximum time required for a complete soft reset of the entire system is less than 3 minutes. At the extreme cold temperature limit, the heating of the motors will require less than 20 minutes from application of power. The `/DT` response should be polled to determine system progression and availability. The functional operations resulting from a soft reset are shown in Table 2-4, Soft Reset Operations

Table 2-4 Soft Reset Operations

Sub System	Name	Description
c	System Communications Assembly (SCA)	Restarts the SCA. Performs local POST. The TRS clock is reset to zero. The flight clock is reset to zero, and stopped. Gathers LRU status information. Requests MCU to perform warm-up and axis initializations. Analyses results and indicates availability of LRUs.
m	Motion Control Unit (MCU).	Restarts the MCU, aborting any current operations. Performs local POST. Restores volatile variables (positioning velocities and accelerations) to their system defaults (see appropriate entries below). No antenna movement is carried out (warm-up and axis initialization are not executed) and the station reverts to the manual antenna control mode.
1	Local Control Display Unit (LCDU)	Restarts the CDU. Performs local POST. All previous keyboard entered settings (e.g., volume level and display contrast) are maintained.
2	Remote Control & Display Unit (RCDU)	Restarts the CDU. Performs local POST. All previous keyboard entered settings (e.g., volume level and display contrast) are maintained.
r	Receiver (Rcvr)	Restarts the receiver, aborting any current operations. Performs local POST. Restores frequency to 1680.00MHz and frequency control to manual.
s	Scanner (SAA)	Restarts the scanner. Performs local POST.

2.1.4 How to Install the TRS Firmware

The TRS firmware updated version (HEX file) is compiled by a vendor and provided to the government. Sites will upload any new firmware onto the respective TRS subsystem via a serial interface. It is installed by using the Offline Built-In-Test (OBIT) TRS Advanced Operations Utility (see Section 2.1.8).

2.1.5 Initiate (I) Firmware Upgrade (U)

1. The Command: `/UxIcc<CR>` sets the station state where it will be ready to receive and process Intel Hex files for firmware upgrade (U) of the specified subsystem (x). The command details are given in Table 2-5.
2. A timeout on the reply to this command will occur in 5 seconds.

Reply: `OKcc<CR>`

3. The reply, `OKcc<CR>`, should occur if the command was successfully.

Table 2-5: Initiate (I) Firmware (F) Upgrade (U) Command

Field	Definition
x	Target subsystem to be upgraded:
c	System Communications Assembly Microcontroller
m	Motion Control Unit Microcontroller
r	Receiver Microcontroller
1	Local Control Display Unit Microcontroller
2	Remote Control & Display Unit Microcontroller
cc	The ASCII representation of the hexadecimal value of a single-byte XOR-checksum of all the preceding characters

2.1.6 Add Firmware Upgrade (U) Intel Hex (H) Line

Command: `/UxH:hhhhh.hhhhhcc<CR>`

1. The command: `/UxH:hhhhh.hhhhhcc<CR>` ends a single line of Intel Hex (H) format data to the station, for the upgrading of the firmware of the specified subsystem. The target subsystem is specified in x, (as indicated in Table 2-4) and should match that indicated in the Initiate Firmware Upgrade (U) command, detailed in [Section 3.7.1, NWS EHB 9-725](#). The characters: `hhhhh.hhhhh`, in the command denote an Intel Hex line, which may be variable in length but, with a maximum of 128 characters.
2. The Workstation should send all required Intel Hex line commands contiguously immediately following the Initiate Firmware Upgrade command (see Section 2.1.5). Any interspersed commands from the Workstation will abort the upgrade process.
3. A timeout on the reply to this command will occur in 5 seconds.

Reply: `OKcc<CR>`
 A Reply: `OKcc<CR>` will be returned if the command was successfully executed.
4. The Program (P) Firmware Upgrade (U) Command: `/UxPhhhhhhhcc<CR>` begins programming the received firmware upgrade into the specified subsystem. The target subsystem is specified in x (as indicated in Table 2-5), and should match that indicated in the Initiate Firmware Upgrade command and the Add Firmware Upgrade Inter Hex Line commands. `hhhhhhh` is the additive checksum of the ASCII value of each character (excluding non-printable characters) in the Intel Hex upgrade file.
5. The Workstation should send this command immediately following the last Add Firmware Upgrade Intel Hex Line command. Any interspersed commands from the Workstation will abort the upgrade process.
6. A timeout to this command will occur in 5 seconds.
7. The Reply: `OKcc<CR>`, occurs if the command is successfully received and programming has begun. `cc` is the ASCII representation of the hexadecimal value of a single-byte XOR-checksum of all the preceding characters. No further commands are serviced. The entire system performs a soft reset on completion of the programming of the firmware upgrade. The system should continue polling, as it did following the initial power-up, until it returns on-line. The firmware version of the upgraded subsystem can then be verified.

2.1.7 TRS Firmware Verification and Download Procedures

2.1.7.1 Firmware/Software Verification.

Use the OPS1 web page (<https://www.ops1.nws.noaa.gov>) to verify the firmware/software is the most current version. The current firmware/software versions are listed on the OPS1 site.

1. Open Internet Explorer and go to the OPS1 web page: <https://www.ops1.nws.noaa.gov/>.
2. Select **ART, RRS, RSOIS, Windprofiler**.
3. Sign in with your NOAA email username and password.
4. Select **What's New** and **RRS Software Status**. The current TRS Firmware versions available are listed.
5. Look under *Telemetry Receiver System (TRS) Baseline Firmware* to verify the firmware is the most current version.

2.1.7.2 TRS Firmware Download/Unzip Procedure from Web Site

The actual TRS firmware programs are available on the OPS1 Web site as a zipped file and may be downloaded and unzipped. Use the following procedures to perform the download/unzip functions:

1. Under Telemetry Receiver System (TRS) Baseline Firmware, left click the selected .zip file, and select **Save**.
2. The *Save As* screen will appear and indicate the file will be saved to the Desktop. Click **Save**. A display screen will appear to indicate *Download Complete*.
3. After *Save*, unzip the file and store it on the desktop.
4. Repeat above steps for additional files to download and unzip, as necessary.
5. Close the OPS1 screen.

2.1.8 TRS Firmware Upload Procedures Using OMS

Once downloaded and unzipped, these files can be uploaded from the RRS Workstation into the appropriate TRS equipment using RWS OMS (or a PC). Use the following sections for uploading TRS firmware:

1. Power **ON** the Workstation.
2. Log on to Microsoft Windows as **RWSSM**.

3. Double-click **RRS Offline Menu** Icon . The *Offline Maintenance Menu* screen (Figure 2-2) opens.



Figure 2-2: Offline Maintenance Menu

4. Click **UPS Maintenance**. The *UPS Control* screen (Figure 2-3) opens.

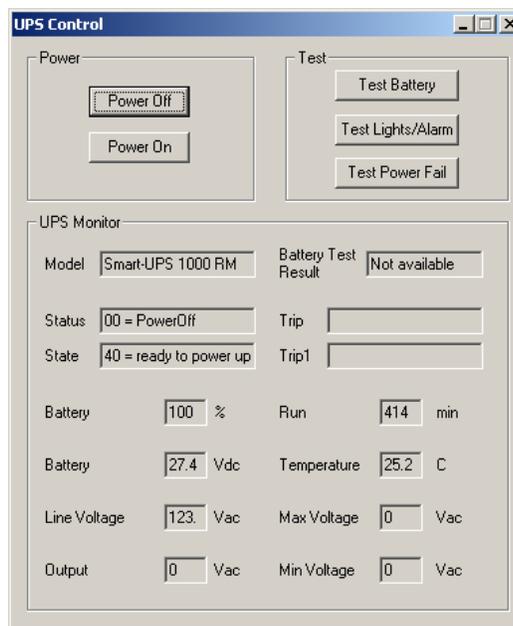


Figure 2-3: UPS Control Screen

- 5. If the UPS Power is OFF (see the Status field in Figure 2-3), click the **Power ON** button. The *Caution* screen (Figure 2-4) opens.

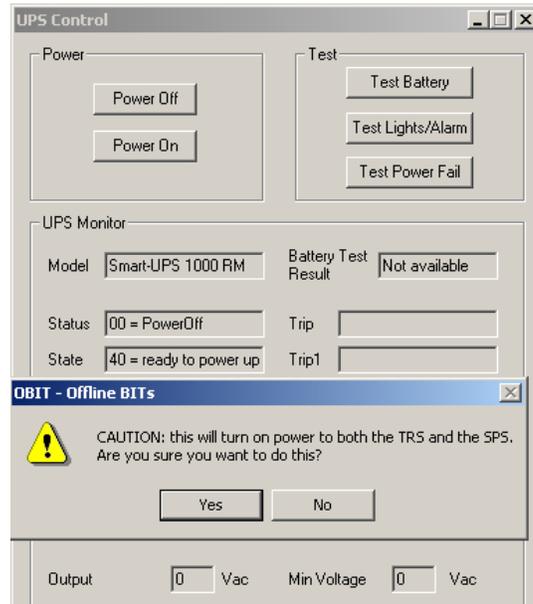


Figure 2-4: UPS Caution Screen

- 6. Click **Yes** to turn on power. Allow UPS to initialize.
- 7. Close the *UPS Control* menu. The *OBIT - Offline BITs* screen (Figure 2-5) opens.
- 8. Exit the *OBIT - Offline BITs* screen, and the *Offline Maintenance Menu* (Figure 2-2) appears.
- 9. Click the **TRS Maintenance** button. The *OBIT - Offline BITs* screen (see Figure 2-5) opens.

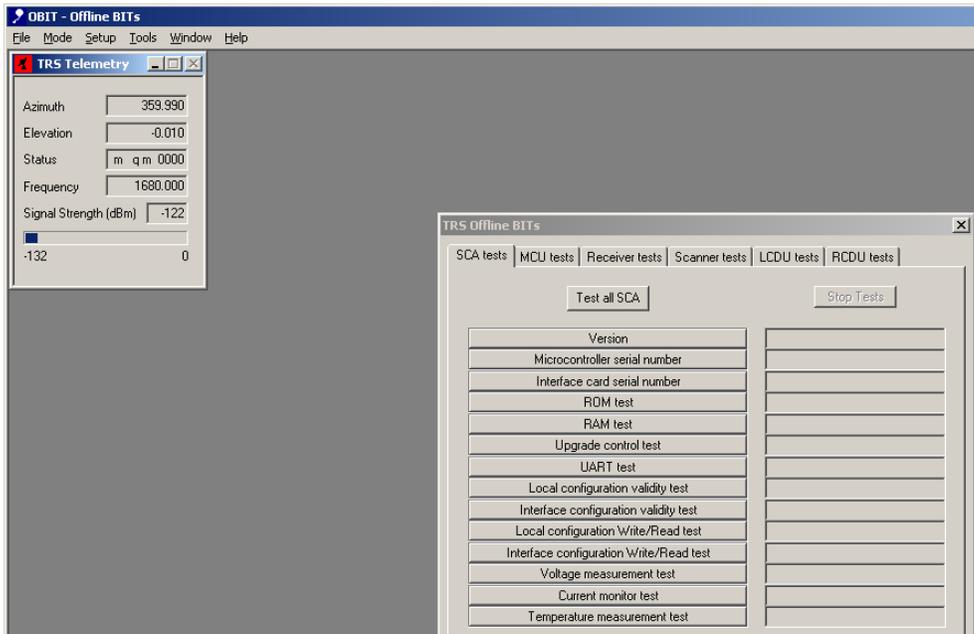


Figure 2-5: OBIT - Offline BITs Screen

10. Click **OBIT tools** (top of screen) menu, and select **TRS Advanced** option. The *TRS Advanced Operations* screen (Figure 2-6) opens.

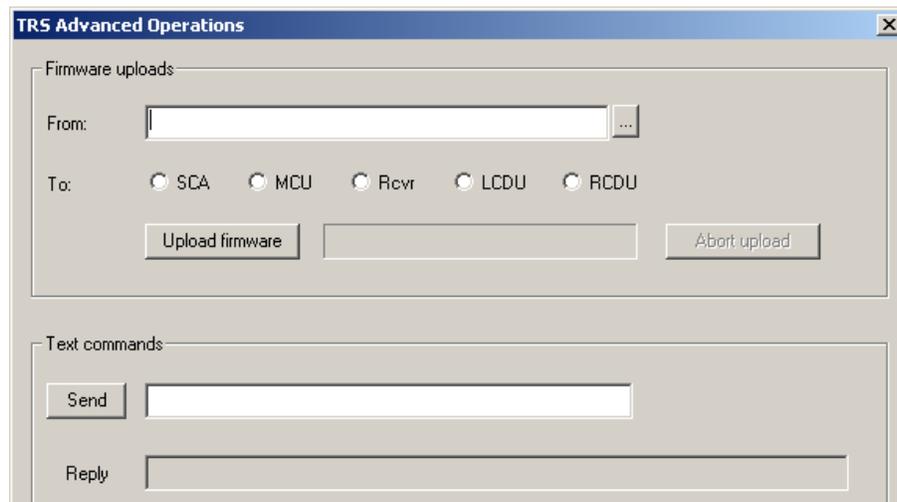


Figure 2-6: TRS Advanced Operations Screen

11. Changing firmware requires the specific TRS LRU processor to be in the test mode (tm). This is accomplished by the `/ixtm=1` command, where the x identifies the subsystem processor associated with the identifier (i) as listed in Table 2-6 (ictm=1 for the SCA, imtm=1 for the MCU, etc.)

Table 2-6: Subsystem Processor Identification

Identifier (i)	Definition
x	Subsystem identifier:
c	System Communications Assembly Microcontroller
m	Motion Control Unit Microcontroller
1	Local Control Display Unit Microcontroller
2	Launch Control Display Unit Microcontroller
r	Receiver Microcontroller
s*	Scanner Microcontroller
* The Scanner is hard coded, and any change requires a formal ECP. The field is not authorized to install scanner firmware.	

12. Click the **From** menu button. The *Insert disk* window (see Figure 2-7) opens the first time this procedure is done, and then the screen defaults to the *Open* menu.



Figure 2-7: Insert Disk Window

- 13. Insert the TRS firmware disk (if available). If a CD is used to upload firmware, skip to step 15.
- 14. If the Firmware Upload file is located at another source, click **Cancel** on the *Insert disk* screen and the *Open* menu (Figure 2-8) displays.

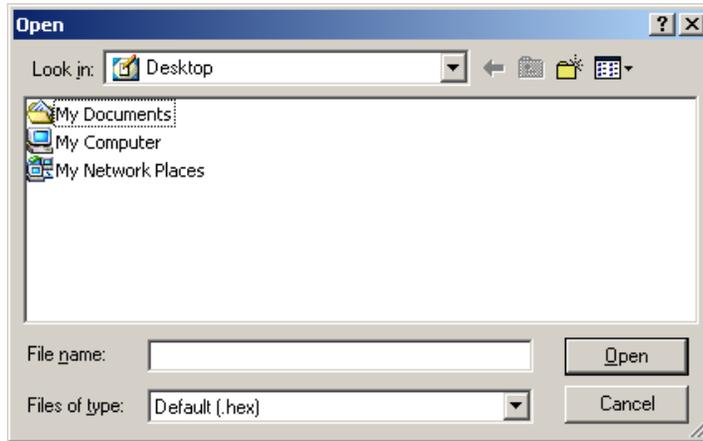


Figure 2-8: Open Screen

- 15. Select **File location** folder (where Firmware resides) from the desktop, “*Look In*” window menu.
- 16. Double-click the **Folder** containing latest version (LRU hex file extension).
- 17. Double-click **hex file extension**.
- 18. Select **Subsystem (LRU)** from *Firmware Upload* box. Figure 2-9 appears.
- 19. Click **OK**.

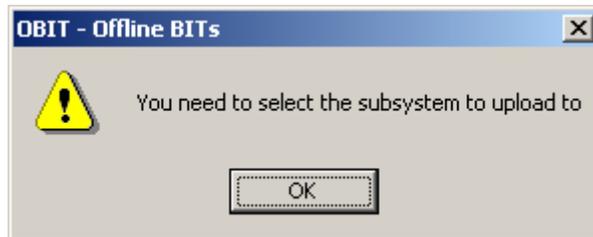


Figure 2-9: OBIT – Offline BITs, Select Subsystem Screen

- 20. Click the **Upload Firmware** button on the *TRS Advanced Operations* screen (see Figure 2-6).
- 21. Click **Yes** on the *OBIT - Offline Bits* confirm screen (see Figure 2-10).

NOTE: Confirm that the LRU Firmware requested in the TRS Advanced Operations menu is the same as the LRU Firmware in the *OBIT – Offline BITs* confirm screen.

CAUTION

Recheck the indicated file above for the subsystem that requires uploading. Damage to the requested LRU will result if the wrong LRU hex file is uploaded.

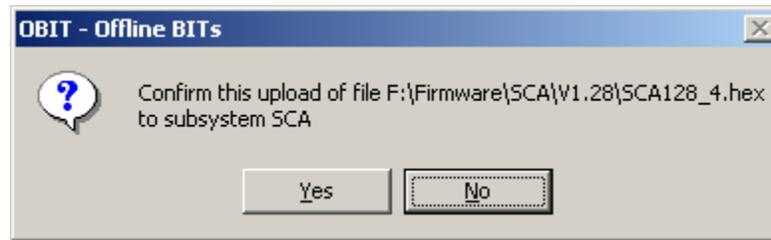


Figure 2-10: OBIT – Offline BITs Confirm Screen

22. Click **Yes** on the Obit - Offline BITs *Are You Sure* screen (Figure 2-11).

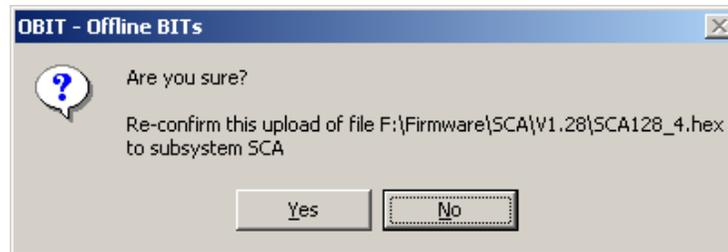


Figure 2-11: OBIT - Offline BITs Are You Sure Screen

23. Click **Yes** on the *OBIT - Offline BITs Last Chance* screen (Figure 2-12).

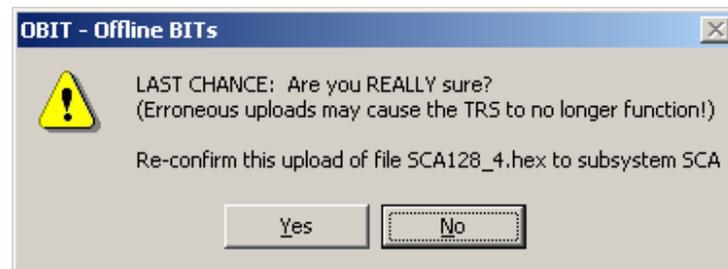


Figure 2-12: OBIT – Offline BITs LAST CHANCE Screen

24. Upload process begins (Figure 2-13).

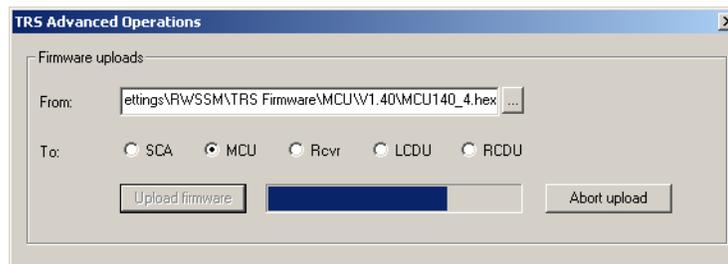


Figure 2-13: TRS Firmware Upload Process (Example)

NOTE: The upload process can be cancelled at any time prior to completion by clicking the **Abort Upload** button. If the Abort Upload button is activated at this time, the *Abort screen* will open (Figure 2-14).



Figure 2-14: Upload is Being Aborted

25. Upload will continue, if Abort Upload button is not activated, and the *Upload done* screen (Figure 2-15) appears. Click **OK** to initiate the installation of updated firmware.



Figure 2-15: Upload Done

26. Click **OK** on the Figure 2-16 screen if version is accurate.



Figure 2-16: Subsystem Version Reported

27. When complete, the *TRS Advanced Operations* menu opens. For each subsystem, repeat steps as necessary.
28. Finished. **Close** all OBIT screens.

2.2 TRS Coefficients

2.2.1 Site Specific Data

There is site-specific data stored in the TRS at the time of initial installation. These data consist of the information regarding the location of the TRS. The TRS stores this data in non-volatile memory for use every time it is powered up.

2.2.2 TRS Location

The TRS tracking latitude, longitude, and altitude are used by the GPS receiver to compute the required azimuth and elevation angles required to direct the antenna to point to a specific GPS satellite in space.

Use the OMS procedures in NWS EHB 9-710, [Section 2.5.1.1](#) to enter TRS location data.

2.2.3 Operational Data

Operational data consists of information required for the operation and performance of the TRS. Use the OMS procedures in NWS EHB 9-710, [Section 2.5.2](#) to enter TRS operational data.

2.2.4 Adjustable Factory Coefficients

Coefficients are factory set and not required to be validated in the field. They will, however, be measured and recorded during installation. Coefficients are listed in NWS EHB 9-710, [Table 2-6](#). Adjustable coefficients are marked with italics.

Enter adjustable coefficients into the TRS using the OMS. Entry procedures are found in NWS EHB 9-710, [Section 2.5.3](#).

2.3 Calibration

See Telemetry Receiver System, NWS EHB 9-710, [Section 2.5.4](#).

2.4 Off-Line Built-In-Test

See Telemetry Receiver System, NWS EHB 9-710, [Section 2.5.5](#).

CHAPTER 3 - SPS SYSTEM ADMINISTRATION

3.1 SPS Introduction

The Signal Processing System (SPS) provides baseband conversion of the modulation on the Intermediate Frequency (IF) input. This baseband data is provided to the processor within the SPS.

The GPS receiver provides the reference position and velocity data to the processor within the SPS. The processor within the SPS converts the radiosonde telemetry and differential GPS reference data into meteorological data and provides it to the RWS Application Software.

The SPS software runs on the Sippican RRS SPS and performs all functions required by the SPS including processing radiosonde data, controlling the GPS receiver, communicating with the RRS Workstation, and with the maintenance computer. The SPS Software Installation Diskette contains a file to be downloaded to the Sippican RRS SPS plus programs that run on the maintenance computer to perform the download.

The SPS software runs under the **DR-DOS** operating system on the solid state hard drive of the SPS. The primary program of the SPS software is the RRSSPS.EXE program which performs the serial I/O required for the radiosonde and local GPS receiver data collection, the RRS Workstation communications and the maintenance communications. It also performs the sensor based pressure, temperature, and humidity (PTU) calculations and wind smoothing. A separate program, GPSWIND.EXE, runs as a child process of the RRS SPS program, performing the GPS wind calculations. The GPS, height based, derived pressure is calculated by a third program, GPSPRESS.EXE, which also runs as a child process. These three programs communicate primarily by Expanded Memory Specification (EMS). Several other programs perform the necessary EMS allocation and clean up. SPS software download is performed by separate programs that recognize the download condition, receive the download and report the status of the software install.

The SPS software is coded in the C programming language and uses C compilers from Borland and Microsoft. It also includes serial communication and file transfer code from SysFire LLC.

3.1.1 SPS Hardware Requirements

To install the SPS and connect all of the interfaces to the SPS, please follow the instructions listed in NWS EHB 9-715, **Chapter 4**. This procedure assumes that the TRS antenna hardware, including the communications equipment, has been installed and checked out.

3.1.2 SPS Software Verification and Download Procedures

The SPS Operating Software is updated and compiled into a HEX file by the vendor. Each site is responsible for verifying the version and, if necessary, uploading the latest software versions onto the SPS.

3.1.3 SPS Software Verification

Use the OPS1 Web page (<https://www.ops1.nws.noaa.gov>) to verify that the SPS operating software is the most current version. The current software versions are listed on the OPS1 Web site.

1. Identify and record the operating software on the SPS assembly (see Section 3.3.2).
2. Open Internet Explorer and go to the OPS1 Web page: <https://www.ops1.nws.noaa.gov/>. for a listing of the current SPS operating software version.
3. Select **ART, RRS, RSOIS, Windprofiler**.

4. Sign in with your NOAA email username and password.
5. Select **What's New** and **RRS Software Status**. The current software versions are listed.
6. Look under *Sippican Signal Processing System (SPS) Software Versions* to verify that the SPS software is the most current version.

3.1.4 Firmware/Software Download/Unzip Procedure from Web Site

The actual SPS operating software is also available on the OPS1 site as a zipped file that, if necessary, needs to be downloaded to your computer and unzipped. Use the following procedures to perform the download/unzip functions:

1. Under *Sippican Signal Processing System (SPS) Software Versions*, left click the selected .zip file, and select Save.
2. The *Save As* screen will appear and indicates the file will be saved to the desktop. Click **Save**. A display screen will appear to indicate **Download Complete**.
3. After *Save*, unzip the file and store it on the desktop.
4. Copy the software from the RRS Workstation to a floppy drive, CD, or USB (external hard) drive.
5. Close the *OPS1* screen.
6. See the following section for software upload/installation.

3.2 SPS Operating Software - Installation and Setup

A personal computer (PC) running Windows 98 (or later) or DOS version 6.x is required to install the SPS software. This PC must have a serial port (with a 9-pin D-connector) configurable as COM1. Use the following instructions for installing the SPS software:

1. Go to the Radome.
2. Turn-off SPS (power switch on the back of the SPS assembly).
3. With the PC and SPS power turned off, disconnect the SPS-RWS Maintenance cable (J700-1A3A7-1W3-A) from the SPS.
4. Connect the PC serial port 1 to the maintenance port of the SPS Assembly using the SPS Maintenance PC serial cable (Sippican P/N: 9019-012 or ASN: J700-1A3A7-1W4).

NOTE: If Windows XP is installed on the PC, it will attempt to load drivers for new hardware identified, i.e. a second mouse. If allowed to load drivers it may significantly slow down the SPS software installation process.

5. Switch the *SPS Download Switch* to the **DOWNLOAD** position (the up position).
6. Turn on the PC and allow it to boot up.
7. Insert the floppy, CD, or USB drive into the PC.
8. Double click **My Computer** on the desktop. Double click on the drive with the updated folder.
9. Double click on the folder. Double click on **INSTALL.BAT** or **INSTALL** (if file extensions are hidden). Immediately after executing the **INSTALL.BAT** file, turn on the *SPS* (power switch on the back of the SPS assembly).

10. The download and installation of SPS operating software may take 30 minutes or longer to complete. Progress is reported on the PC by the following statements:

NOTE: Watch the progress screen closely as download nears completion. Items (3) and (4) flash by and the screen closes quickly.

(1) *File download in progress.*

(2) *Sending block # ___ bytes sent ___ of ___ error count: ___.*

(3) *File download successful.*

(4) *SPS Software Update Complete. Please reset SPS with download switch disabled.*

The error count indicates how many attempts to transfer a data block have failed. When a data block transfer fails, the block transfer is attempted again. There may be several errors and still have a successful download. More than 10 errors may indicate a download problem. You can continue, but you may want to stop the download and delete new drivers added by windows. If stopped, restart the installation process from step 9 above.

NOTE: If the progress screen closes, you can assume the SPS software was updated successfully, even if you missed the message that the Software Update was complete.

11. When *SPS Software Update Complete...* appears, turn off the SPS (power switch on the back of the SPS) and switch the *SPS Download* switch to the middle position.
12. Disconnect the SPS Maintenance PC Serial Cable (J700-1A3A7-1W4) from the SPS. Reconnect the SPS-RWS Maintenance cable (J700-1A3A7-1W3). Shut down the PC.
13. Turn the SPS back on (power switch in the back of the SPS).

3.3 SPS System Integration Checkout

Use the following procedures to verify the SPS software has been updated.

3.3.1 Verify PTU and Wind Data Availability

The test consists of the following (See RRS Users Manual):

1. If not already on, start the RWS software application and begin operations for live upper-air-sounding and power up the TRS by turning on the UPS via *RWS Hardware Status* screen.
2. Prepare a radiosonde in accordance with the step-by-step radiosonde preparation procedure, except do not connect it to a balloon.
3. Set the TRS frequency to the radiosonde frequency, and engage the *AFC* function.
4. Using the *TRS antenna controller*, slew the antenna to maximize the radiosonde signal. Engage the auto-tracking function.
5. Verify that the RWS communicates with the SPS and the TRS antenna, and the SPS is providing PTU and Winds data.

3.3.2 SPS Operating System Version and Software Verification

After data has been verified as available, terminate the RWS software application, and inspect the sps.log file on the RWS computer to verify that the SPS software is the latest version.

1. Use Windows Explorer and go to C:\RWS\RWS\LOGS and open **sps.log**.
2. Use **CTRL-F** to open the “*Find*” dialog box, and enter “SPS_SOFTWARE_REV:”, then press the **Find Next** button.
3. Confirm the software version is correct.

3.4 Delete SPS Files from RWS

Delete SPS folders from the RWS desktop.

This completes SPS operating software installation.

CHAPTER 4 - RSOIS SYSTEM ADMINISTRATION

4.1 RSOIS System Interfaces

The Radiosonde Surface Observing Instrumentation System (RSOIS) is configured to interface with, be controlled by, and display data on the RRS Workstation. An RS-232 maintenance interface in the Remote Processor Unit (RPU) connects to the maintenance technician's personal computer. Standard communication interface software is used to communicate with the system and to receive broadcasted data. The communication interface software can be any software independent of the operating system, and capable of receiving ASCII. Packages compatible with a DOS or Windows environment include: ProComm, HyperTerminal (included with Windows), and Reflections. Apple and UNIX-based systems can also receive ASCII text.

4.2 Terminal Communications and Displays

4.2.1 Terminal Communication Interface Software

Terminal communications with the RPU or Base Station via a computer require the installation and setup of terminal communication interface software such as HyperTerminal or ProComm.

1. To open and setup HyperTerminal, go to: Start; All programs; Accessories; Communications; and HyperTerminal.
2. In the *HyperTerminal* folder, double-click HyperTerminal to bring up *HyperTerminal*.
3. In *HyperTerminal*, under *Connection Description* (Figure 4-1), enter a name (example: RPU# 1727) and click OK.

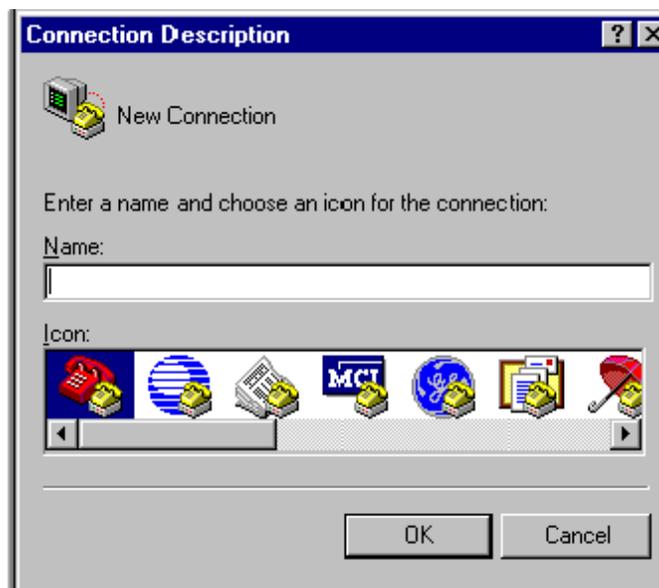


Figure 4-1: Connection Description Screen

- 4. In *Connect to* (Figure 4-2), select **COM1** from the *Connect To* screen using scroll-down menu and click **OK**.



Figure 4-2 Connect To Screen

- 5. Under *COM1 Properties* (Figure 4-3), set Port Settings as follow: Bits per second: **9600**, Data bits: **8**, Parity: **None**, Stop bit: **1**, and Flow control: **None**. Click **OK**.

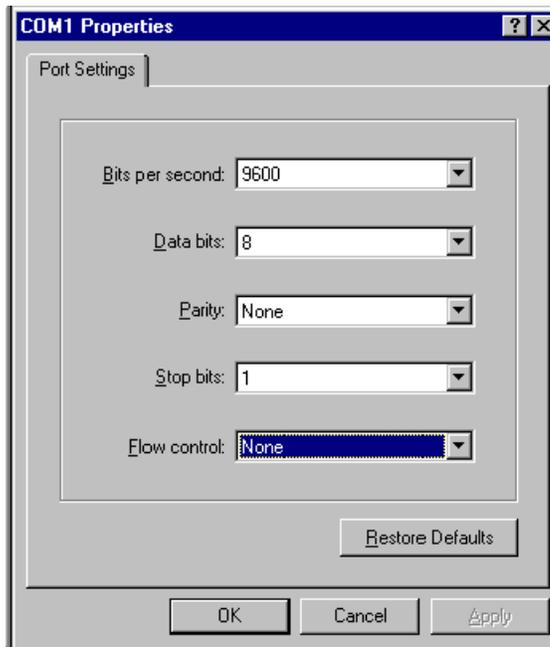


Figure 4-3: COM 1 Properties Screen

- 6. To install and setup ProComm. Obtain ProComm Version 4.7 (S100-TE318-2) from NLSC and follow the instructions in RSOIS Manual NWS EHB 9-201, Appendix D.

4.2.2 Terminal Communication Methods

Two-way communications with the RSOIS RPU can be established using any one of the following three ways:

- Connect the RS-232 technician's cable (supplied with the RPU) between the "COM3" port of the Zeno ® 3200 data logger and the serial port of a personal computer.
- Connect a fiber optic cable between the RPU fiber optic modem and the Workstation fiber optic modem, then using RS-232C, DB-9, DTE serial cable connected between Workstation modem and the serial port of the Workstation.
- Using the Base Station, connect the terminal cable (supplied with the Base Station) from the COM port of the Base Station to the serial port of the Workstation.

The use of one terminal communication method does not preclude the use of another at the same time. Thus, if a Workstation is receiving RPU data via fiber optic cable and a Base Station is subsequently powered up, both can simultaneously receive data from the RPU without any interference or interruption in data transmission.

4.2.3 Terminal Communication Interface Software Data Display

The format in which the data output messages from the RPU are displayed when using terminal communication interface software is shown in the example below. The RPU data output message fields include the current date, time, wind, temperature, dew point, and humidity at the RPU installation site as well as a built-in-test (BIT) message to alert the operator at the Workstation of any abnormal operating conditions at the RPU (see Table 4-1).

```
#05110011
03/06/21,14:00:00,11,5,252,0,9,0,23.8,11.1,44,0,0,0,43
#05110011
03/06/21,14:00:05,11,6,250,0,9,0,23.8,11.1,44,0,0,0,45
```

Table 4-1: RPU Data Output Message Field Identification

#SIDPID	YY/MM/DD	hh:mm:ss	ID	SP	WD	WC	PK	PK*	AT	DP	RH	GU	GU*	BIT	CHKSM
#05110011	03/06/21	14:00:00	11	5	252	0	9	0	23.8	11.1	44	0	0	0	43
DEFINITIONS:															
#SIDPID:	Combined four digits RPU Secondary Identification Number and four digits RPU Primary Identification Number (i.e. #05110011).														
YY/MM/DD:	Two digit year, month, and day.														
hh:mm:ss:	Two-digit hour, minute, and second (in UTC time).														
ID:	RPU Primary Identification Number.														
SP:	Current 2-minute average wind speed in knots ($\pm 3\%$).														
WD:	Current 2-minute average wind direction in degrees ($\pm 2^\circ$).														
WC:	0 = Steady WD, 1 = Variable WD.														
PK:	The maximum 5 second wind speed in the last 2 minutes.														
PK*:	1 = The PK > 24 knots; indicates a possible NWS reportable peak wind speed (Alert Condition).														
AT:	Current 5-minute average ambient temperature in degrees Celsius ($\pm 0.2^\circ\text{C}$).														
DP:	Current 5 minute average dew point temperature in degrees Celsius ($\pm 2.0^\circ\text{C}$).														
RH:	Current 5 minute average relative humidity by percent ($\pm 3\%$).														
GU:	Maximum gust wind speed in the last 10 minutes. Set if the SP > 8 knots AND if														

	the difference in the recorded maximum and minimum wind speed in the last ten minutes is > 9 knots AND if the difference in the recorded maximum wind speed in the last ten minutes and SP > 4 knots. Once set, the GU continues to be reported for at least a 10 minute duration unless the difference in the recorded maximum wind speed in the last 10 minutes and SP > 2 knots.
GU*:	1 = The SP > 19 knots AND the current SP > the SP two minutes ago +14 knots; indicates a possible squall condition (Alert Condition).
BIT:	Hexadecimal built-in-test (BIT) message.
CHKSM:	Integer checksum value.

4.3 RSOIS Software Verification, Download, and Installation

The RSOIS Data Display Software is updated and compiled into a HEX file by the vendor. Each site is responsible for verifying the version and, if necessary, uploading the latest firmware versions. This section provides instructions on the back-up, download, and upload of the revised RSOIS RPU configuration files.

4.3.1 RSOIS Software/Firmware Verification

1. First, identify and record the software/firmware that is on your RSOIS. Use the RWS computer to open Internet Explorer and go to the OPS1 web page: <https://www.ops1.nws.noaa.gov/> for a listing of current software/firmware versions.
2. Select **ART, RRS, RSOIS, Windprofiler**.
3. Sign in with your NOAA email username and password.
4. Select **What's New** and **RRS Software Status**. Look under *RSOIS Software Versions* to verify that the programs that you now have are the most current versions available.

4.3.2 RPU Configuration File Back-Up Procedure

NOTE: Detailed configuration file back-up information is located in NWS EHB 9-201, Appendix F, section F-1. A summary of RSOIS upload procedures follow:

The purpose of this section is to save a back-up copy of the current RPU Config File for protection until the new Config File is successfully loaded and operating.

1. Turn on the RWS computer in the upper air office.

NOTE: If fiber optic communications to the RPU are not available, take a PC to the RSOIS field site and perform the back-up function directly on the RPU.

The Base Station's terminal pass-through mode is **not** to be used to backup the RPU configuration.

2. Start OBIT with the RWS Application Program turned on.
3. Use the Offline Maintenance Menu to get the device/port assignment. (If OBIT is run directly without the RWS Application Program being active, only the internal simulator will operate.)
4. Select **Close** on the RWS Application Program (without *Exiting RWS* and without turning off the UPS).

5. Click the desktop "**RRS Offline Menu**" icon. The *Offline Maintenance Menu* screen appears.
6. Select **RSOIS Maintenance**. Once the RSOIS test program is started, it will display a HyperTerminal view of the RSOIS port in a window format.
7. Type **u** and press **Enter** to display the *User Menu*.
8. Type **Z** and press **Enter**.
9. At the prompt: *Enter Administrator Password:* type **zeno** then press **Enter** to display the *ZENO Program Menu*.
10. Type **L** and press **Enter** to display the System Load Menu.
11. Type **t** and press **Enter**.

NOTE: DO NOT FOLLOW SCREEN INSTRUCTIONS, i.e., DO NOT "Enter Any Key to Continue."

12. Go to: **Transfer; Capture Text**. This step is to capture (copy) the current (superseded) RPU configuration file to the RWS hard drive for temporary backup purposes only.
13. Select *Temporary* folder, type **RPUxx.CFG** as the file name, and click **Start**.
14. Press **Enter**. This step saves and displays the current (old) config file.
15. Go to: **Transfer; Capture Text;** and click **Stop** to turn off *Capture Text*.
16. Press **Enter** to return to the *System Load Menu*.
17. Type **z** (space) **q** and press **Enter** to exit the *ZENO Program Menu* and the *User Interface*.

4.3.3 Software Download/Unzip Procedure from Web Site

The actual software/firmware programs are also available on the OPS1 site as zipped files that need to be downloaded to the computer and unzipped. Use the following procedures to perform the download/unzip functions:

1. Open Internet Explorer and go to the OPS1 web page, <https://www.ops1.nws.noaa.gov/> for a list of current software/firmware versions.
2. Select **ART, RRS, RSOIS, Windprofiler**.
3. Sign in with your NOAA email username and password.
4. Select **What's New** and **RRS Software Status**. Look under *RSOIS Software Versions*.
5. Left click the selected .zip file, and select **Save**.
6. The *Save As* screen will appear and indicate the file will be saved to the Desktop. Click **Save**. A display screen will appear to indicate *Download Complete*.
7. After *Save* process, unzip and store it on the Desktop.
8. Close the OPS1 screen.

4.3.4 RPU Configuration File Upload Procedure

NOTE: To install the RSOIS program, execute the SETUP.EXE file. Installation of both the server and client programs on the same computer is not necessary; installation of one or

the other is strictly dependent upon the server or client designation of the particular computer.

NOTE: Detailed installation and configuration setup information is located in NWS EHB 9-201, Appendix F. A summary of RSOIS upload procedures follow.

Following the download of the new configuration file, perform upload of the new configuration file using the RWS.

NOTE: The new file will overwrite the current (old) Zeno RPU configuration file.

1. Start OBIT with the RWS Application Program turned on.
2. Use the *Offline Maintenance Menu* to get the device/port assignment. (If OBIT is run directly without the RWS Application Program being active, only the internal simulator will operate.)
3. Select **Close** on the *RWS Application Program* (without exiting RWS and without turning off the UPS).
4. Click the desktop "**RRS Offline Menu**" icon. The *Offline Maintenance Menu* screen appears.
5. Select **RSOIS Maintenance**. Once the RSOIS test program is started, it will display a HyperTerminal view of the RSOIS port in a window format.
6. Type **u** and press **Enter** to display the *User Menu*.
7. Type **z** and press **Enter**.
8. Type **L** and press **Enter** to display the *System Load Menu*.
9. Type **xr** and press **Enter**.
10. Type **y** and press **Enter**.
11. Go to: **Transfer; Send File**. Click on the **RWS Desktop** to find new configuration file. Click **Open**.
12. Once the file has been selected, click **Send** to begin the upload.
13. Type **z** and press **Enter** to display the *Zeno Program Menu*.
14. Type **u** and press **Enter** to display the *User Menu*.
15. Type **f** and press **Enter** to display the *System Function Menu*.

NOTE: Be sure to change the Primary ID and the Secondary ID after uploading the files onto the RPU. The Primary ID number on the RPU consists of two numbers and the Secondary ID number consists of three numbers (i.e., Primary ID: 13; Secondary ID: 513)

16. Type **c1/xx** (space) **c2/yyy**, and press **Enter** to change the Primary and Secondary Unit ID numbers.

NOTE: **xx** is the site-specific Primary RPU ID number and **yyy** is the site-specific Secondary RPU ID number. A label identifying the Primary and Secondary ID number of each RPU

is located inside the RPU enclosure door. In this example, 13 was entered as the Primary ID number and 513 was entered as the Secondary ID number.

17. Type **u** and press **Enter** to display the *User Menu*.
18. Type **z** and press **Enter** to display the *ZENO Program Menu*.
19. Type **e** and press **Enter** to *Save Parameters To EEPROM*.
20. Type **q** and press **Enter** to exit the *User Interface*.

This completes the installation of the new RSOIS RPU configuration file.