AWOS 3000

Automated Weather Observing System

User's Manual

	FAA APPROVED
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☐	**NOT FAA APPROVED**

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Rev. G

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The information and specifications described in this manual are subject to change without notice.

Latest Manual Version
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Revision History

Revision	Date	Summary of Changes
D	2011 May 31	Added 7150 BP sensor.
E	2016 August 22	Updated for 1793 VHF Transmitter
F	2017 October 5	Updated for new motherboard
G	2017 December 18	Removed AWOS Net details

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1

1. System Overview

The AWOS 3000 is a modular weather monitoring system that continuously measures an array of weather parameters at an airfield or helipad. The AWOS outputs the data to display terminals and broadcasts current conditions over VHF radio to pilots in the vicinity.

1.1 General

Figure 1 shows the main AWOS components.
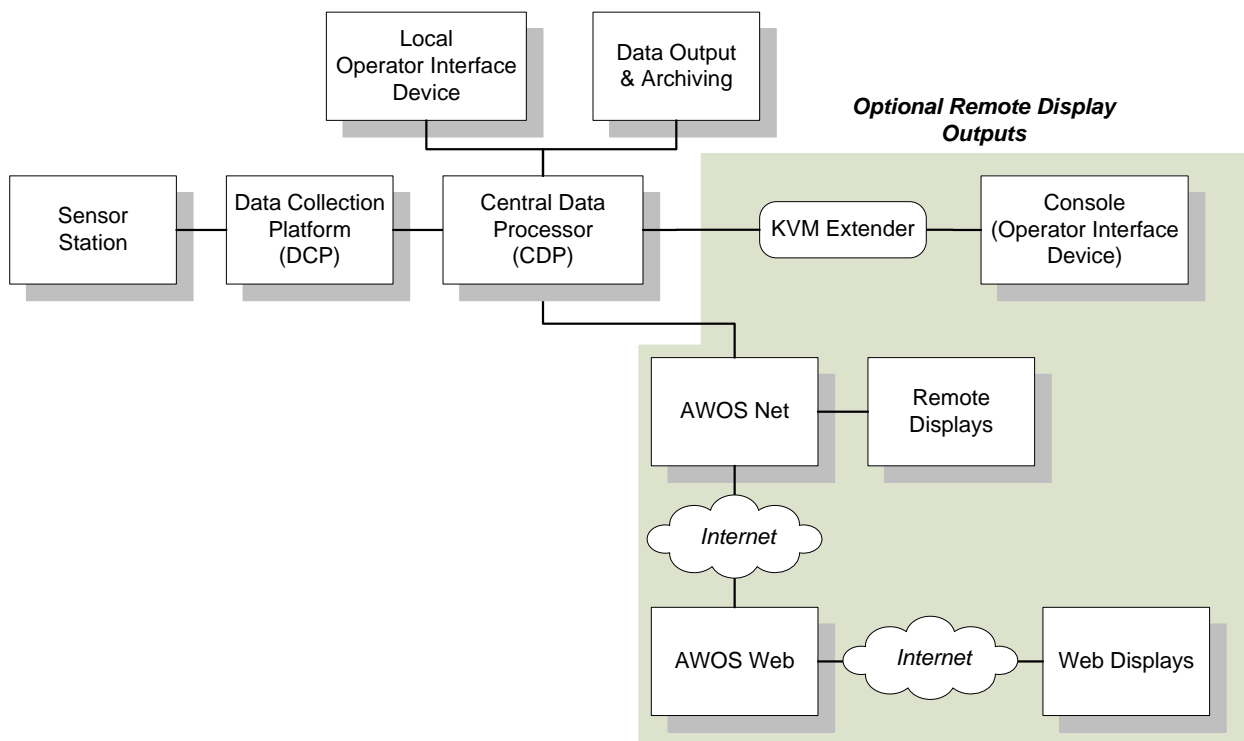
Figure 1. AWOS Components

A sensor station measures meteorological parameters, which are collected by a Data Collection Platform (DCP). Data processing, communications, and overall system operation is controlled by the Central Data Processor (CDP), which also archives and outputs the weather observations.

Optional remote display interfaces are also possible.

- The KVM Extender can be used for a remote operator terminal to interface to the CDP using a patch cord between the KVM Extender units.

- AWOS Net can be used to broadcast data via an Ethernet connection to all active remote displays or via the Internet to allow remote users to view the AWOS data on any compatible computer using a standard Web browser.

A NADIN connection is possible via a direct connection to the CDP or via a Virtual Private Network using the AWOS Net and AWOS Web interface.

1.2 Sensor Station

The sensor station measures a full array of meteorological parameters using a configurable suite of sensors. Available sensors include wind speed, wind direction, barometric pressure, air temperature, dew point temperature, relative humidity, rainfall, cloud height and sky condition, visibility, present weather, thunderstorm detection, and freezing rain. The standard configurations are listed later in this chapter.

A self-supporting tower is used as the mounting platform for the basic sensor suite. Tilt-over towers can be provided as required. When included, the ceilometer, visibility sensor, thunderstorm/lightning detector, and freezing rain sensor are mounted on separate foundations. All outdoor enclosures meet IP65 (NEMA 4X) specifications.

The AWOS is protected by a comprehensive network of lightning and transient surge protection components. Tranzorbs, MOVs, and resistors protect all sensor lines, power lines, telephone lines, and communication lines against lightning-induced surges and power line transients and surges.

1.3 Data Collection Platform (DCP)

The sensor station is paired with a Data Collection Platform (DCP). Located on the sensor tower, the DCP collects data from the sensors, performs error detection on the received information, converts the sensor data into engineering units, and transmits message packets containing sensor data and status information to the Central Data Processor (CDP) every 5 seconds.

Communications between the DCP and CDP can be accomplished via RS-485 landline or UHF radio link. The DCP data packets contain a cyclic redundancy check (CRC) that allows the CDP to determine if any transmission errors have occurred. The CDP ignores data that is not received correctly.

The dual barometric pressure sensor is housed within the DCP. A keypad and display built into the DCP allow for on-site viewing of data and sensor maintenance.

1.3.1 DCP Display Screens

A keypad and LCD display screen are located inside the DCP enclosure, and are used to view sensor data and to perform maintenance checks. The * and # keys on the keypad are used to move through the screens. To move to a higher numbered screen, press the # key. To move to a lower numbered screen, press the * key. The DCP screens are explained in the *Model 1190 Data Collection Platform User's Manual*.

1.4 Central Data Processor (CDP)

Data processing, communications, and overall system operation is controlled by the Central Data Processor (CDP). The CDP is mounted in an industrial-grade rack along with a UPS. The rack also houses the VHF ground-to-air radio and any of the CDP options, including UHF data link radio, and AWOS Net. These options are explained in Chapter 2.

1.4.1 Voice Output

A VHF transmitter broadcasts AWOS data in voice format to aircraft in the vicinity. Remote users can also listen to weather information over a phone line or, using the optional AWOS Net, access the data over the Internet.

The voice output is generated automatically using collected AWOS data. Custom voice remarks can be added to the voice output by the operator when conditions warrant (see Chapter 2).

1.4.1.1 VHF Radio

The VHF transmitter operates in the 118–136 MHz band, with the following specifications.

Channel Spacing	25 kHz
RF Power Output	3 W maximum
Frequency Stability	±0.001% (-30°C to +60°C)
Emission Type	6K00A3E (formerly 6A3E)
Spurious and Harmonic Emissions	80 db minimum up to 90% modulation

1.4.2 Data Reduction

The CDP data reduction software performs quality control checks on the data prior to meteorological algorithm processing to ensure that the data received is accurate and complete, and that the associated equipment is working properly. If data from any sensor is erroneous or missing (e.g. sensor power loss), the parameter and all other parameters derived from the missing parameter are reported "missing" in the weather observation. The CDP continues to sample data, and if the error condition is corrected, the weather parameter is restored in the AWOS report.

The CDP sets upper and lower limits on the sensor output corresponding to the normal operating limits of the sensor.

1.4.3 Data Archiving

The CDP stores collected AWOS data in a series of data logs covering all aspects of AWOS operation. The logs can be viewed in *Archives View* (see Section 10.4), and are organized as follows.

- Alarms
- Communication Status
- DCP Message
- METAR
- One Minute Data
- Printer
- System Status

Historical data can also be viewed and saved using the *Historical Data* option on the *File* menu (see Section 8.3).

1.5 Remote Display Options

Two types of optional remote display interfaces are available.

- The KVM Extender can be used for a remote operator terminal to interface to the CDP using a patch cord between the KVM Extender and the CDP. The KVM Extender consists of a local unit, located near the CDP, and a remote unit, located near the remote operator interface, and the distance between the local and the remote units can be up to 700 feet. This is useful when the CDP is installed in an equipment room and the actual operator of the AWOS is located elsewhere, such as in the observation tower.

- AWOS Net can be used to broadcast data via an Ethernet connection to all active remote displays or via the Internet to allow remote users to view the AWOS data on any compatible computer using a standard Web browser.

The KVM Extender uses a proprietary bidirectional communication protocol, while AWOS Net is restricted to relaying data provided by the CDP.
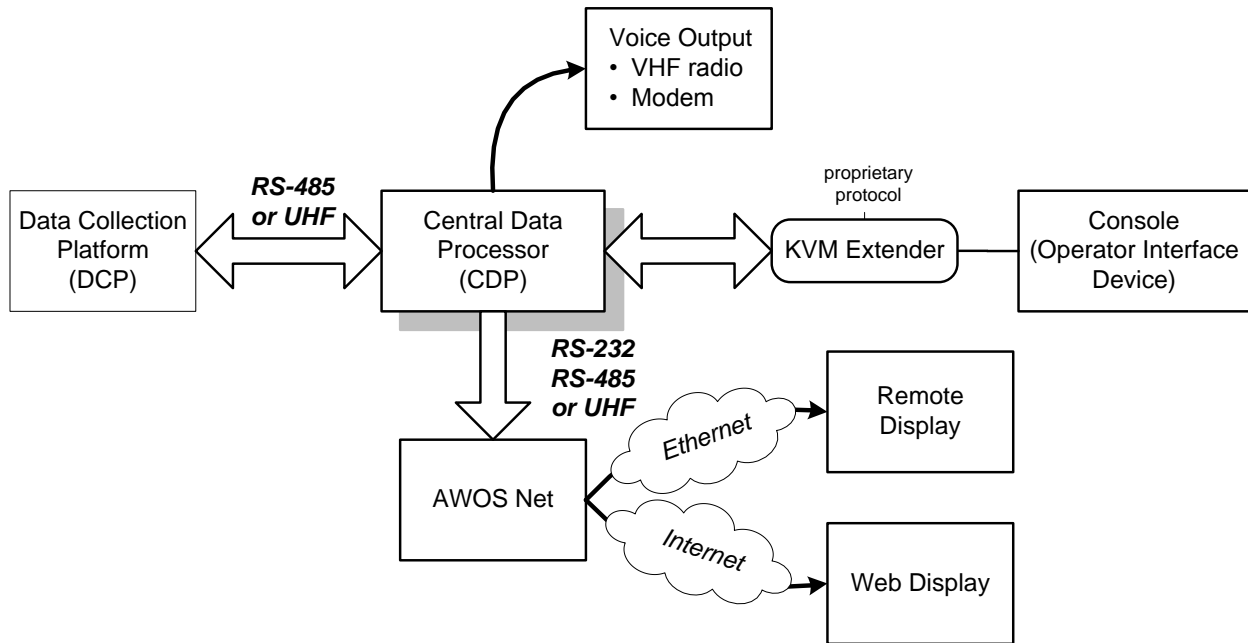
Figure 2. CDP Interfaces with DCP and Optional Remote Stations

The remote console (Operator Interface Device) connected to the CDP by the KVM Extender has complete bidirectional communication capability to interact with the CDP.

Remote displays are display-only stations that use AWOS Net to obtain their data from the CDP. The AWOS Net consists of an AWOS Net Controller and a communication interface communicating with the CDP using an RS-232 or an RS-485 landline, or a UHF radio link.

The AWOS Net Controller acquires the data via the CDP communication interface, then encapsulates it and broadcasts it via Ethernet connection to all active remote connections. This permits AWOS Net Remote Displays to receive current data within milliseconds of the CDP broadcasting the update. To ensure the reliability of the data, all communications are validated for timeliness and correctness before display to the user. The AWOS Net cannot send any information to the AWOS, and therefore cannot distort or otherwise alter the AWOS data.

The remote displays mirror the data displayed at the CDP following processing and application of the AWOS algorithms.

1.5.1 Web Displays

Web displays allow remote users to view the AWOS data on any compatible computer using a standard Web browser.

1.6 AWOS Configurations

AWOS systems are available in several configurations. The configurations differ primarily in the sensors included and the communication output mode used (landline or radio).

1.6.1 AWOS I

AWOS I systems provide data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude

1.6.2 AWOS II

AWOS II systems add a visibility sensor, rain gauge and day/night detector to the AWOS I array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection

1.6.3 AWOS A

AWOS A is a minimal system requiring only a Barometric Pressure sensor. The AWI AWOS A provides FAA certified data for the following parameter.

- Barometric Pressure

As long as the Altimeter Setting is calculated using the *certified* Barometric Pressure, the resulting Altimeter Setting is considered to be *certified*. This is the calculation that must be used for the AWOS A to be FAA certified. See Section 1.6.4 for more information.

1.6.4 AWOS A-V

AWOS A-V is a minimal system requiring only Barometric Pressure and Visibility sensors. The FAA has certified the AWI AWOS II as an AWOS A-V. The AWI AWOS A-V provides FAA certified data for the following parameters.

- Barometric Pressure
- Visibility and Variable Visibility

The remaining parameters reported by the AWOS A-V are considered to be advisory.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Density Altitude
- Rainfall
- Day/Night Detection

There are two ways to calculate the Altimeter Setting — with and without temperature.

- If the calculation uses the *advisory* Temperature with the *certified* Barometric Pressure, the resulting Altimeter Setting is considered to be *advisory*.

- If the calculation uses only the *certified* Barometric Pressure, the resulting Altimeter Setting is considered to be *certified*. This is the calculation that must be used for the AWOS A-V to be FAA certified.

1.6.5 AWOS III

AWOS III systems add a ceilometer to the AWOS II array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection
- Sky Condition and Cloud Height, up to 3 layers

1.6.6 AWOS III-P

AWOS III-P systems add a present weather sensor to the AWOS III array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection
- Sky Condition and Cloud Height, up to 3 layers
- Present Weather (rain, snow, drizzle, mist, fog, freezing fog, haze)

1.6.7 AWOS III-T

AWOS III-T systems add thunderstorm detection to the AWOS III array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection
- Sky Condition and Cloud Height, up to 3 layers
- Thunderstorm/Lightning Detection

1.6.8 AWOS III-PT

AWOS III-PT systems add thunderstorm detection to the AWOS III-P array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection
- Sky Condition and Cloud Height, up to 3 layers
- Present Weather (rain, snow, drizzle, mist, fog, freezing fog, haze)
- Thunderstorm/Lightning Detection

1.6.9 AWOS III-PTZ

AWOS III-PTZ systems add a freezing rain sensor to the AWOS III-PT array. The system provides data for the following parameters.

- Wind Speed and Gust
- Wind Direction and Variable Wind Direction
- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Altimeter Setting
- Density Altitude
- Visibility and Variable Visibility
- Rainfall
- Day/Night Detection
- Sky Condition and Cloud Height, up to 3 layers
- Present Weather (rain, snow, drizzle, mist, fog, freezing fog, haze)
- Thunderstorm/Lightning Detection
- Freezing Rain

1.7 Sensor Reporting Table

Table 1 shows reporting criteria for each of the AWOS sensors.

- The **Reporting Units** column shows the units in which the sensor data is reported.

- The **Sliding Window** size shows the size of the sliding window used for data averaging. All sensors, with the exception of precipitation, use a sliding window average. Precipitation reports accumulation from the top of the current hour, and is reset to 0 at the top of the next hour.

- The **Time to First Report after CDP Power Up** shows the length of time before data appears on the display following power-up or restart of the CDP.

Table 1. Sensor Reporting Table

Sensor	Reporting Units	Sliding Window Size	Time to First Report after CDP Power Up
Wind Speed	Knots	2 min	90 s
Wind Gust (last 10 minutes)	Knots	10 min	90 s
Wind Direction	Nearest 10° magnetic	2 min	90 s
Variable Wind Direction	Nearest 10° magnetic	10 min	90 s
Temperature	°C	5 min	4 min
Dew Point	°C	5 min	4 min
Altimeter Setting	InHg	1 min	1 min
Density Altitude	Feet	5 min	4 min (not reported if <1,000' above field elevation)
Visibility	Statute miles	10 min	8 min
Variable Visibility	Statute miles	10 min	8 min
Precipitation	0.01 inches	Up to 1 h	<1 min
Sky Condition (up to 3 cloud layers)	100 feet	30 min	28 min
	Clear (SKC/CLR): no clouds below 12,500 feet		
	Few: ≥6% to 24% sky cover		
	Scattered (SCT): ≥25% to 49% sky cover		
	Broken (BKN): ≥50% to 87% sky cover		
	Overcast (OVC): >87% sky cover		
	Obscured (VV): cloud bases at surface/fog		
Thunderstorm/Lightning	Nautical miles	15 min	1 min
	At airport: 0–5 nautical miles		
	In vicinity: 5–10 nautical miles		
	Distant: 10–30 nautical miles. In addition to distance, octant directions are provided for lightning detected in this distance range.		
Present Weather	Precipitation type and rate	10 min	8 min
Freezing Rain	Freezing rain	15 min	8 min

1.8 AWOS Output Modes

The output of the AWOS weather observation can be classified into one of four modes of operation. The mode in effect is dependent on the extent to which voice remarks and manual observations are used.

1.8.1 Mode 1—Full-Time Automated Operation

In this mode, the AWOS operates 24 hours a day without any manual input. The automated weather observations are updated on a minute-by-minute basis. There is no weather observer input to the AWOS. However, a manual observing capability may be maintained as a backup, provided that an agreement with the National Weather Service (NWS) to maintain a manual observing capability exists.

1.8.2 Mode 2—Full-Time Automated Operation with Local Notice to Airmen (NOTAM)

Operation in this mode is the same as Mode 1, with the addition of the capability to append a manually recorded NOTAM to the automated voice reports. The airport manager is responsible for the NOTAM information. The NOTAM information is heard on the local voice broadcast; it is not transmitted longline. There is no weather observer input.

To operate the AWOS in Mode 2, enter a voice remark using the *Voice Remarks* option on the *Edit* menu.

1.8.3 Mode 3—Full-Time Automated Operation with Manual Weather Augmentation and Local NOTAM Option

Operation in this mode provides the capability for a weather observer to manually augment the automated observation by appending a weather entry to the observation during the published weather observer duty hours. The observer duty hours should be published in the Airport/Facility Directory. The addition of a local NOTAM is also permitted in this mode of operation, provided there is no interference with the observer augmentation. The weather observer is responsible for the accuracy and timeliness of the added weather information.

Manual observations are entered using the *Manual Observations* menu. Any information that cannot be entered through a manual observation can be appended using the *Edit > Voice Remarks* and *Reports > METAR Remark* menu options.

1.8.4 Mode 4—Part-Time Manual Operation

Operation in this mode, normally used for backup, permits a weather observer to enter a complete manual observation into the system. The procedures in Federal Meteorological Handbook 1 (FMH-1) or Federal Meteorological Handbook 9 (FMH-9) apply to the recording and formatting of these manual observations.

When operating in Mode 4, all sensors should be turned off using the *Turn On/Off Sensors* option on the *Edit* menu. Manual observations can then be entered using the *Manual Observations* menu. Any information that cannot be entered through a manual observation can be appended using the *Edit > Voice Remarks* and *Reports > METAR Remark* menu options.

2. Central Data Processor

The CDP is mounted in an industrial-grade rack (Figure 3), along with an Uninterruptible Power Source (UPS), VHF ground-to-air radio, voice/RMM modem, and any of the CDP communication options. The available options include RS-485 data link, UHF radio data link, and AWOS Net.

Figure 3. AWOS 3000 CDP Rack

2.1 CDP Rack Layout

The CDP components are housed on two shelves inside the rack's lockable enclosure. The shelves can be accessed via the front door or either of the side doors. The easiest entry point will depend on the component being accessed.

2.2 Back Panel Connections

The back panel (Figure 4) is where connections to external devices and data sources (such as the AWOS DCP, GPS Receiver, and printer), as well as internal components (such as VHF Radio and Modem) are made. All connections are surge protected.

The back panel is located inside the CDP rack, just above the bottom shelf (see Figure 7). External cables are routed to the back panel through an access hole located in the right rear corner at the top of the rack enclosure. Access to this panel is through the side doors.
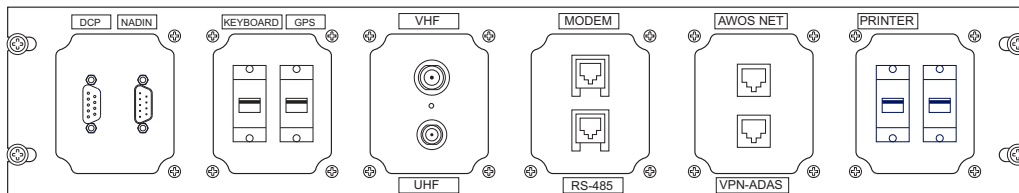
Figure 4. CDP Back Panel Connectors

Other components and the optional ATIS/AWOS Interface are connected to the Interface Board (Section 2.3.3).

2.3 CDP Top-Shelf Components

The top shelf (Figure 5) is attached the back of the CDP monitor and contains the **CPU** assembly, **Power Supply**, **Interface Board**, **Voice Modem**, and **communication interface** (RS-485 converter or UHF radio). The shelf can be accessed by removing four screws from the corners of the front panel (Figure 6) and sliding the entire shelf, with the monitor, forward.
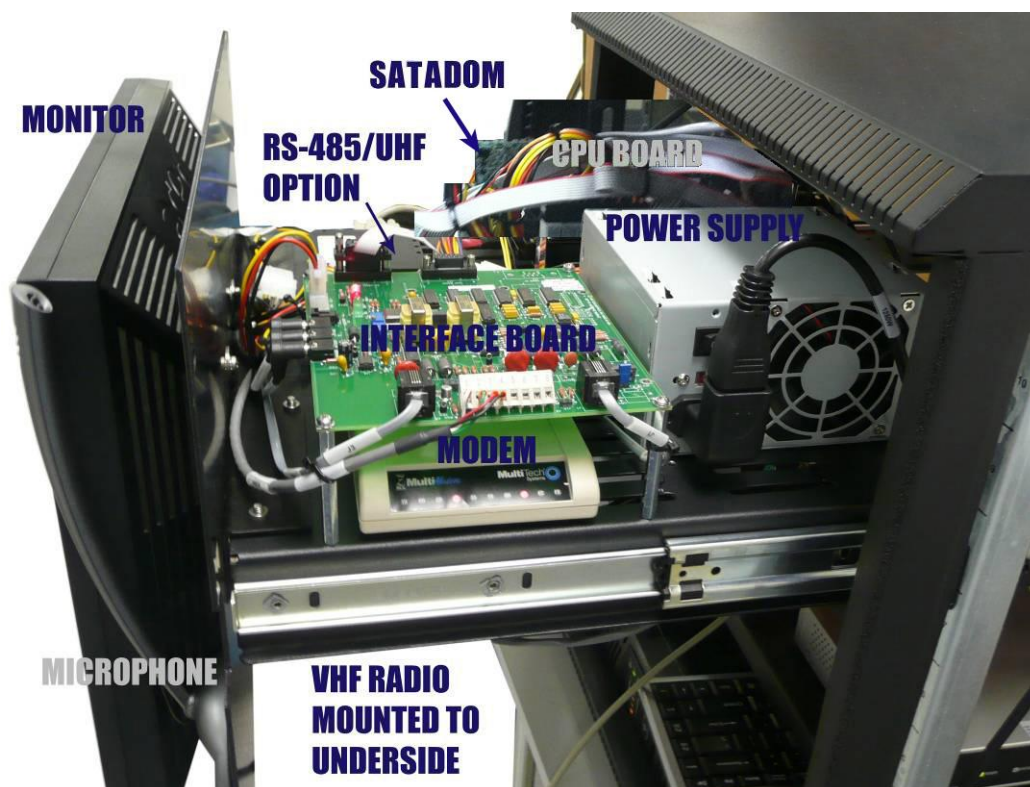
Figure 5. CDP Top Shelf
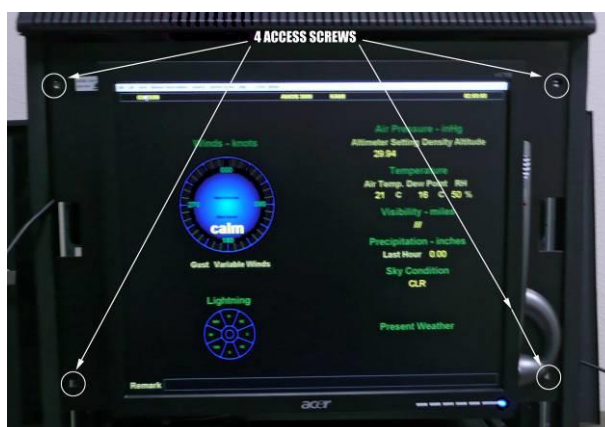
Figure 6. Four Screws Securing Top Shelf

2.3.1 CPU Board

The CPU Board is the CDP's main processor.

2.3.2 SATADOM

The SATADOM solid state drive is used to store archive data, group and user information, and the site-specific configuration data. The operating system and AWOS 3000 software are stored on a read-only partition.

2.3.3 Interface Board

The Interface Board provides interconnections for the CDP components. The individual connections are shown on wiring diagram 3000-019 in Appendix B.

2.3.4 Power Supply

The Power Supply is a minimum 300 W power supply that provides power to all the CDP components.

2.3.5 Communications

Communication between the DCP and CDP can be accomplished using RS-485 landline or UHF radio data link. The method used will depend on several site factors, including the distance between the DCP and CDP, landline feasibility (trenching issues, cable installation, etc.), and unobstructed line-of-sight for radio use.

The hardware for the communication options—RS-485 converter or UHF radio—mounts to the top shelf in front of the CPU Board/Hard Drive assembly.

2.3.6 VHF Ground-to-Air Radio

The Model 1792 or 1793 VHF Ground-to-Air Radio transmits the AWOS voice message to aircraft in the vicinity. The radio is a low-power VHF/AM transceiver that operates in the frequency range 118.000 MHz to 136.975 MHz with 25 kHz spacing. The radio is mounted on the underside of the top shelf of the AWOS rack (see Figure 7), and is installed at the factory.

2.3.7 Voice Modem

An M406159-00 voice modem is mounted to the top shelf below the Interface Board (see Figure 6). The modem is used for Remote Maintenance Monitoring (RMM) and for dial-up access to the AWOS voice message. It is installed at the factory.

2.3.8 Monitor Volume Controls

The AWOS voice output can be heard through the monitor's built-in speakers. To adjust the speaker volume, use the monitor's Volume Up (+ or >) and Volume Down (- or <) controls, located on the monitor bezel below the screen.

2.4 CDP Bottom-Shelf Components

The CDP rack's bottom shelf (Figure 7) is fixed in place. Components are accessible through the rack's front or side doors. The bottom shelf holds the optional **AWOS Net** and **VPN router**.
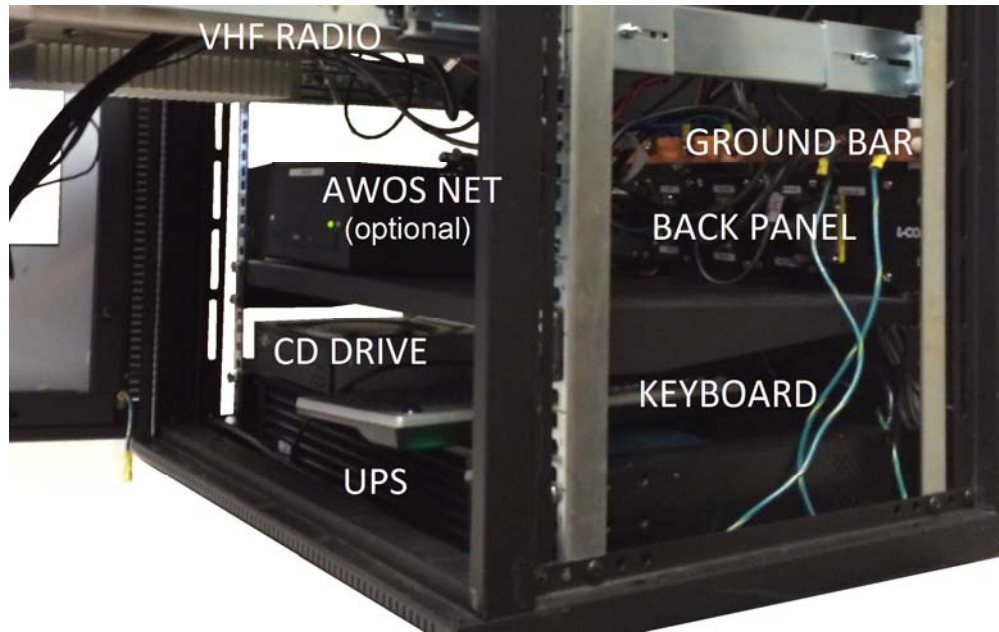
Figure 7. CDP Bottom Shelf Components

The **UPS** is housed in the base of the rack, beneath the bottom shelf. The **CD drive** rests on the UPS. When not in use, the **keyboard** is stowed on top of the UPS as well.

The **back panel**, where cable connections are made to the major components, is mounted to the back of the rack just above the bottom shelf.

The CDP's ground cables connect to the **ground bar**, which is mounted to the rear of the rack just above the back panel.

2.5 UPS

Continuous power to the CDP equipment is ensured by an Uninterruptible Power Source (UPS) housed in the base of the rack (Figure 7). If main power is lost, the backup power system will provide a minimum of 45 minutes of backup power to the CDP equipment.

2.6 GPS Receiver

A GPS receiver (Figure 8) is used to provide time synchronization for the CDP, which displays UTC and logs events with their UTC time stamp. The receiver, housed in a small, oval package, is installed outside the CDP. It can often be affixed to the top of the rack, depending on satellite reception. The GPS receiver presently used is approved only for use at an indoor location.

Figure 8. GPS Time Standard Receiver

2.7 NADIN Connection

If NADIN is used with the AWOS 3000, the NADIN serial cable is routed into the CDP and connected to the back panel. This is a serial one-way connection used to send METARs. METARs are sent as they are generated, so changing the METAR frequency (*Edit > Configuration > Reports > METAR*) will affect the NADIN interface as well.

2.8 Optional KVM Extender for Remote Operation

The KVM Extender Kit (M488342-00) can be used for a remote operator terminal to interface to the CDP using a patch cord between the KVM Extender Kit and the CDP. This is necessary when the CDP is installed in an equipment room and the actual operator of the AWOS is located elsewhere, such as in the observation tower. The remote location will allow the same access to the CDP as if the user is physically at the CDP. This location must be within 700 feet of the CDP.

The KVM Extender (M406245-00) consists of the following parts.

1. Local Unit – This unit connects to the CDP. The top unit in Figure 9 is a front view of the Local Unit.

2. Remote Unit – This unit is located where the operator terminal is desired. The bottom unit in Figure 9 is a front view of the Remote Unit.

   *Note that the Local Unit and the Remote Unit are a matched set. If the need arises to replace either unit, they **must** be replaced as a set.*

Figure 9. KVM Extender

3. Two grounding cables — One grounding cable for the Local Unit, one grounding cable for the Remote Unit. The grounding cables are used to connect the ground posts of the Local Unit and the Remote Unit to their respective devices, the CDP and the remote operator terminal.

4. KVM cable assembly – This cable connects the Local Unit to the CDP's monitor and audio speaker/microphone jacks. The cable assembly includes the USB connection to the motherboard.

5. Two power supplies – One power supply will power the Local Unit and the other power supply will power the Remote Unit.

6. Remote Operator Interface — Monitor, keyboard, mouse, speaker, and microphone.

A customer-supplied standard CAT6 Ethernet cable built to standard TIA/EIA-568-B.2-2001 with RJ-45 connectors wired to the T568B scheme is used to connect the Remote Unit to the Local Unit. Figure 10 shows a wiring diagram for the cable end. This cable may be up to 700 feet long and must be a straight-through cable, *not* a crossover cable.
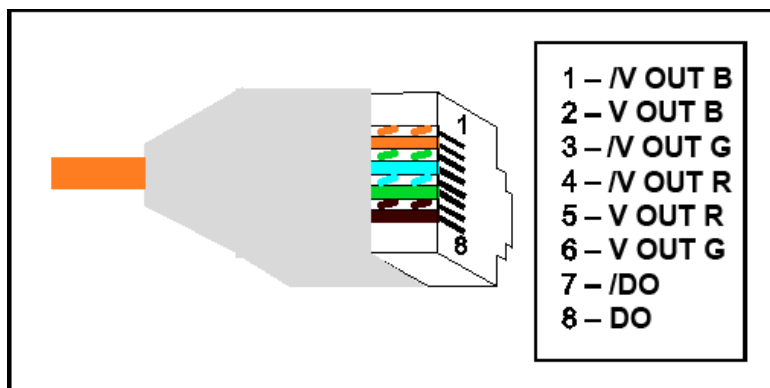
Figure 10. RJ-45 Connectors Wired to T568B Scheme

Figure 11 illustrates the connection of the KVM extender units using the Ethernet cable.
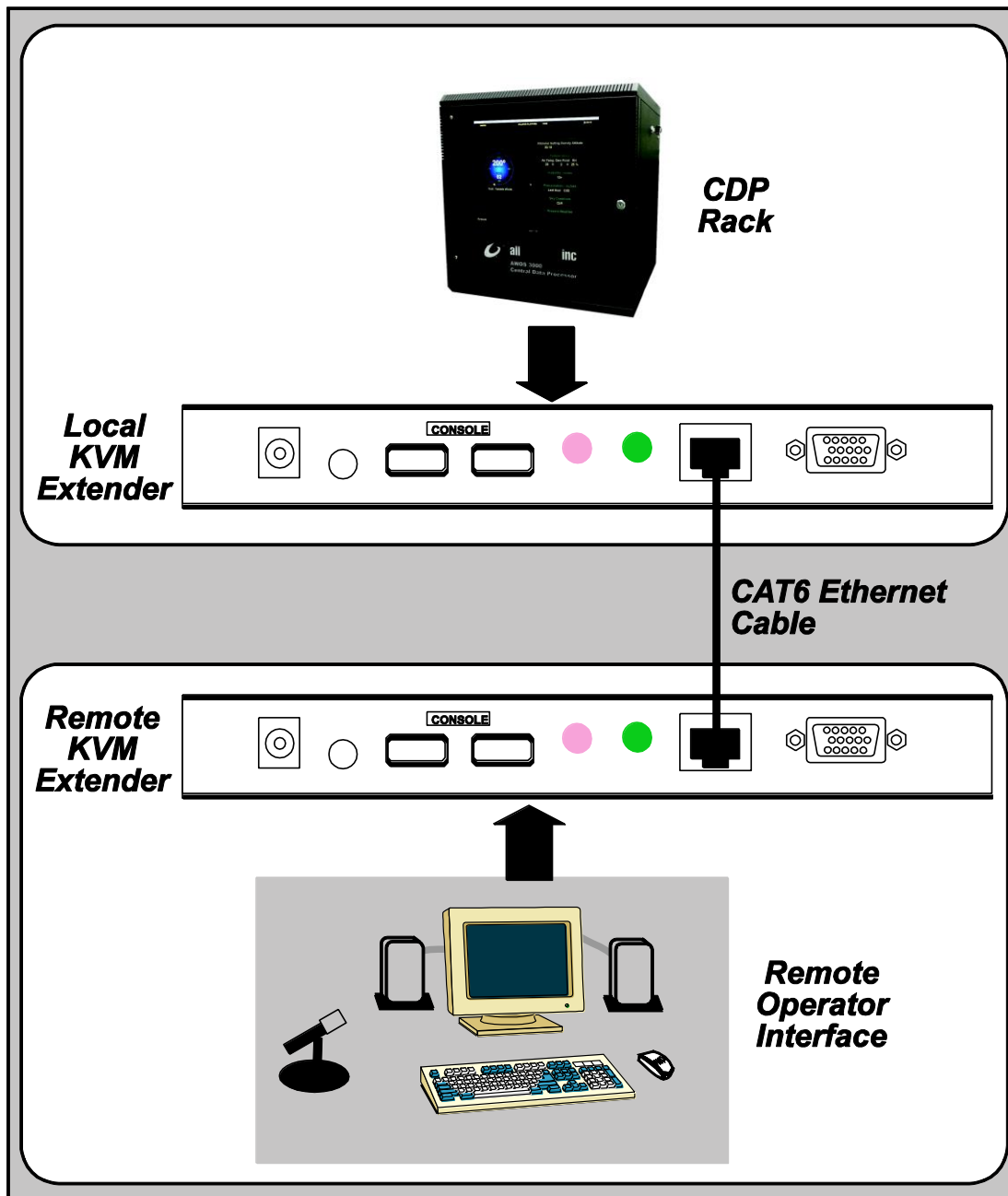
Figure 11. Topology of Local and Remote KVM Extender

The Ethernet cable between the two KVM extender units must not be connected to an Ethernet network or any other connections. There must be no other connections between the two KVM extender units.

2.8.1 KVM Extender Operation

The link light on the front of the Remote Unit should be on to indicate the link is made between the local and remote units.

For proper operation, the KVM extender should be in AUTO mode. This mode is controlled by the buttons on both the Remote Unit and Local Unit. On the Local Unit, this button is labels **AUTO/REMOTE** and on the Local Unit it is labeled **AUTO/LOCAL**. Pressing these buttons will switch between AUTO mode and the mode for that unit. AUTO mode allows both locations to be used.

LOCAL mode (activated by pressing the button on the Local Unit) locks out the remote user. The remote location will not be able to access the CDP until the switch is pressed again to return to AUTO mode.

REMOTE mode is activated by pressing the button on the Remote Unit. This locks out the local user (at the CDP). The user at the CDP will not be able to access the CDP until the Remote Unit is placed back into AUTO mode.

There are LEDs near the mode buttons to indicate the operational status of the KVM extender units. On the Local Unit, there are two LEDs, remote and local. If they are flashing, the KVM extender is in AUTO mode. If one LED is on with the other off, that unit has control.

There is only one mode LED on the Remote Unit. If this LED is flashing, the KVM extender is in AUTO mode. If it is on, the Remote Unit has control, and if it is off, the Local Unit has control.

When the LEDs indicate a unit has control, this may be that there is a user actively using the CDP and not that the KVM extender is in that particular mode (local or remote).

Only one user can access the CDP at a time. The KVM extender will wait a few seconds once activity has stopped at one unit (remote or local) before it allows the other unit to access the CDP.

2.9 Optional AWOS/ATIS Interface

FCC Title 47 (regulation 87.527c) only allows one VHF frequency for sites that have both ATIS and AWOS systems. The AWOS/ATIS Interface connects the VHF and telephone modem outputs of both of these systems to one VHF transmitter and one telephone modem (Figure 12). A switch controls the mode of the VHF transmitter and modem. Power (+12 V DC) is supplied by the CDP. The ATIS/AWOS Interface is installed outside the CDP rack.
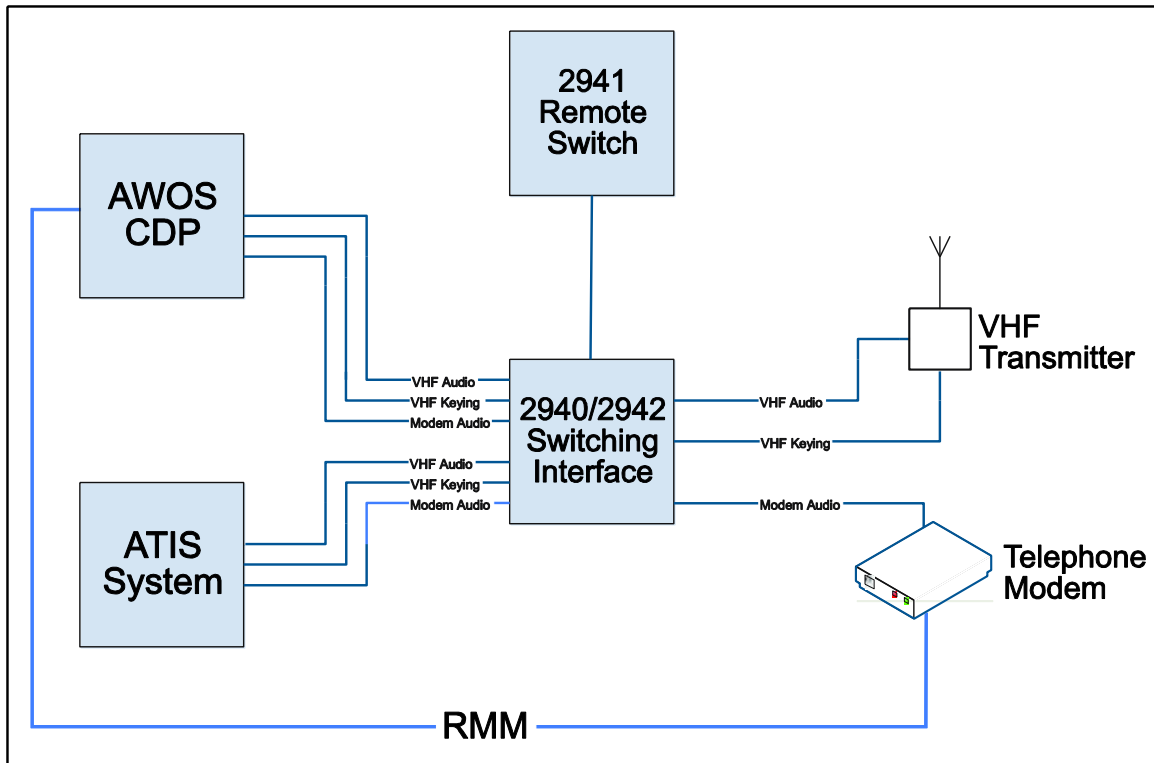
Figure 12. AWOS/ATIS Interface Block Diagram

Two enclosure models are available for the ATIS Interface.

- The Model 2940 is a 19" rack-mountable enclosure (see Figure 13). This model fits into the standard ATIS communication rack or any other standard 19" rack. The 2940 is a one rack unit (1RU) enclosure. There is no external mode switch on the 2940, therefore a Remote Switch (Model 2941) is required.

Figure 13. Model 2940 Rack-Mount ATIS Interface

- The Model 2942 (Figure 14) is a desktop version of the ATIS Interface. This model has an LED and mode switch on the front of the enclosure, and so does not require the Remote Switch. The Remote Switch can still be used with this model, however, if desired. *Important: When the Remote Switch is used with the Model 2942 desktop interface, the selection switch on the Model 2942 must always be in the ATIS position.*

Figure 14. Model 2942 Desktop ATIS Interface

2.9.1 Remote Switch

The Model 2941 Remote Switch (Figure 15) can be up to 1000 feet away from the ATIS Interface, and is connected to the interface with a CAT6 patch cord. The Remote Switch has a switch guard over the switch to prevent accidental switching of the ATIS Interface. The switch guard must be lifted before the switch can be changed to AWOS mode. When the switch guard is closed, the switch is automatically switched to ATIS mode. An LED indicator is illuminated when the switch is in AWOS mode.

Important: When the Remote Switch is used with the Model 2942 desktop interface, the selection switch on the Model 2942 must always be in the ATIS position (`AWOS` `ATIS` *) — if the 2942 AWOS/ATIS Interface is left in the AWOS position, the Remote Switch will not be able to toggle between the AWOS and ATIS options.*

When using the ATIS/AWOS switch, also set the **VHF Radio** to *Enable* on the *Edit > Configuration > Voice* tab with the AWOS software.

Figure 15. Model 2941 AWOS/ATIS Remote Switch

2.9.2 ATIS Interface Cable

The ATIS Interface Cable (Model M491838-00) is included with both enclosure models, and enables all the required connections inside the CDP: Power supply, modem audio, and VHF radio outputs.

2.10 CDP Block Diagram

A block diagram of the CDP components is shown in Figure 16. The colors in the diagram are used to group certain common components and are intended to make reading easier.
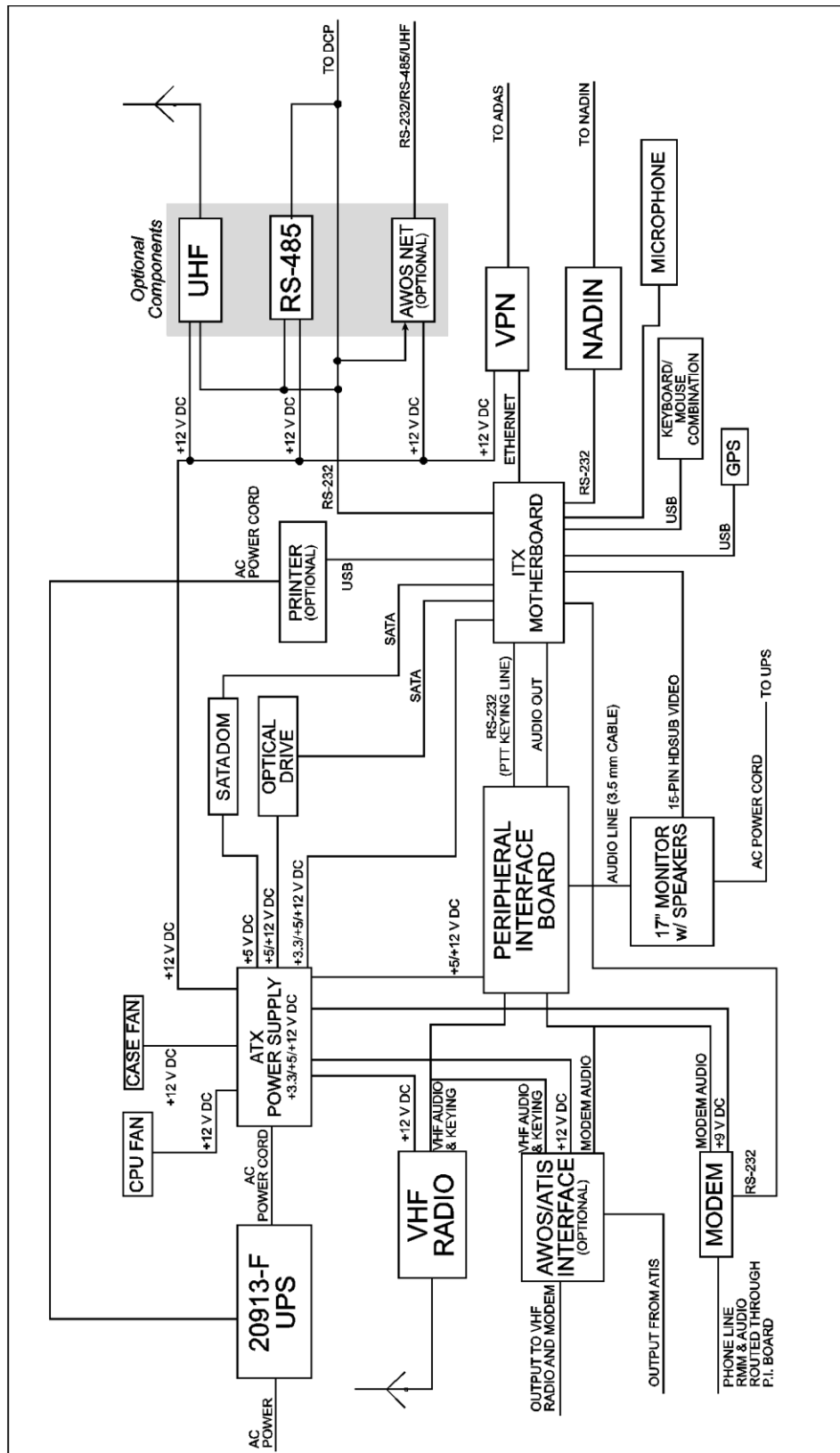
Figure 16. AWOS 3000 CDP Block Diagram

Chapter

3

3. AWOS 3000 Software Views

The AWOS 3000 software displays AWOS data in a combination of text and graphics in three selectable views, with each view geared toward a specific user group. The current view is selected by the user via the *View* menu.

Tower View   The Tower View presents a view of weather parameters of interest to Tower operations, including a graphic display of wind conditions. See Chapter 5.

Diagnostic View   The Diagnostic View is used by maintenance personnel to maintain and troubleshoot the system. This display provides a comprehensive view of system and sensor status. See Chapter 10.

Archives View   The Archives View provides access to stored data logs. See Chapter 10.

A series of menus allows administrators and users to control the data displayed, and enables the generation and transmission of reports, recording voice remarks, and access to archive data. User and group access is controlled by restricted Administrator menus, providing for controlled customization of the data display and software operation. The specific menu availability and the extent of customizability are controlled by the administrator, and depend on permission settings. The following chapters explain each of the views and the available menu options in detail.

Chapter

4

4. Alarms

The AWOS 3000 software includes an extensive alarm system to alert the user when specific conditions of concern are detected. A red **Alarm** warning will be shown at the top of the display when alarm conditions exist. When the alarm is "New"—hasn't yet been acknowledged or deleted—the color of the warning is bright red. Once the alarm has been acknowledged, the color will change to a lighter red. If the alarm is deleted, the **Alarm** warning will disappear. If the problem has not been corrected before deleting the alarm, however, the alarm will reappear.

There are two types of alarms: warnings and errors. The type of alarm depends on the severity of the detected condition.

Alarms can be based on several criteria, including

- a certain status bit being repeated several times (for example, a visibility sensor power supply failure),

- a certain number of occurrences within a time window (for example, CRC errors), and

- a comparison between two values (for example, DCP polls and responses) within a time window.

Using time windows and repeated occurrences helps eliminate accidental alarms.

4.1 Alarms List

Clicking the *Alarms...* option on the *System Status* menu calls up a list of current and past alarms, such as that shown in Figure 17. Each alarm entry in the list shows the date and time of the alarm, its status (New or Acknowledged), the type of alarm, and a brief description of the nature of the alarm. The time shown for the alarm is the time when the alarm condition was first met. The time is not updated when the alarm condition is met again.

You can acknowledge or delete active alarms from the *Alarms* list.
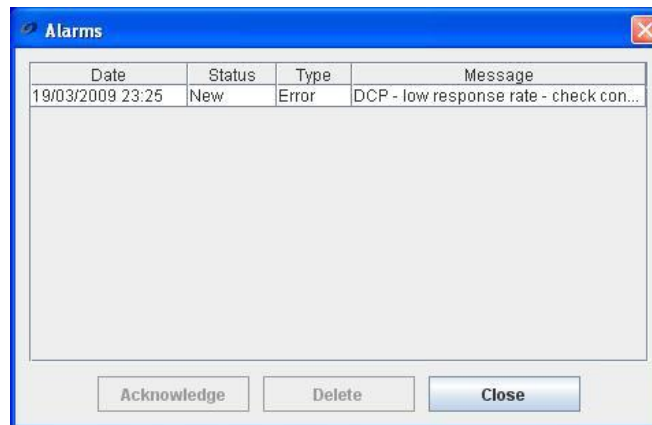
Figure 17. Alarms List

4.1.1 Acknowledging and Deleting Alarms

When an alarm is triggered, it will remain active (its status will show **New**) until either **acknowledged** or **deleted** by the user. No further entries for an active alarm will be added to the alarm list until it is acknowledged or deleted.

To *acknowledge* an alarm, click the alarm on the list to highlight it, then click the **Acknowledge** button at the bottom of the screen.

- "Ack" will be displayed in the *Status* column on the *Alarms* list

- The color of the **Alarm** text will change to a lighter red once all alarms have been acknowledged or deleted. The **Alarm** warning will continue to be displayed after the alarm is acknowledged (in the lighter color) even when alarm conditions no longer exist in order to keep an operator alert to intermittent problems.

To *delete* an alarm, click the alarm on the list to highlight it, then click the **Delete** button at the bottom of the screen.

- All visual warnings will stop and the **Alarm** notice on the main display will be removed

- The alarm will be deleted from the *Alarms* list; a record of the alarm will still be maintained in the *Alarms Log*

- If the conditions that triggered the alarm are not addressed before the alarm is deleted, the alarm will reappear

Click **Close** to close the *Alarms* list.

4.2 Blink Alarm

The *Blink Alarm* option controls the alarm's visual appearance on the display. If the box is checked, the **Alarm** notice on the main display will blink when active. If the box is unchecked, the **Alarm** notice on the main display will remain steadily on. Regardless of the setting, all alarms will appear on the *Alarms* list explained above.

5. Tower View

The Tower View is shown in Figure 18. This is the default view and does not require login. The screen is divided into sections, with each section showing a group of related values. Only sensors installed on a given system will be shown on the display. When an alarm is present, an **Alarm** notice will appear at the top of the display (refer to Chapter 4 for details on alarm behavior).

Figure 18. Tower View

5.1 Special Characters

Several special characters are used in the AWOS 3000 display and in data logs to indicate when data are missing, when sensors are offline or not installed, and when data have been entered manually.

Condition	Display	Reports
Missing Data	//	//
Sensor Turned Off	blank	#
Sensor Not Installed	field removed [1]	*
Data Entered Manually	blue text	<>

[1] The Present Weather field will be displayed whenever a visibility sensor is installed, even if no Present Weather sensor is installed

Figure 19 is a sample data log showing special characters in use. In the first entry, a number of fields show missing data, as indicated by slashes (Wind Speed, Wind Direction, etc.). Farther down in the file, Density Altitude and Altimeter Setting are shown as being turned off, indicated by ####. Finally, manual observations for Sky Condition are shown near the bottom of the file (`<FEW040 BKN075    >`).
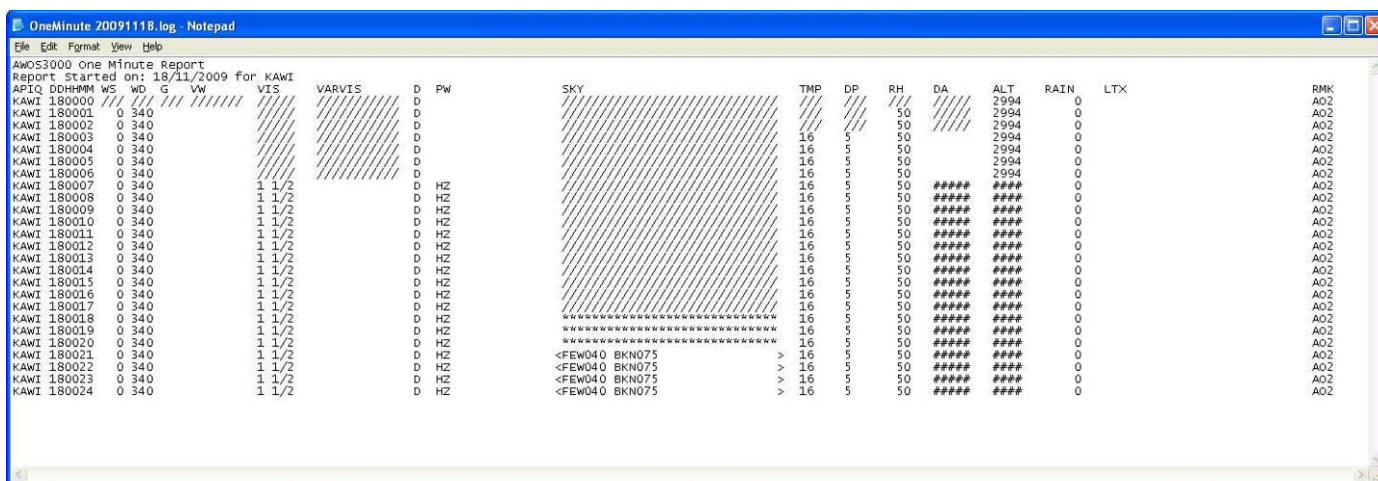
Figure 19. Log File Showing Special Characters

5.2 Winds

Wind speed and wind direction (Figure 20) are two-minute running averages calculated from sensor readings taken at one-second intervals. Wind direction is in degrees relative to magnetic North, wind speed values are in knots.

- The current wind direction is shown on a graphic dial that also shows the two-minute and ten-minute wind direction ranges along its rim.

- Wind direction is also shown numerically in the upper text box within the dial.

- Wind speed is shown in the lower text box within the dial.

- Wind gust and variable winds, when present, are shown below the dial.
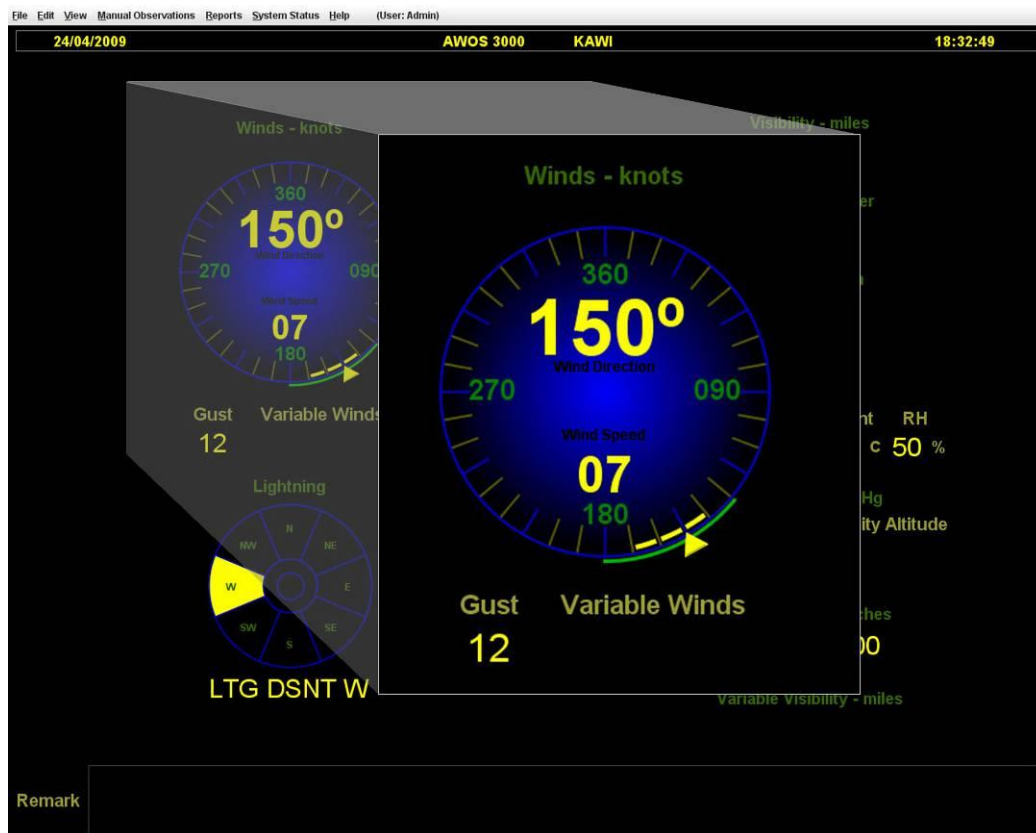
Figure 20. Winds Display

5.2.1 Wind Speed

The most recent wind speed value is shown in the lower text box within each dial, with values ranging from 0 knots to 120 knots. Wind speed is a two-minute average calculated by the CDP, updated every 5 seconds. When speed is less than three knots, the system indicates calm wind conditions.

5.2.2 Wind Direction

The most recent wind direction value is shown on a graphic 360° dial, and is displayed in the upper text box within the dial. Wind direction is a two-minute average calculated by the CDP, updated every 5 seconds. It is reported in **_degrees_**.

5.2.3 Wind Direction Range

The outer rim of the wind dial shows the two-minute and ten-minute wind direction range. The two-minute range is shown in yellow bars, and the ten-minute range is shown as a solid green band. The range increases or decreases in steps of 10°, with the outermost edges showing the wind direction extremes for the averaging period.

5.2.4 Wind Gust

Wind gusts are reported when the difference between the maximum and minimum wind speeds measured over the past 10 minutes is 10 knots or greater. The wind gust value, when present, is shown in a text box below the wind dial.

5.2.5 Variable Wind Direction

Variable Wind Direction, when present, is shown in a text box below the wind dial.

- Variable wind is reported when the wind direction varies around the two-minute average wind direction by 60 degrees or more, and the wind speed is more than 6 knots.

The displayed value shows the upper and lower ends of the direction variation, separated by a "V". As an example, a displayed value of **_040V130_** would mean the direction is varying between 40° and 130°.

The display will show simply **_VRB_** if:

- Wind speed is more than 6 knots and the direction is varying by more than 180°.

or

- Wind speed is 3–6 knots and the direction is varying by 60 degrees or more.

5.3 Visibility

Visibility (Figure 21) is a ten-minute average calculated each minute from sensor readings taken at ten-second intervals. It is reported in statute miles.

Figure 21. Visibility Display

5.4 Present Weather

The Present Weather field (Figure 22) shows the calculated present weather value. Present weather is derived from data for several parameters, including air temperature, dew point temperature, visibility, lightning (when available), and precipitation type and rate data from the present weather sensor.

Present weather data in this window is averaged over a ten-minute period by the present weather sensor and updated every 5 seconds. Present weather is reported in codes. Table 2 lists the codes reportable by the AWOS.

Figure 22. Present Weather Display

Table 2. Present Weather Codes

Guide to Present Weather Abbreviations

Intensity		Descriptor		Phenomena			
-	light	**BC***	patches	**BR**	mist	**IC***	ice crystals
(blank)	moderate	**BL***	blowing	**DS***	dust storm	**PL***	ice pellets
+	heavy	**DR***	low drifting	**DU***	widespread dust	**PO***	well-developed dust/sand whirls
VC	in vicinity	**FZ**	freezing	**DZ**	drizzle	**RA**	rain
		MI*	shallow	**FC***	funnel cloud, tornado, waterspout	**SA***	sand
		PR*	partial	**FG**	fog	**SG***	snow grains
		SH*	showers	**FU***	smoke	**SN**	snow
		TS	thunderstorm	**GR**	hail	**SQ***	squalls
				GS*	small hail/snow pellets	**SS***	sand storm
				HZ	haze	**VA***	volcanic ash

* These conditions are not automatically reported, and will only appear if entered as a manual observation.

Adapted from FMH-1 and FAA Order 7900.5B.

5.5 Sky Condition

The system reports sky condition (Figure 23) based on cloud cover measurements taken by the laser ceilometer. When clouds are present, the Sky Condition field shows a cloud cover description followed by the height of the cloud base. The type of cloud cover is represented by the following codes.

- **CLR/SKC**—sky clear (no clouds below 12,500 feet); CLR is displayed when the data are generated automatically from the ceilometer, SKC is displayed when the observation is entered manually via the *Manual Observation > Clouds* menu

- **FEW**—few (≥6% to 24% sky cover)

- **SCT**—scattered (≥25% to 49% sky cover)

- **BKN**—broken (≥50% to 87% sky cover)

- **OVC**—overcast (>87% sky cover)

- **VV**—obscured (cloud bases at surface/fog)

Cloud height is shown in **hundreds of feet** (12,000 feet, for example, is represented by "120"). Sky condition is estimated based on conditions directly above the ceilometer over a 30-minute sliding window.

Figure 23. Sky Condition Display

5.6 Temperature

The Temperature section displays the most recent reportable values for Air Temperature, Dew Point, and Relative Humidity (Figure 24).

5.6.1 Air Temperature

Air Temperature is a five-minute average calculated by the CDP from readings taken by the Temperature/Relative Humidity sensor at one-second intervals. It is reported in °C and is *updated every 5 seconds.* The reportable range is -40 to +60°C.

5.6.2 Dew Point

Dew Point temperature is a five-minute average calculated by the CDP from temperature and RH sensor readings taken at one-second intervals. It is reported in °C and is *updated every 5 seconds*. The reportable range is -40 to +60°C.

5.6.3 Relative Humidity

Relative Humidity is a two-minute average calculated by the CDP from RH sensor readings taken at one-second intervals. It is reported in *percent (0-100), and is updated every 5 seconds*.
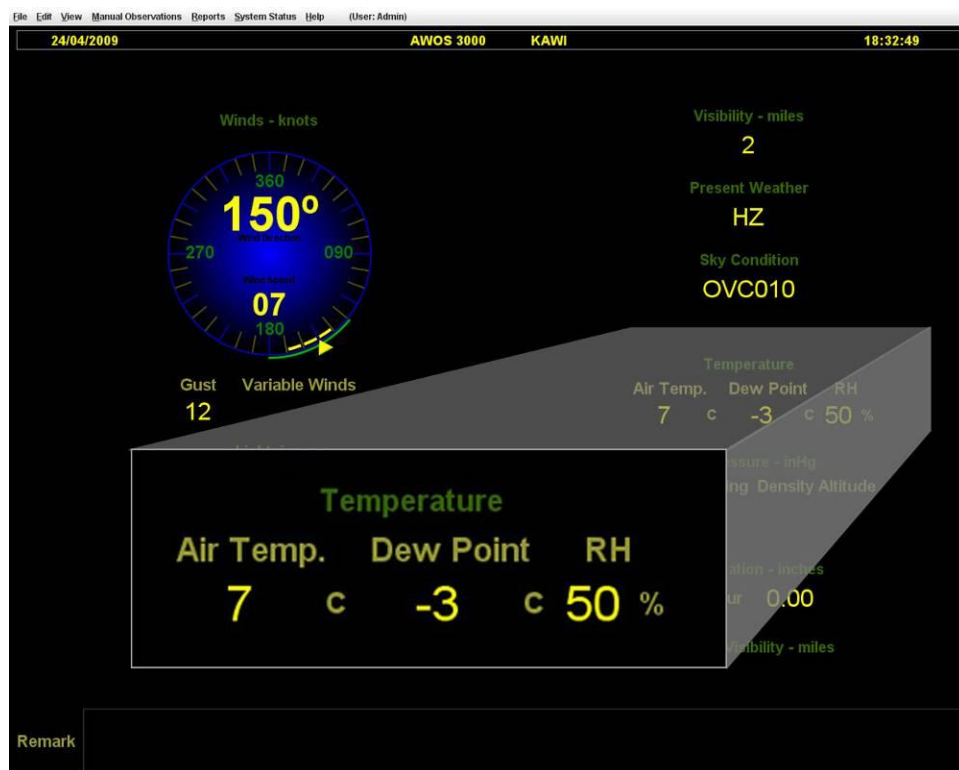
Figure 24. Temperature Display

5.7 Air Pressure

The Air Pressure section (Figure 25) displays the most recent reportable values for Altimeter Setting and, if applicable, Density Altitude. These values are updated every 5 seconds.

5.7.1 Altimeter Setting

Altimeter Setting is the pressure value to which the altimeter of an aircraft on the ground is set so that it will indicate the MSL (mean sea level) elevation of the airport. The two pressure sensors in the AWOS must agree to within 0.04 inHg and the temperature inside the sensor housing must be >-40°C and <60°C for altimeter setting to be reported. Units are inHg.

5.7.2 Density Altitude

Density Altitude is the altitude in the standard atmosphere where air density is equivalent to that of the airport. This is used by pilots to determine aircraft performance. Density altitude is not reported if it is less than 1000' above the field elevation.
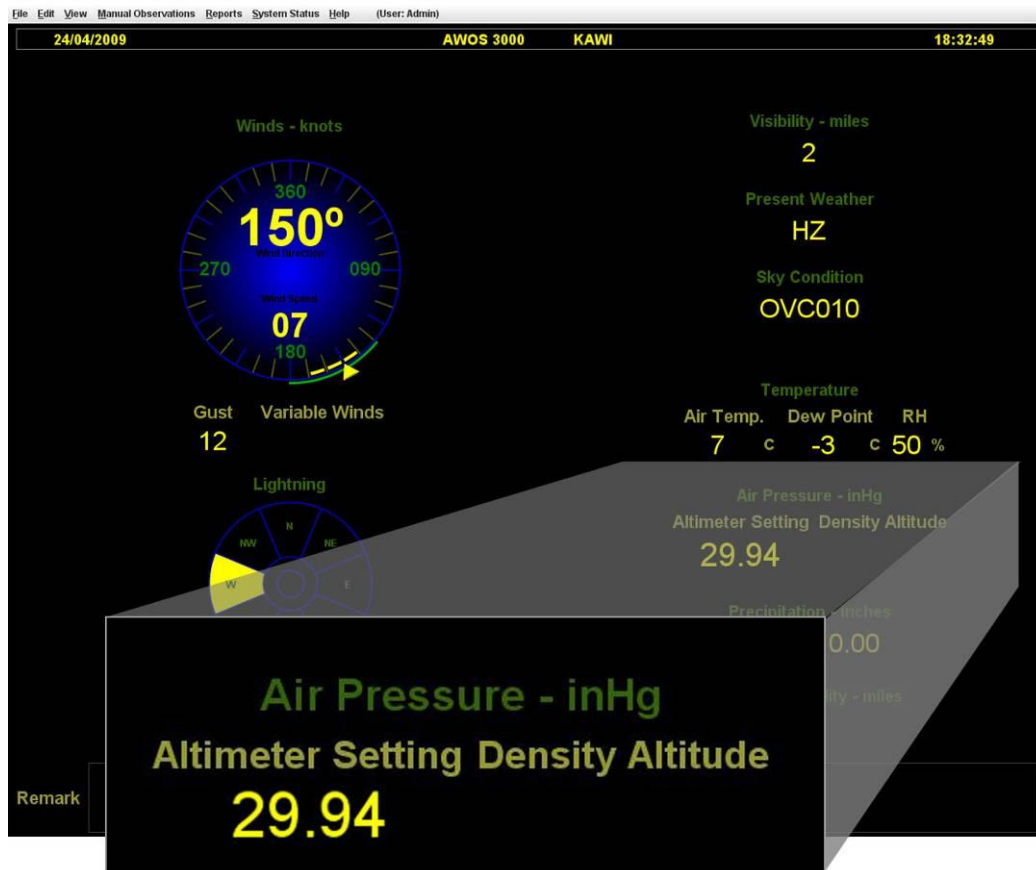
Figure 25. Air Pressure Display

5.8 Precipitation

The Precipitation section (Figure 26) shows the amount of precipitation measured during the past hour, counting from the beginning of the hour. (A measurement reported at 2:15, for example, would show the amount of precipitation measured over the past 15 minutes.) Precipitation is reported in inches and updated every 5 seconds. The precipitation value is reset to 0 at the top of every hour.

Figure 26. Precipitation Display

5.9 Variable Visibility

Variable Visibility (Figure 27) is determined based on an algorithm that analyzes the one-minute average visibility values. Each one-minute average is compared to the previous one-minute average, and if the difference is greater than 0.5 miles, a positive or negative change is logged. The algorithm then evaluates the past ten minutes worth of this logged data, noting each recorded change. If three or more changes have been logged over the ten minute period, along with two or more sign changes, variable visibility is reported. Otherwise, the field is left blank.
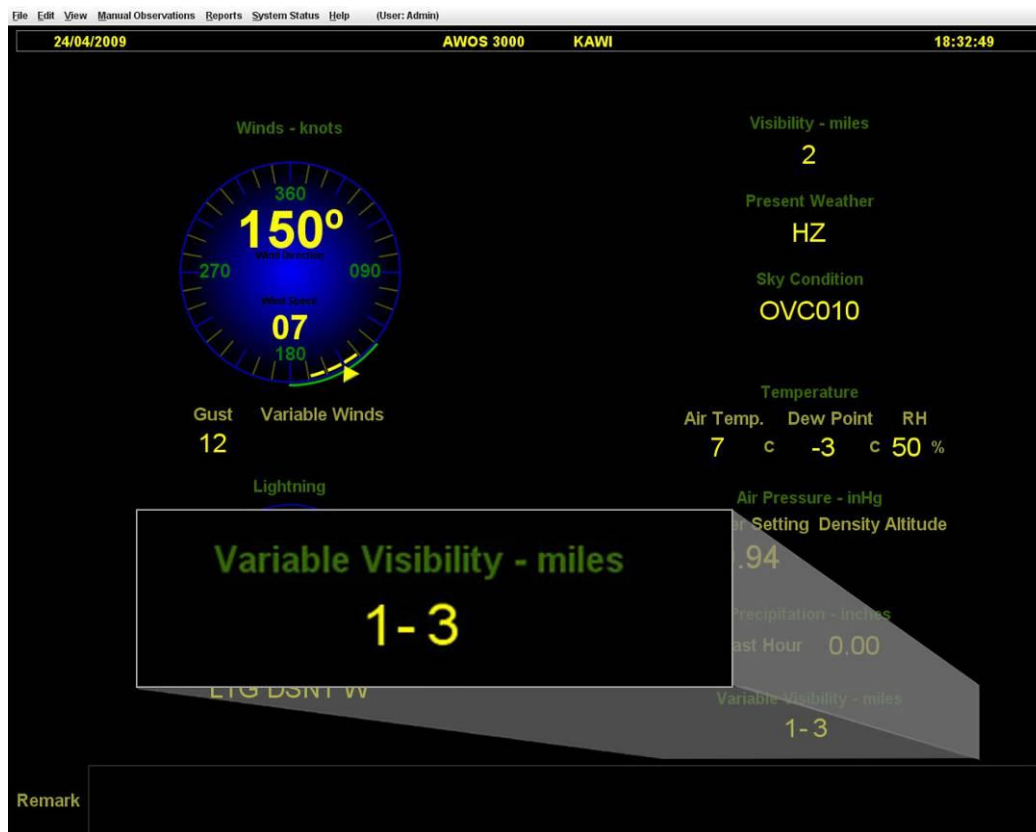
Figure 27. Variable Visibility Display

5.10 Lightning

When a Model 6500 Thunderstorm Detector is installed, lightning data is displayed on a graphic dial (Figure 28) and in text form below the dial.

Figure 28. Lightning Display

The Lightning dial is divided into octants, which indicate the direction of the lightning, and into two concentric areas (center circle and secondary ring) that indicate distance from the airport.

- If strikes are detected within 0–5 nautical miles, the center circle on the dial will be illuminated. The text display will show "TS at Airport". This will be voiced in the AWOS voice message as "Thunderstorm at the airport".

- If strikes are within 5–10 nautical miles, the secondary ring on the dial will be illuminated. The text display will show "Thunderstorm in Vicinity". This will be voiced in the AWOS voice message as "Thunderstorm in the vicinity".

- If strikes are detected within 10–30 nautical miles, one or more direction octants will be illuminated showing the direction in which lightning has been detected. The text display

will show "LTG DSNT" followed by the direction abbreviation. The AWOS voice message will report "Lightning" followed by the direction.

- If strikes are reported in 4 or more non-contiguous quadrants, the display will show "ALQDS". This will be voiced in the AWOS voice message as "Lightning all quadrants".

- If no strikes are detected, no part of the dial will be illuminated. The text display will be blank, and no lightning data will be included in the AWOS voice message.
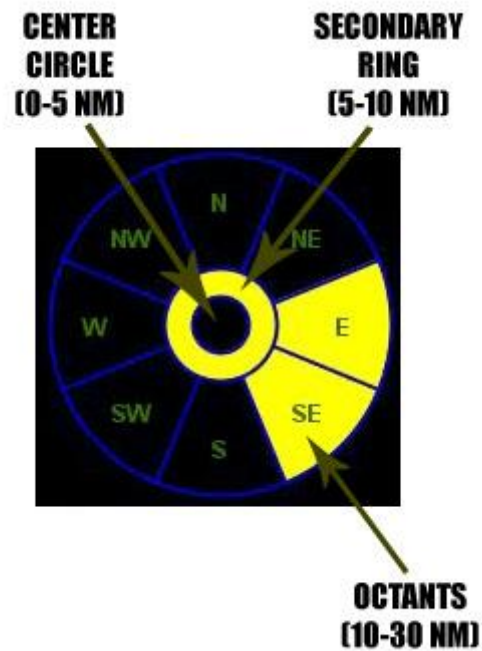
Figure 29. Lightning Dial

5.11 Remark

The Remark panel (Figure 30) shows any active weather remarks entered by an operator. Weather remarks are entered using the *Reports > METAR Remark* menu option.

Figure 30. Displaying Remarks
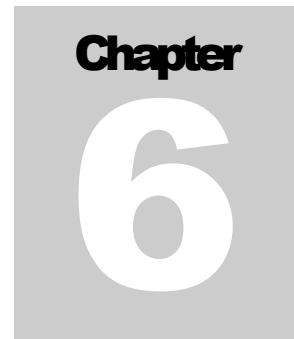
6. Navigating the Menus

The menu categories on the menu bar at the top of the display each present a drop-down menu when clicked. Where keyboard shortcuts are available, they are noted in the text. The functions accessible from each of the menus is discussed in detail in the following chapters.

Chapter

7
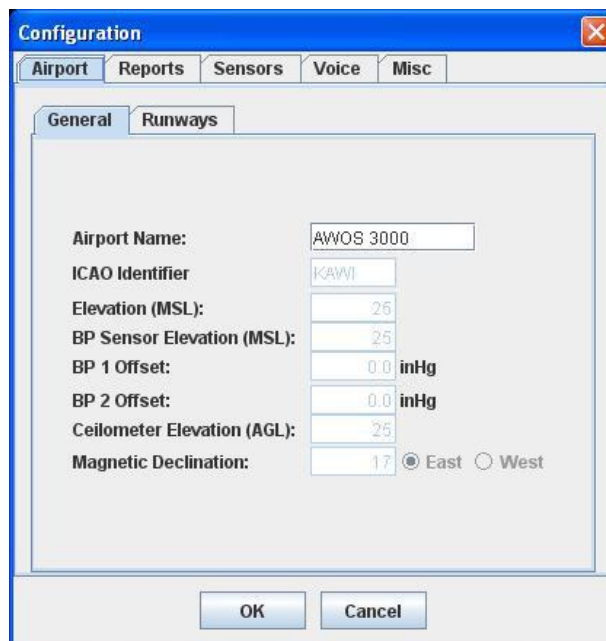
7. Restricted Functions

Certain menu functions are available only to technicians equipped with the AWOS Security Key CD. These functions are all found on the *Edit* menu, and are described below.

7.1 Edit Menu

7.1.1 Configuration > Airport > General Tab

The **Airport** tab (Figure 31) contains two sub-tabs: *General* and *Runways*. The *Runways* tab is available to all users. The *General* tab contains a number of options unique to the airport location.

Figure 31. Configuration General Tab

Table 3 provides further detail on the parameters displayed on the "General" tab.

<div align="center">

Table 3. Parameters on the General Tab

</div>

General	
Airport Name	The name entered here will be shown at the top of the display. Affects the displayed name only; voice output is not affected.
ICAO Identifier	The four-letter ICAO airport identifier or three-digit airport identifier
Elevation (MSL)	The elevation of the airport above mean sea level
BP Sensor Elevation (MSL)	The MSL elevation of the barometric pressure sensor
BP 1 Offset	The offset value for barometric pressure sensor 1; this is a sensor-specific constant that varies from sensor to sensor
BP 2 Offset	The offset value for barometric pressure sensor 2; this is a sensor-specific constant that varies from sensor to sensor
Ceilometer Elevation (AGL)	When the ceilometer is not located at the runway or pad, the difference in elevation between the ceilometer location and the landing surface is entered here. If the ceilometer is installed at a location higher in elevation than the landing surface, the value entered is positive; if the ceilometer is installed at a location lower in elevation than the landing surface, the value entered is negative.
Magnetic Declination	The magnetic declination of the airport; used to convert between True North and Magnetic North values

7.1.1.1 Barometric Pressure Offsets

If the Model 7150 or Model 7190 Dual Digital Barometer sensor unit is replaced, it will be necessary to update the BP 1 and BP 2 offsets shown in Figure 31 and described in Table 3.

A keypad and LCD display screen are located inside the DCP enclosure, and are used to view sensor data and perform maintenance checks. Use the * and # keys on the keypad to move through the screens—press the # key to move to a higher numbered screen, or press the * key to move to a lower numbered screen. Screen 8 shows the readings for the two pressure sensors using inHg units. A value of 99.999 indicates missing data.

The barometric pressure is measured using a Setra Systems Model 370 Ultra-High Accuracy Setraceram™ pressure standard. Note the difference in readings for each Model 7150 or Model 7190 sensor displayed on the DCP screen from the pressure standard reading using inHg units. If the readings differ by more than 0.05 inHg, replace the sensor. Otherwise, access the *Airport > General* tab, enter the two offsets, and click **OK** to save them. An offset will be "negative" if the sensor reading is greater than the reference pressure standard.

7.1.2 Configuration > Sensors Tab

Use the **Sensors** tab (Figure 32) to specify the type of AWOS installed and the sensors used. The specific type of sensor for a given parameter need not be specified (for example ultrasonic wind vs. cup and vane); the AWOS software determines this internally.

The selection made here determines what data modules appear on the display. If a sensor is unchecked on this list, it will not appear on the display, will not be mentioned in the voice output, and will be shown as not installed (indicated by "*") in data logs.

Table 4 provides further definition of the fields found on the **Sensors** tab.
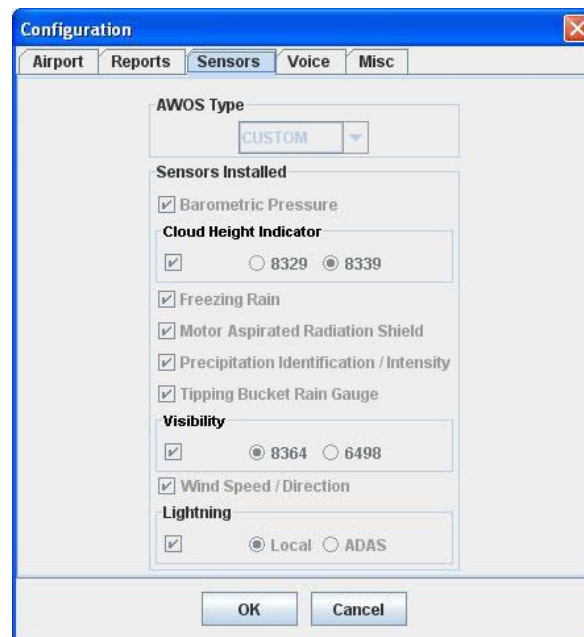
Figure 32. Sensors Configuration Tab

Table 4. Sensors Tab Fields

Sensors	
AWOS Type	Select the type of AWOS installed from the dropdown list. Selecting a specific type will automatically check and uncheck the sensors associated with that type. If your system varies from one of the pre-defined AWOS types, select CUSTOM from the list and select the installed sensors manually.
Sensors Installed	Sensors are automatically selected in this panel when an **AWOS Type** is selected above. If a custom system is used, select CUSTOM for **AWOS Type** and select the installed sensors manually from this list.
Lightning	Check the **Lightning** option to add the lightning dial and text display to the Tower View. Select **Local** to display the data from the AWOS Thunderstorm/ Lightning sensor, or select ADAS to display data are from the ADAS network. Only the **Local** option is supported at this time.

7.1.3 Alarm Configuration Menu

(Keyboard shortcut Alt+e then a)

Sensor alarms can be set to alert the operator when a sensor is reporting values that are out of range ("Range Alarms") or that have remained unchanged for an extended period ("Static Alarms").

The *Alarm Configuration* menu (Figure 33) contains tabs for each sensor for which alarms can be set. Each tab contains a set of fields (identical for each tab) that are separated into *Range* and *Static* panels.

- The *Range* panel contains the minimum and maximum values that the sensor is able to report. These values are sensor-specific. If either of these values is exceeded, an alarm is triggered and the data are reported as missing (invalid).

- The fields within the *Static* panel are used to set the range, number of samples, and time period over which values are considered in determining whether a sensor's output is "static" (unchanged over an extended period) or the data are missing (invalid).
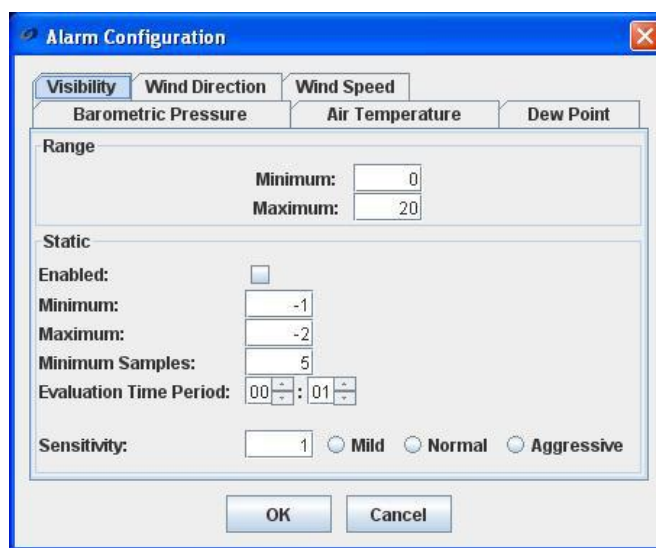
Figure 33. Alarm Configuration Screen

Note that the minimum shown for the *Static* panel on the sample screen in Figure 33 is "-1" and the maximum shown is "-2". This is intentional to make sure that static input checking is not used by default in case the *Enabled* box is checked.

The sensitivity entry does not affect calculations, but only influences whether an alarm is generated.

The next section discusses the *Alarm Configuration* menu settings.

7.1.3.1 Setting Range Alarm Values

1. Click the appropriate tab at the top of the screen to select a sensor.

2. Enter the minimum value the sensor is capable of reporting in the **minimum** field within the *Range* panel. (Refer to the sensor specifications for this value.)

    Example: For a Model 2040 Ultrasonic Wind Sensor, you would enter a **minimum** *value of 0 on the* **Wind Speed** *tab, since 0 knots is the minimum value the sensor is capable of reporting.*

3. Enter the maximum value the sensor is capable of reporting in the **maximum** field within the *Range* panel. (Refer to the sensor specifications for this value.)

    Example: For a Model 2040 Ultrasonic Wind Sensor, you would enter a **maximum** *value of 130, since130 knots is the specified top end of the sensor's reporting range.*

7.1.3.2 Setting Static Alarm Values

Static Alarms are determined by calculating the standard deviation for a set of data values. The fields in the *Static* panel are used to specify the data set, including the range of values to be considered, the minimum number of samples required, and the time period covered. An alarm is triggered if the standard deviation for the specified data set is less than or equal to the sensitivity setting.

1. Click the **Enabled** checkbox to enable static alarms for the sensor. To disable static alarms, click the **Enabled** checkbox again.

2. Enter the lowest reported value to be considered in the data set in the **minimum** field.

    Example: For wind speed, a reasonable value would be 1. This would remove a value of 0 from consideration, which is commonly reported for long periods under calm conditions.

3. Enter the highest value to be considered in the data set in the **maximum** field.

    Example: For temperature, a reasonable value would be +60° C, the specified maximum reportable temperature for the sensor.

4. Enter the **minimum number of samples** required for a data set.

5. Enter the **evaluation time period** in hours and minutes. This is a moving window that includes the most recent group of values recorded over the specified period of time. As a new value is added to the data set, the oldest value (now falling outside the time period) is discarded.

6. Select a **Sensitivity** setting of *Mild, Normal,* or *Aggressive* (a more aggressive setting will cause more alarms to be triggered). Each of these settings corresponds to a numeric value that is automatically entered into the **Sensitivity** text box when a setting is selected. You can also enter a custom value in the text box.

7. Repeat these steps for each sensor tab.

When done, click **OK** to save the settings, or click **Cancel** to discard any changes made and close the *Alarm Configuration* window.

7.1.4 Configuration > Voice Tab

The options in the **Test** panel at the bottom of the *Voice* tab are used by technicians to test the AWOS voice output.
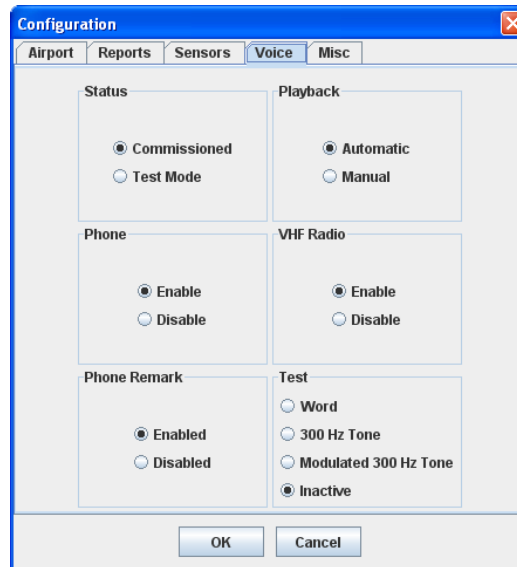
Figure 34. Voice Configuration Tab

- The *Word* option broadcasts words from the AWOS voice dictionary. This option is used in testing by AWI technicians.

- The *300 kHz Tone* and *Modulated 300 kHz Tone* options transmit successive 30-second 300 kHz tones, with short pauses between the tones. This option is used to set the modulation for the voice output.

- The *Inactive* option turns off the test output. This is the setting used during normal operation.

7.1.5 Voice Remark

The *Voice Remark* option described in Section 9.8 lets users to record up to two 90-second voice remarks to be appended to the outgoing AWOS voice message.

Note: VHF radio and telephone voice outputs are suspended while the Voice Remark window is open.

The administrator also has access to the **Admin Remark** tab shown in Figure 35, which you click on to record an administrative remark such as the airport name to be used at the beginning of the voice message.
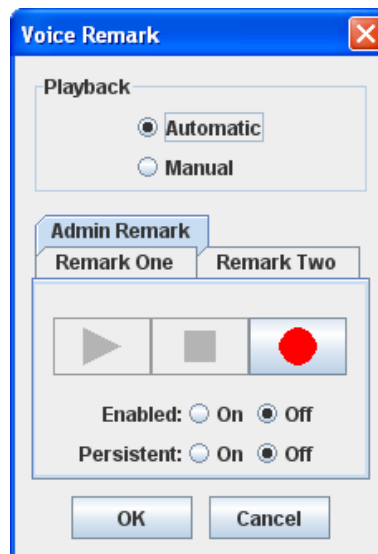
Figure 35. Administrator Voice Remark Screen

7.1.5.1 Recording the Airport Name

Note that you must be logged in as the administrator or as a user with *Configuration* privileges (configured by the administrator via *Edit > Group Authorizations*) to access the **Airport** tab to record the airport name to be used at the beginning of the voice message.

To record the airport name to be used in the outgoing voice message:

1. Click the **Airport** tab.
2. Click the **record** button ![record] to begin recording.
3. Speak the airport name clearly into the workstation or CDP microphone.
4. When done, click the **stop** button ![stop].

Click **OK** to save the recording, or click **Cancel** to exit the Voice Remark screen without saving the recording.

The **Enabled** and **Persistent** options are the same as those described in Section 9.8 for other users.

Chapter

8

8. File Menu

(Keyboard shortcut Alt + f)

The *File* menu (Figure 36) contains options for logging in and out, retrieving historical data, printing, and window control.

File
Login ...
Logout
Historical Data ...
Printer Setup ...
Minimize
Exit

Figure 36. File Menu

8.1 Login

(Keyboard shortcut Alt+f then i)

The ***Login*** option is used to log in to the system as a User. Each User has access to specific screens and functions, as set by the administrator through the ***User Authorizations*** and ***Group Authorizations*** options on the *Edit* menu. The use of these options is explained in detail in the next chapter.

- To log in, select a User from the pull-down menu.
- Enter your password in the **Password** field, then click **OK**.
- The User name under which you are logged in will be shown in parentheses at the top of the screen, and all applicable menu options will now be available.

8.2 Logout

(Keyboard shortcut Alt+f then o)

To log out of the current group, click **Logout**. All menu options requiring login will be grayed out.

8.3 Historical Data

(Keyboard shortcut Alt+f then h)

The *Historical Data* option lets you call up a range of archived data for viewing or saving to a CD. Once saved, the data can be imported into a spreadsheet on another PC as a comma-delimited text file, which allows the data to be graphed and analyzed. Data importing and analysis cannot be performed on the AWOS CDP.

The data type and date range to retrieve are specified using the *Historical Data Selection* screen shown in Figure 37.
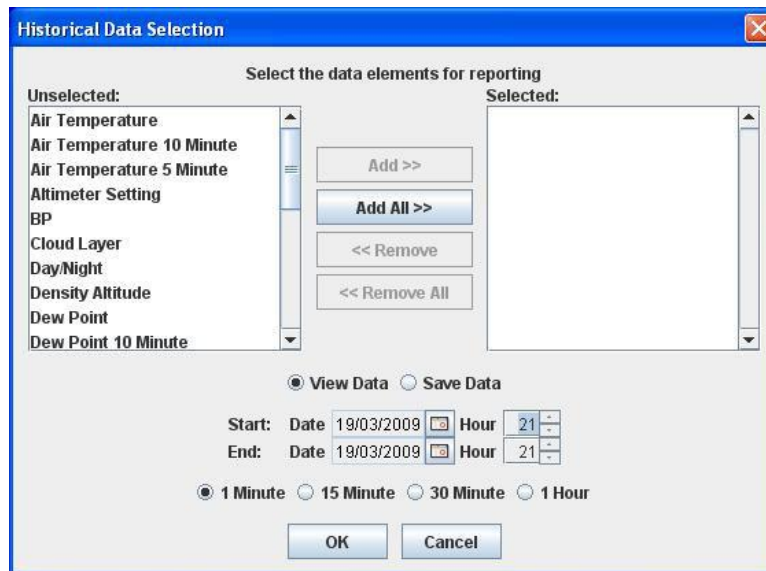
Figure 37. Historical Data Selection Screen

The following steps describe how to retrieve a range of data.

1. Select the data type from the left *Unselected* panel, then click **Add>>** to add it to the *Selected* panel on the right.

    - To select multiple data types from the list, hold down the **Ctrl** key while clicking.

    - To select a group of data types adjacent to one another on the list, click the first data type, then hold down the **Shift** key while clicking the last data type.

    - To add all the data types on the list, click **Add All>>**.

2. Choose whether you want to view the data or save it to a file.

    - Select **View Data** to have the selected data brought up in a display window (Figure 38) once selection is complete.

    - Select **Save Data** to save the selected data to a CD once selection is complete.

Figure 38. View Historical Data Example

3. Set the range for the data to be retrieved by entering the date and time of the first file to retrieve in the **Start** window and the date and time of the last file in the **End** window. To change the date, click the calendar icon to call up a monthly calendar, then click the appropriate date. To change the time, click within the Hour field then click the up or down arrow to change the value.

4. Select the sampling interval: **1 Minute**, **15 Minute**, **30 Minute**, or **1 Hour**. This determines the frequency of data points within the selected date and time range. If you select **15 Minute**, for instance, data values will be retrieved at 15-minute intervals.

5. Click **OK** to retrieve the data. Or click **Cancel** to close the *Historical Data Selection* screen without retrieving any data.

The CD drive is just below the monitor in the CDP rack enclosure.

Only data representing a small number of days can fit on one CD if all the sensors are selected, but considerably more data can be stored from just one sensor. The CDP will show an error message if you attempt to store more than a CD can handle, and so you can iteratively reduce the amount of data by selecting fewer logs, a shorter time length, or a reduced reporting frequency if you get the error message.

8.4 Printer Setup

(Keyboard shortcut Alt+f then s)

The *Printer Setup* option lets you set up the printer for automatic printing, check printer status, send a test page, and send a "TOP OF FORM" command. Figure 39 shows the **Printer Setup** dialog. The default print setting is Automatic Printing, 1 Minute Frequency.
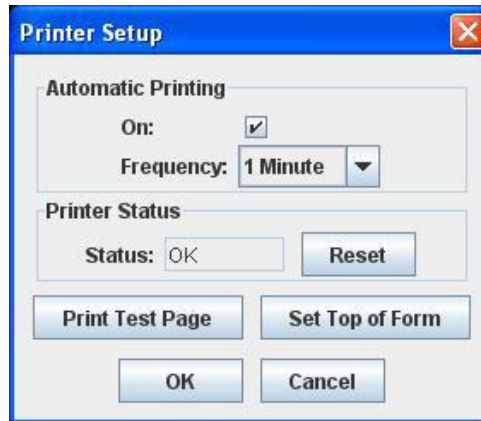
Figure 39. Printer Setup Dialog

8.4.1 Automatic Printing

AWOS data can be sent to the printer automatically at a specified interval using the *Automatic Printing* option.

- Select the **On** checkbox to turn automatic printing on.
- Click the checkbox again to toggle the setting off.

Any time the printer is disconnected, the data will continue to buffer when Automatic Printing is turned on. When the printer is reconnected, the data in the buffer will start to print. If there is no need to print out the buffered data when the printer is reconnected, remember to uncheck the checkbox to disable automatic printing before disconnecting the printer.

8.4.2 Printer Status

The *Printer Status* field shows the current status of a connected printer. This should normally read **OK**. If the status reads **Error**, follow the steps below.

1. Check the printer and fix any problems (jammed paper, etc.).
2. Click the **Reset** button to reset the status to **OK**.
3. At the printer, position the paper correctly, then click **Set Top of Form**.

8.4.3 Print Test Page

Click **Print Test Page** to send test pages to the printer to check that the printer is operating properly.

8.4.4 Set Top of Form

Click the **Set Top of Form** button to tell the software that the paper is positioned correctly and is ready for printing. This should be performed whenever paper is changed, repositioned, or following the clearing of an error.

8.5 Minimize

(Keyboard shortcut Alt+f then m)

Click the *Minimize* option to minimize the display. The software will continue running when minimized. To restore the display to full screen, click the **AWI AWOS** icon on the application toolbar at the bottom of the screen.

8.6 Exit

(Keyboard shortcut Alt+f then x)

Click the *Exit* option to close the AWOS 3000 display. The AWOS core software will continue to run, with weather data being collected, processed, and logged, and VHF radio and voice modem output continuing uninterrupted. After exiting, the user will have limited access to the underlying operating system. They will be able to view system files but not edit them; they will not be able to stop system services.

Chapter

9

9. Edit Menu

(Keyboard shortcut Alt + e)

The *Edit* menu (Figure 40) contains options for setting up group and user authorizations, configuring the display and alarm settings, turning AWOS sensor reporting on or off, handling archive data, and entering voice remarks.

Figure 40. The Edit Menu

Access to some configuration functions requires the CD security key, which is available only to certified technicians. Refer to Chapter 2 for explanations of those functions.

9.1 Group and User Authorizations

The AWOS display software is highly configurable through a series of user menus. Often, though, configuration changes may best be restricted to authorized users. The Group and User structure of the software allows permission to be allocated as required to control access and maintain the integrity of system operations. Authorization menus are generally only available to Administrators, though those permissions can be given to other groups as well.

- *Group Authorizations* allow administrative functions to be enabled or disabled, new groups to be created, and access to the three data views to be assigned.

- *User Authorizations* grant group membership to individual users. A user can belong to one or more groups. On logging in, the user will be granted access to all the functions allowed for each group in which he has membership.

- Authorization changes take effect immediately on exiting a configuration dialog and returning to the main display.

- The "Admin" user is the only user entry required by the system and cannot be deleted.

In the explanations used in this section, the group and user names are only examples (with the exception of the "Admin" user). Remember that Users and Groups are distinct. In Figure 44, for example, the user "Admin" is not synonymous with the group "Administrators", though the names are similar. With the settings as shown in Figure 44, the user "Admin" and group "Administrators" do have the same privileges, since only "Group Administrators" is checked. If "Group Operators" was also checked, however, "Admin" would have all the privileges associated with the "Operators" group along with those associated with the "Administrators" group.

9.2 Group Authorizations

(Keyboard shortcut Alt+e then g)

The *Group Authorizations...* option allows administrators to set group permissions. *Note: To view the entire list, you may need to resize the window or use the scroll bars.*

- To configure group permissions, log on as an authorized user with Admin rights and select *Edit > Group Authorizations* to call up the screen shown in Figure 41.
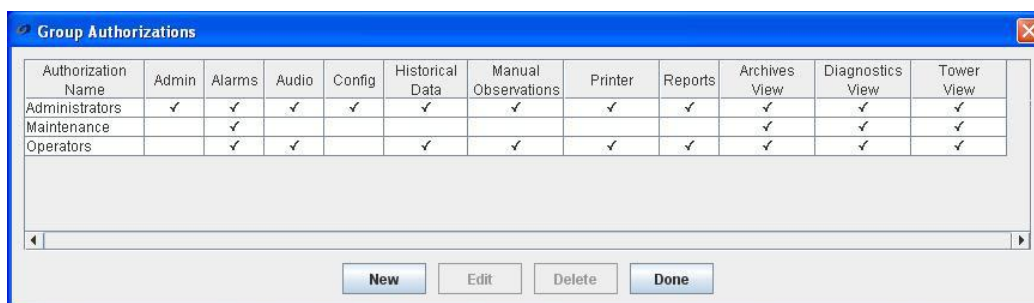
Figure 41. Group Authorizations Screen
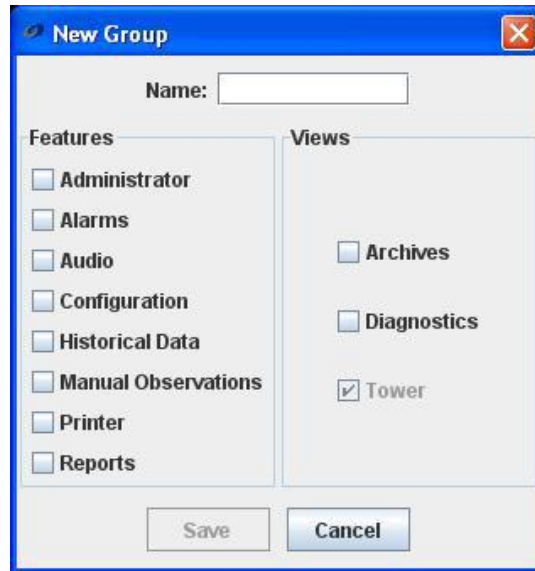
The Group Authorizations screen lists all current groups and the authorized features and display views available to each. The **Authorization Name** shows the name of the group, followed by a series of checkboxes that shows the functions a group is authorized to access. A function is accessible when it is checked. Table 5 explains each of the functions.

Table 5. Group Authorization Details

Function	When Checked
Admin	Gives the group administrative privileges, including Group and User Authorization
Alarms	Lets the group acknowledge and disable alarms (*System Status* menu)
Audio	Lets the group record voice remarks (*Edit > Voice Remarks*)
Config	Lets the group change configuration settings and configure alarms (*Edit > Configuration*)
Historical Data	Lets the group view and retrieve data logs (*File > Historical Data*)
Manual Observations	Lets the group enter manual observations (*Manual Observations* menu)
Printer	Lets the group control printer operation
Reports	Lets the group enter METAR remarks
Archives View	Lets the group select the Archives view from the *View* menu
Diagnostics View	Lets the group select the Diagnostics view from the *View* menu
Tower View	Always on

9.2.1 Adding a Group

To add a new group, click the **New** button at the bottom of the screen. The screen shown in Figure 42 will be displayed.

Figure 42. New Group Screen

- Enter a name for the group.
- Select all the features from the **Features** panel that you want the group to have access to.
- Select all the views from the **Views** panel that you want the group to have access to.
- Click **Save** to add the group.
- Click **Cancel** to return to the Group Authorizations screen without adding the group.

9.2.2 Editing a Group

To edit a group's authorizations, highlight a group on the list and click the **Edit** button at the bottom of the screen. The screen shown in Figure 43 will be displayed.
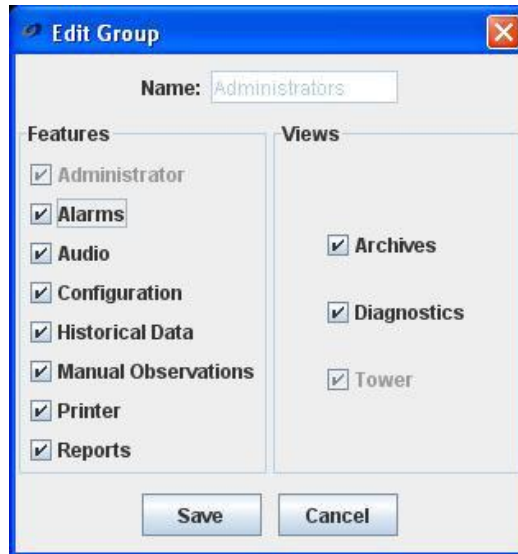
Figure 43. Edit Group Screen

- Check or uncheck **Features** and **Views** to enable (check) or disable (uncheck) access.
- Click **Save** to save the changes.
- Click **Cancel** to return to the Group Authorizations screen without saving the changes.

9.2.3 Deleting a Group

To delete a group, highlight the group name on the Group Authorizations screen and click the **Delete** button at the bottom of the screen. The group will be deleted immediately. *Note: You cannot delete a group that has a user associated with it. The **Administrator** group cannot be deleted.*

9.3 User Authorizations

(Keyboard shortcut Alt+e then u)

The ***User Authorizations...*** option allows authorized users to define new users and associate them with the appropriate groups. *Note: To view the entire list, you may need to resize the window or use the scroll bars.*

- To configure user permissions, log on as an authorized user with Admin rights and select *Edit > <u>User Authorizations</u>* to call up the screen shown in Figure 44.
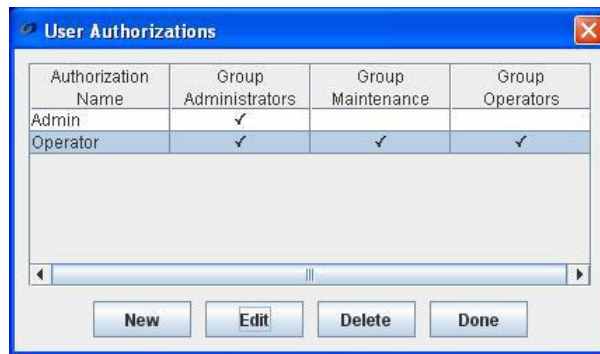
Figure 44. User Authorizations Screen

The User Authorizations screen lists all current users along the left side and all existing groups along the top. The **Authorization Name** shows the name of the user, followed by a checkbox for each available group. A checkmark beneath a group indicates that the user is a member of that group with access to all the features associated with the group.

9.3.1 Adding a User

To add a new user, click the **New** button at the bottom of the screen. The screen shown in Figure 45 will be displayed.

Figure 45. New User Screen

- Enter a name for the user.
- Enter a password for the user. Any letter and/or number combination can be used. No password strength checking is built into the system, so it is the user's responsibility to choose a secure password.
- To confirm the password, re-enter it in the **Retype Password** field.
- Select each of the groups in the **Groups** panel to which the user will belong.
- Click **Save** to add the user.
- Click **Cancel** to return to the User Authorizations screen without adding the user.

9.3.2 Editing a User

To change a user's password or change the groups the user belongs to, highlight the user's name on the list and click the **Edit** button at the bottom of the screen. A screen similar to that shown in Figure 46 will be displayed.

Figure 46. Edit User Screen

- To change the user's password, enter a new password in the **Password** field.
- To confirm the password, re-enter it in the **Retype Password** field.
- Check or uncheck groups in the **Groups** panel to set the groups to which the user will belong.
- Click **Save** to save the changes.
- Click **Cancel** to return to the User Authorizations screen without saving the changes.

9.3.3 Deleting a User
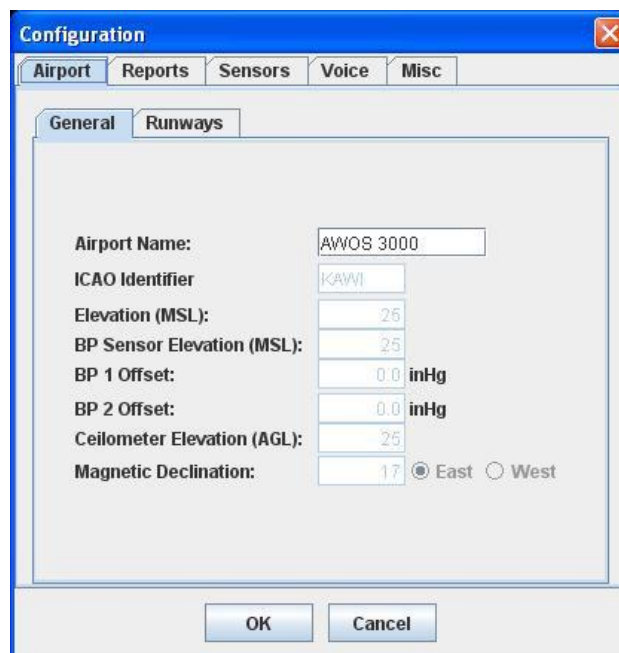
To delete a user, highlight the user's name on the User Authorizations screen and click the **Delete** button at the bottom of the screen. The user will be deleted immediately.

9.4 Configuration

(Keyboard shortcut Alt+e then c)

When you select **Configuration** from the *Edit* menu, the main configuration screen (Figure 47) appears. The available configuration options are grouped under tabs according to the part of the system they affect:

> ➢ **Airport**
> ➢ **Reports**
> ➢ **Sensors**
> ➢ **Voice**
> ➢ **Misc**

- To access a configuration category, click the appropriate tab at the top of the screen.

- Most categories also provide secondary tabs that group similar options under a common heading. The **Airport** tab, for example, is divided into *General* settings and *Runway* settings.
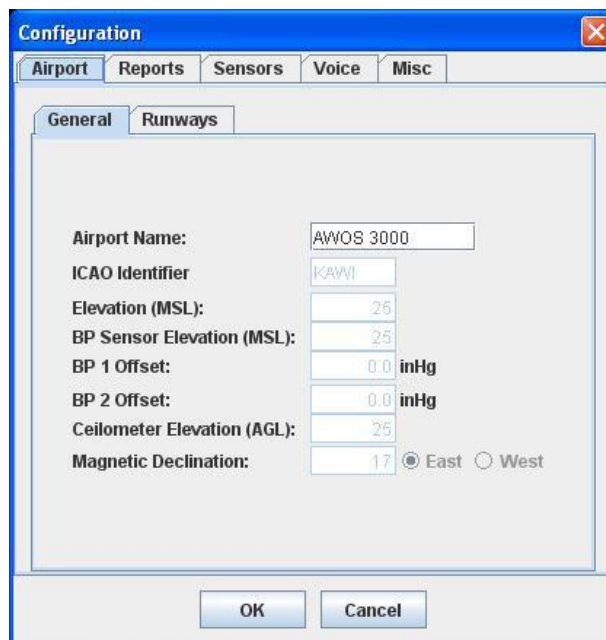
Figure 47. Configuration Screen

9.4.1 Airport Tab

The **Airport** tab (Figure 48) contains two sub-tabs: *General* and *Runways*.

9.4.1.1 General

The *Airport > General* tab contains a number of options unique to the airport location. Only the Airport Name is available for general user input. All other settings require the CD security key. Refer to Section 7.1.1 for details on those options.

Figure 48. Configuration General Tab

9.4.1.2 Runways

The *Airport > Runways* tab (Figure 49) contains a single field for specifying the number of the runway where the AWOS is installed.
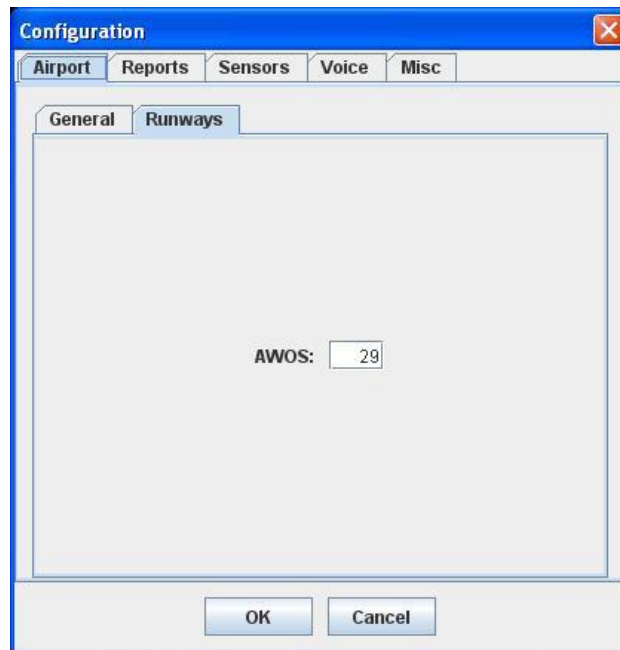
Figure 49. Runways Tab

Table 6. Parameters on the Runways Tab

Runways	
AWOS	Enter the number/designation of the runway associated with the AWOS. The value can consist of a 2-digit number from 1–36, followed by an optional designator (R or L, for example). Up to four text characters can be entered in place of numeric values for sites such as helipads that do not have runway designations.

9.4.2 Reports Tab

The **Reports** tab lets you specify parameters for METAR scheduling and NADIN configuration.

9.4.2.1 METAR Tab

The **METAR** tab (Figure 50) lets you specify the scheduling of METAR report transmissions. The available reporting intervals are:

- 5 minutes
- 10 minutes
- 15 minutes
- 20 minutes

This value can be changed by the site operator; the CD key is not required. The default setting is 5 minutes. *Note that any changes to the METAR reporting interval must be coordinated with the FAA.*

Figure 50. METAR Configuration Tab

9.4.2.2 NADIN Tab

The **NADIN** tab (Figure 51) lets you set NADIN to OFF or ON.

- Set to OFF when NADIN is not installed or to disable NADIN.

- Set to ON to enable NADIN.

Figure 51. NADIN Tab

9.4.3 Sensors Tab

Access to the options found on the **Sensors** tab requires the CD security key. Section 7.1.2 provides the details.

9.4.4 Voice Tab

The **Voice Configuration** tab (Figure 52) lets you set the status of the AWOS voice message, the playback mode, and enabling or disabling the VHF radio and phone output.
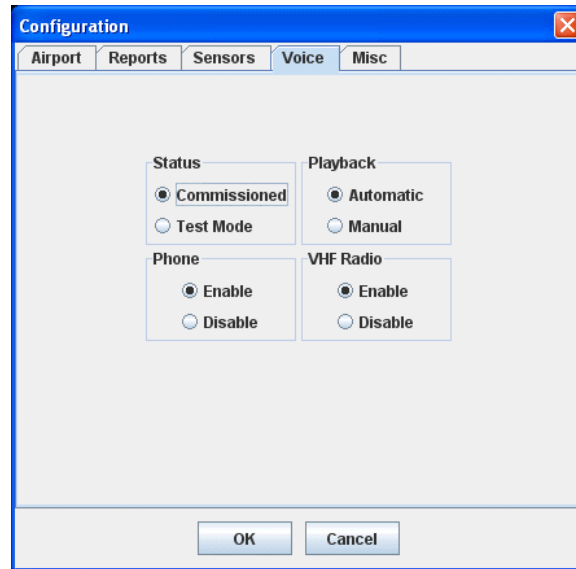
Figure 52. Voice Configuration Tab

9.4.4.1 Status

The **Status** panel of the *Voice* tab offers two status options.

- Select **Commissioned** for a system that has been commissioned and is in normal operation.
- Select **Test Mode** to transmit a "test" notice in the outgoing voice message. This option is used prior to commissioning and during maintenance.

9.4.4.2 Playback Mode

The **Playback** panel lets you select between two playback modes.

- In **Automatic** mode the outgoing voice message includes all available AWOS weather data in addition to any manually recorded voice remarks.
- In **Manual** mode, all automatically generated AWOS weather data is excluded from the voice output, and only manually recorded voice remarks are output. This mode should not be used for weather data, since the voice remark will not expire until playback mode is returned to **Automatic**.

9.4.4.3 Enabling Phone Output

The **Phone** option at the bottom of the *Voice* tab lets you enable or disable voice output over a phone line. This might be used when, for example, a phone line is to be used for RMM rather than voice output. In that case, **Phone** would be set to **Disable**.

Set to *Enable* for normal operation. Set to *Disable* to suspend phone output.

9.4.4.4 Enabling VHF Radio Output

The **VHF Radio** option at the bottom of the *Voice* tab lets you enable or disable voice output over the ground-to-air VHF radio. This might be used when, for example, the VHF radio is malfunctioning. In that case, **VHF Radio** would be set to **Disable**.

Set to *Enable* for normal operation. Set to *Disable* to suspend VHF output. When using the ATIS/AWOS switch, this should normally be set to *Enable*.

9.4.4.5 Voice Test Mode

Access to the options found on the **Voice** tab requires the CD security key. Section 7.1.4 describes the details.

9.4.5 Misc Tab

The **Misc** tab lets you specify the number of days to retain logs in the system before deleting them, set the user timeout period, and control the system's time source (GPS or computer).

9.4.5.1 General Tab

The **General** tab (Figure 53) lets you enter the number of days to retain logs, and to set the default time period for automatically logging out a user.

- In the *Number of Days to Keep Logs* text box, enter the number of days the system should maintain log files before overwriting them. The value can be anywhere in the range of 4 days to 9999 days. (Note: Saved logs will be retained regardless of the value entered here.)

- In the *Default User Timeout* text box, enter the number of minutes of inactivity before a logged-in user is automatically logged out. If a user is logged in, once this time period has elapsed (with no keyboard or mouse activity detected), the AWOS display will remain visible, but menu options requiring user login will be grayed out.

- In the *Pin for voice remarks over phone* text box, enter a 4-digit numeric PIN. The PIN number is used to enable/disable or add voice remarks via telephone. Although the PIN may be fewer than 4 numeric digits, four digits ar recommended for maximum security.
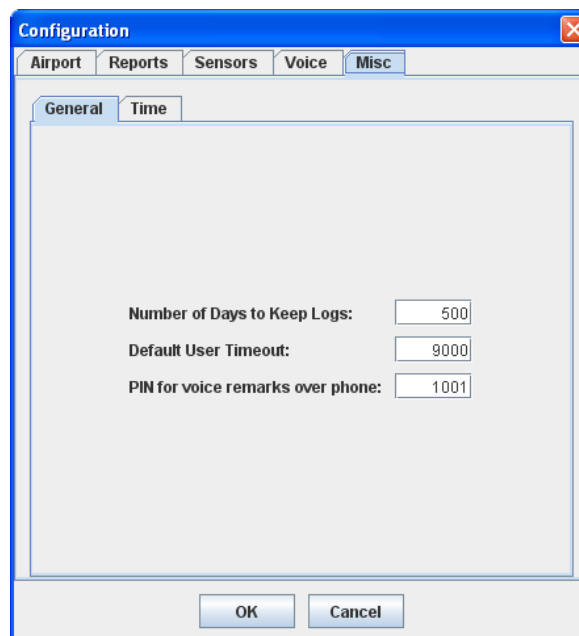
Figure 53. General Tab

9.4.5.2 Time Tab

Use the **Time** tab (Figure 54) to set the GPS receiver as the time source for the AWOS software or to manually enter the time and date. **Use GPS Time** should be selected in normal operation; disable only if the GPS Receiver fails.

- Select **Use GPS Time** to obtain time and date data from the GPS Receiver.
- To specify the time and date manually, uncheck the **Use GPS Time** box and enter the date and time in the corresponding fields. To enter the date, click the calendar icon to the right of the date field and select the desired date. This option will use the computer's built-in clock, which is less accurate than the GPS Receiver.
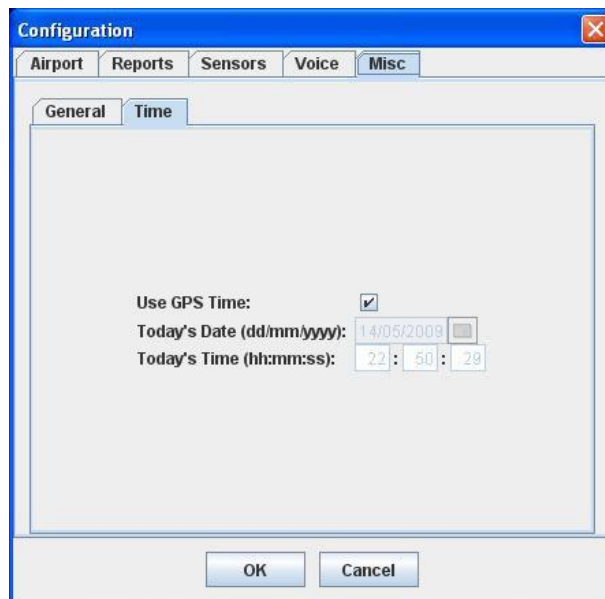
Figure 54. Time Tab

9.5 Alarm Configuration

Access to the options found on the *Alarm Configuration* menu requires the CD security key. Section 7.1.3 provides the details.

9.6 Turn On/Off Sensors

The *Turn On/Off Sensors* option on the *Edit* menu allows you to specify the sensor data to include on the display and in generated reports.

- When a sensor is turned ON, data for that sensor will be displayed and values will be included in logs and reports.

- When a sensor is turned OFF, the sensor will appear as "missing" on the display and in reports.

- When a sensor is ON, its value will be included in calculations and when it is OFF, any calculated values that are dependent on it will be appear as "missing."

The **Sensor Dialog** screen shown in Figure 55 is the interface for specifying the data to include.
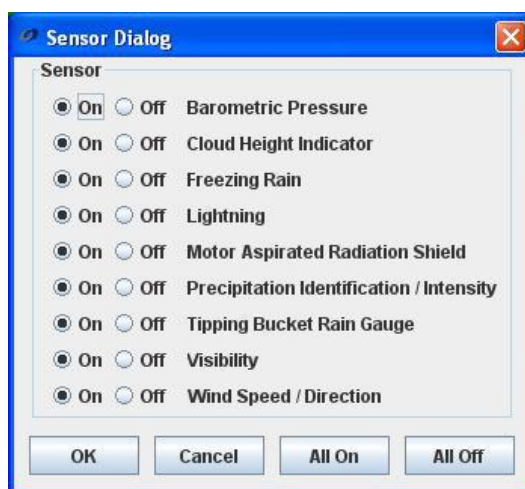
Figure 55. Sensors On/Off Screen

- Select the sensors to be turned ON or OFF individually by clicking **On** or **Off** beside the sensor name.

or

Turn all sensors ON by clicking the **All On** button at the bottom of the screen.

or

Turn all sensors OFF by clicking the **All Off** button at the bottom of the screen.

- When done, click **OK** to save the settings, or click **Cancel** to discard any changes made.

9.7 Handling Archive Data

The three archive data options at the bottom of the *Edit* menu are used in conjunction with the Archives View (accessible from the *View* menu) to create collections of archive data. For details on using these options, refer to Section 10.4.

9.8 Voice Remark

The *Voice Remark* option (Figure 56) lets you record up to two 90-second voice remarks to be appended to the outgoing AWOS voice message.

Note: VHF radio and telephone voice outputs are suspended while the Voice Remark window is open.
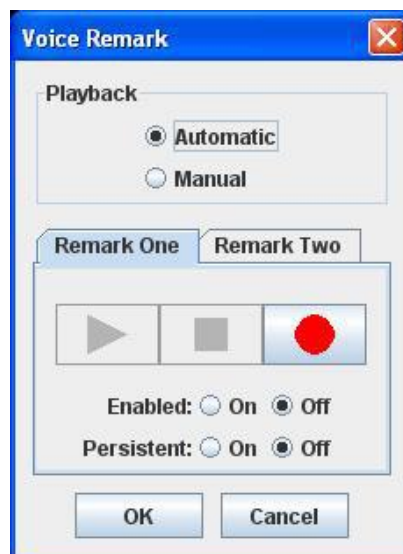
Figure 56. Voice Remark Screen

9.8.1 Recording a Voice Remark

The following steps describe how to record a voice remark.

1. Click the appropriate tab to select the voice remark to record (**Voice Remark One** or **Voice Remark Two**).
2. Click the **record** button ● to begin recording the remark.
3. Speak the remark clearly into the CDP microphone.
4. When done, click the **stop** button ■.
5. Click the **play** button ▶ to review the remark.
6. Set the status, playback mode, and enable output as described below.

9.8.2 Playback Mode

The **Playback** panel lets you select between two playback modes.

- In **Automatic** mode the outgoing voice message includes all available AWOS weather data in addition to any manually recorded voice remarks.
- In **Manual** mode, all automatically generated AWOS weather data is excluded from the voice output, and only manually recorded voice remarks are output.

9.8.3 Enabling Voice Output

The **Enabled** option at the bottom of the *Voice Remark* screen lets you enable or disable the voice remark. Voice Remark One and Voice Remark Two are enabled and disabled independently, so this selection must be made for each.

- Select **On** to output the voice remark with the outgoing voice message.
- Select **Off** to suspend output of the voice remark.

9.8.4 Voice Remark Expiration

The **Persistent** option at the bottom of the *Voice Remark* screen controls whether the voice remark expires or is on continually. Voice Remark One and Voice Remark Two are enabled and disabled independently, so this selection must be made for each.

*Note: For remarks containing weather data, **Persistent** should be set to **Off** to prevent out-of-date information being broadcast.*

- Select **On** to have the remark output continually without expiring.
- Select **Off** to set the remark to expire at 1 second past the top of the hour. With this option selected, the weather remark will have to be re-enabled to be output again after it has expired.

9.8.5 Telephone Access to Voice Remarks

Voice remarks may be enabled/disabled or edited by telephone. To use this feature, use the dial-in telephone number that you would normally use to access the telephone voice output.

1. Press **5** to access the Telephone Access Menu.
2. Enter the PIN (the PIN was created as described in Section 9.4.5.1 followed by the **#** sign when prompted.
3. Choose a selection from those offered.
   - Press **1** to listen to the current voice remark(s).
   - Press **2** to record a new voice remark with a length up to 90 seconds (this will be Voice Remark 1).
   - Press **4** to exit the system.

4. If you selected **1** to listen to the current voice remark, you will hear the remark and whether it is active.

- If you are advised the remark is not active, press **1** to make the remark you just heard active. You will also have the choice to press **2** to create a new voice remark or press **4** to exit.

- If you are advised the remark is active, press **1** to make the remark you just heard inactive. You will also have the choice to press **2** to record a new voice remark or press **4** to exit.

- The system will exit automatically once you are done if you selected **1** or **2**.

5. If you selected **2** to record a new remark, you will be prompted to record the remark after the tone. The remark will be played back shortly after you finish making it.

- You will be asked to press **1** to accept the remark or to press **2** to record a new voice remark.

- You will be advised that the remark is not active, to press **1** to make the remark you just heard active, or to press **4** to exit.

- The system will exit automatically.

Any remarks activated via the Telephone Access Menu will become inactive automatically 1 second past the top of the hour.

Chapter

10

10. View Menu

(Keyboard shortcut Alt+v)

The *View* menu (Figure 57) lets you select the data view (Tower, Diagnostics, or Archives).

Figure 57. The View Menu

10.1 Selecting the Data View

The three options on the <u>V</u>iew menu let you select the data view. Each view contains different sets of data, and displays that data in different formats.

- To select a view, click the view name on the <u>V</u>iew menu. In the example above, the **Archives** view is selected.

- Not all views may be selectable. The views available to each user are controlled by the Administrator.

10.2 Tower View

Figure 58 shows the Tower View. This display is geared toward control tower use, with wind data shown on graphic dials and essential parameters organized visually for quick identification.

Figure 58. Tower View

10.3 Diagnostics View

The Diagnostics View is shown in Figure 59. The Diagnostics view provides access to system and sensor level status information. The display is divided into two panes.

- The narrow pane on the left side is the navigation pane, which lists the components with status information available. To select a component, click its name in the navigation pane.

- The main pane shows the status information for the selected component.

- Within any screen, warning conditions are shown in **YELLOW** and failures are shown in **RED**.

- Sensors that are not installed will still appear in the navigation pane, but all fields in the main pane will be blank. DCP status bits applying to uninstalled sensors will also be blank, as will relevant fields in the **Sensor Data** pane. No alarms will be triggered for uninstalled sensors.

10.3.1 System Diagnostics

The **System Diagnostics** screen (Figure 59) is the default screen to which the display opens.

- If new, unacknowledged alarms exist, a blinking red **ALARM** indicator is shown in the *System Status* box. A red alarm indicator 🟥 is shown in the navigation pane beside System Diagnostics.

- If all alarms have been acknowledged, the **ALARM** indicator turns a lighter red (as in Figure 59), and the navigation pane's System Diagnostics alarm indicator turns yellow 🟨.

- Running counts of *Acknowledged Alarms* and *Unacknowledged Alarms* are shown in two text boxes. The text boxes will change color to correspond with the state of existing alarms.

- If a sensor or DCP failure occurs, a red alarm indicator 🟥 will be shown in the navigation pane beside the affected component.

- If a sensor or DCP warning is present, a yellow alarm indicator 🟨 will be shown in the navigation pane beside the affected component.

- The On or Off status of the sensors is shown in the *Sensor Status* panel.

- The *System Info* panel shows the time at which the system was last started.

File Edit View Manual Observations Reports System Status Help   (User: Admin)

| 15/05/2009 | AWOS 3000   KAWI | 23:21:01 |

System Diagnostics
 DCP
     Cloud Height Indicator
     Freezing Rain
     Lightning
     Precipitation Identification / Intensity
     Visibility
 GPS

Alarm Status

Alarm

| Acknowledged Alarms: | 1 |
| Unacknowledged Alarms: | 0 |

Sensor Status

Barometric Pressure:	On
Cloud Height Indicator:	On
Freezing Rain:	On
Lightning:	On
Motor Aspirated Radiation Shield:	On
Precipitation Identification / Intensity:	On
Tipping Bucket Rain Gauge:	On
Visibility:	On
Wind Speed / Direction:	On

System Status

| Phone: | On |
| VHF Radio: | On |

System Info

| System Startup: | 15/05/2009 16:16:00 |

Figure 59. Diagnostics Display

10.3.2 DCP Diagnostics

Click the *DCP* heading in the list pane to call up the display shown in Figure 60. The display is divided into four panels.

Statistics	The **Statistics** panel provides a summary of DCP behavior, focused mainly on communications integrity.
Status	The **Status** panel shows the current status of several DCP operating parameters.
Sensor Data	The **Sensor Data** panel shows the most recent data received for each parameter.
Recent Responses	The Recent Responses panel shows a real-time record of incoming DCP poll responses in a scrolling list. The entries will scroll as new data is received, with the most recent response at the top of the list. The format of the DCP message is explained in Appendix A.
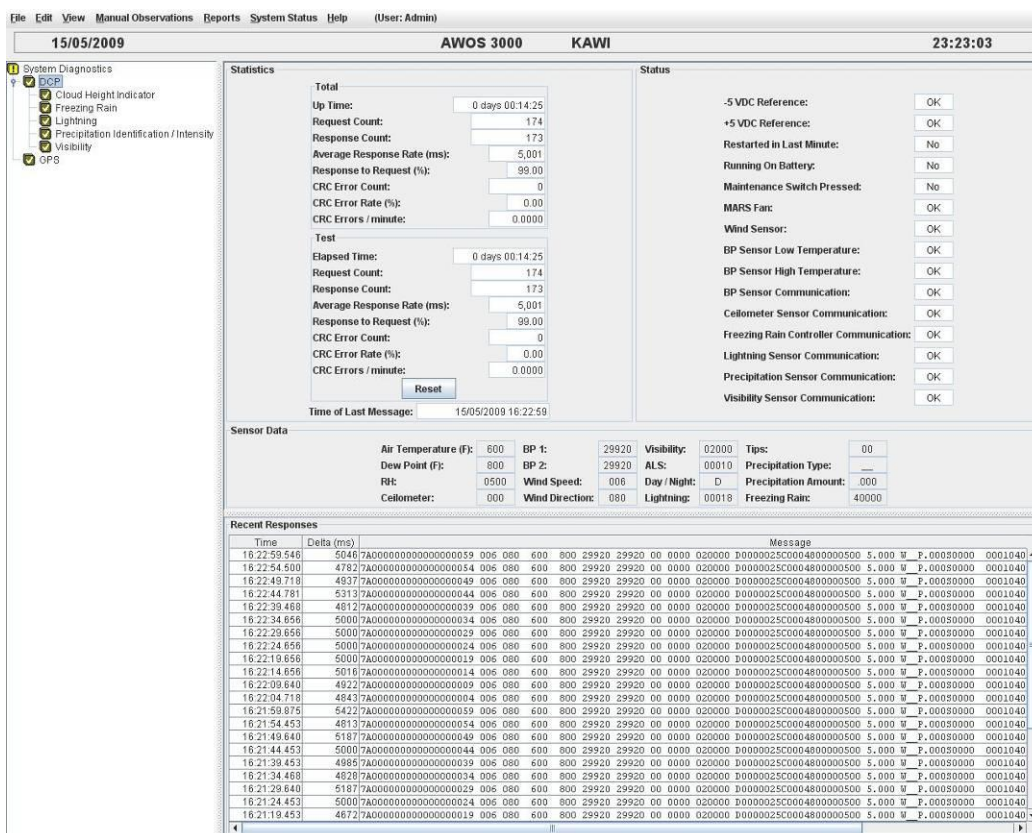
Figure 60. DCP Diagnostics Screen

10.3.2.1 Statistics

Statistics for a number of operational parameters are shown in Table 7 to assist the maintenance technician in isolating a problem.

The **Total** values represent data logged since power was last cycled on the DCP.

Table 7. Definitions for the Statistics Tab

Up Time	Shows the time elapsed since the AWOS 3000 server software was last started. All the values in this section are in relation to this Up Time.
Request Count	Shows the number of poll requests sent by the CDP.
Response Count	Shows the number of poll responses received from the DCP.
Average Response Rate (ms)	Shows the average time taken for a CDP poll request to be responded to by the DCP.
Response to Request (%)	Shows the percentage of poll requests that have received responses out of the total sent.
CRC Error Count	Shows the number of CRC errors detected in responses from the DCP
CRC Error Rate (%)	Shows the percentage of DCP responses containing CRC errors out of the total received
CRC Errors / minute	Shows the average number of CRC errors per minute detected in responses from the DCP

The **Test** panel (Table 8) allows a technician to view only current data by resetting all values with a click of the *Reset* button.

Table 8. Definitions for the Test Panel

Elapsed Time	Shows the time elapsed since the **Reset** button was last clicked. All values in this panel are in relation to this Elapsed Time.
Request Count	Shows the number of poll requests sent by the CDP.
Response Count	Shows the number of poll responses received from the DCP.
Average Response Rate (ms)	Shows the average time taken for a CDP poll request to be responded to by the DCP.
Response to Request (%)	Shows the percentage of poll requests that have received responses out of the total sent.
CRC Error Count	Shows the number of CRC errors detected in responses from the DCP
CRC Error Rate (%)	Shows the percentage of DCP responses containing CRC errors out of the total received
CRC Errors / minute	Shows the average number of CRC errors per minute detected in responses from the DCP
Reset	Click to reset the *Test* panel values to zero. Does not affect the values in the *Total* panel.
Time of Last Message	Shows the time at which the last response from the DCP was recorded.

10.3.2.2 Status

The *Status* panel shows the current status of a number of DCP components (Table 9). When a warning condition exists, the status will be shown in YELLOW. If a failure occurs, the status will be shown in RED.

Table 9. DCP status Indications

Field	Indications	Description	Warning or Error
-5 VDC Reference	**OK** or **Failed**	Shows the current status of the DCP power supply's -5 V DC reference	Error
+5 VDC Reference	**OK** or **Failed**	Shows the current status of the DCP power supply's +5 V DC reference	Error
Restarted in Last Minute	**Yes** or **No**	Shows whether the DCP has been restarted in the past minute	Warning
Running on Battery	**Yes** or **No**	Indicates whether the DCP is running on battery or line power. **Yes** indicates the DCP is running on battery power; **No** indicates it is running on line (AC) power	Warning
Maintenance Switch Pressed	**Yes** or **No**	Indicates whether the maintenance switch within the DCP has been pressed.	Warning
MARS Fan	**OK** or **Failed**	Indicates **Failed** when the fan within the MARS unit is not working correctly. When the MARS fan fails, all temperature and RH values will be shown as missing.	Error
Wind Sensor	**OK** or **Failed**	Shows **Failed** if no data is received from the wind sensor	Error
BP Sensor Low Temperature	**OK** or **Failed**	Indicates **Failed** if the BP sensor's temperature drops below the minimum operational tolerance	Error
BP Sensor High Temperature	**OK** or **Failed**	Indicates **Failed** if the BP sensor's temperature rises above the maximum operational tolerance	Error
BP Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the BP sensor	Error
Ceilometer Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the ceilometer	Error
Freezing Rain Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the freezing rain sensor	Error
Lightning Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the lightning detector	Error
Precipitation Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the present weather (precipitation ID & intensity) sensor	Error
Visibility Sensor Communication	**OK** or **Failed**	Shows **Failed** if no data is received from the visibility sensor	Error

10.3.2.3 Sensor Data

The *Sensor Data* panel (Figure 61) shows the most recent data received from each of the sensors. These values are updated each time a new message is received from the DCP.

Figure 61. Sensor Data Panel

When data from a sensor is missing, it is represented in the *Sensor Data* panel by a blank entry, as opposed to the slashes (//) used in the Tower View. Slashes are only used in this panel when communication between the DCP and CDP has been lost.

10.3.2.4 Recent Reponses

The *Recent Responses* panel displays all incoming poll responses from the DCP as they are received. Once the list is full, the entries will scroll, with the most recent response at the top of the list.

- The **Time** field shows the time at which the response was received

- The **Delta (ms)** field shows the elapsed time between the selected response and the response of the same type preceding it.

- The **Message** field shows the raw data message.

The format of the DCP message is explained in Appendix A.

10.3.3 Cloud Height Indicator Diagnostics

The **Cloud Height Indicator** diagnostics screen (Figure 62) shows the individual components of the Model 8339 Ceilometer's status word, which is transmitted in each data packet.
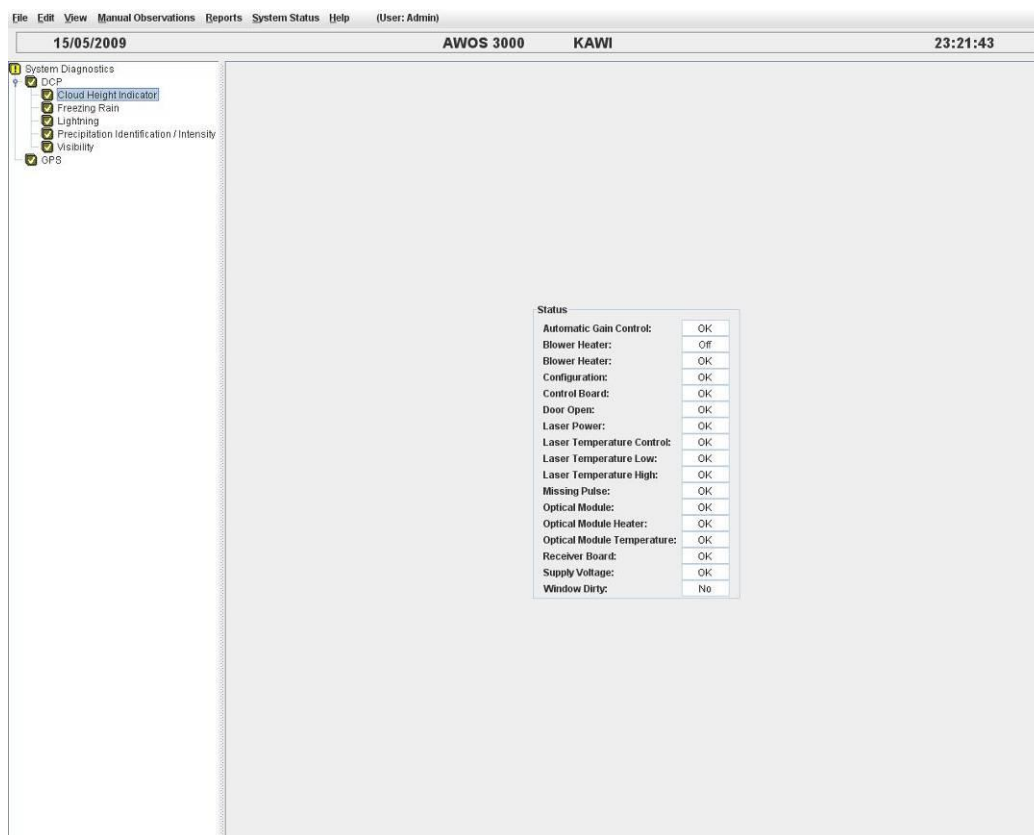
Figure 62. Cloud Height Indicator Diagnostics Screen

A brief explanation of each of the status fields shown on the diagnostics display is given in Table 10. Detailed explanations of each of these status items are provided in the *Model 8339 Laser Ceilometer User's Manual, 8339-F-001*. When a warning condition exists, the status will be shown in **YELLOW**. If a failure occurs, the status will be shown in **RED**.

Since the ceilometer is capable of discerning levels of error, any of the ceilometer status fields can indicate *either* a warning or a failure, depending on the severity of the condition. If a warning condition exists and is not addressed, it will progress to failure status. The status field will then change from **YELLOW** to **RED**.

Table 10. Definitions for the Ceilometer Status

Field	Indications	Description	Warning or Error
Automatic Gain Control	**OK** or **Failed**	If **Failed**, indicates an error in the Automatic Gain Control software.	Either, depending on severity
Blower Heater	**On** or **Off**	Indicates whether the Blower/Heater is currently powered on.	
Blower Heater	**OK** or **Failed**	Indicates the status of the Blower/Heater	
Configuration	**OK** or **Failed**	If **Failed**, indicates the configuration information has not been loaded or the firmware is corrupted	
Control Board	**OK** or **Failed**	If **Failed**, the Control Board must be replaced before the ceilometer can be returned to normal operation	
Door Open	**OK** or **Failed**	Indicates whether the ceilometer enclosure door is open (**Failed**) or closed (**OK**); triggered by the door's interlock switch. When the interlock switch has been placed in the bypass mode, the Door Open field would indicate the door is closed (**OK**).	
Laser Power	**OK** or **Failed**	Indicates **Failed** if laser power drops below the acceptable level.	
Laser Temperature Control	**OK** or **Failed**	Indicates the status of the Ceilometer's Peltier device	
Laser Temperature Low	**OK** or **Failed**	Indicates **Failed** if the laser temperature drops below the minimum operational tolerance	
Laser Temperature High	**OK** or **Failed**	Indicates **Failed** if the laser temperature rises above the maximum operational tolerance	
Missing Pulse	**OK** or **Failed**	Indicates **Failed** if an expected return laser pulse was not detected. Could be due to a number of causes; use in combination with other status conditions to determine cause	
Optical Module	**OK** or **Failed**	If **Failed**, the Optical Module must be replaced before the ceilometer can be returned to normal operation	
Optical Module Heater	**OK** or **Failed**	Indicates the status of the Optical Module's heater	
Optical Module Temperature	**OK** or **Failed**	If **Failed**, indicates the Optical Module's temperature is out of tolerance	
Receiver Board	**OK** or **Failed**	If **Failed**, the Receiver Board must be replaced before the ceilometer can be returned to normal operation	
Supply Voltage	**OK** or **Failed**	If **Failed**, indicates the main voltage supply has been lost	
Window Dirty	**OK** or **Failed**	If **Yes**, indicates the ceilometer lenses need cleaning	

10.3.4 Freezing Rain Diagnostics

The **Freezing Rain** diagnostics screen (Figure 63) shows the status of the Model 6495 Freezing Rain sensor components.
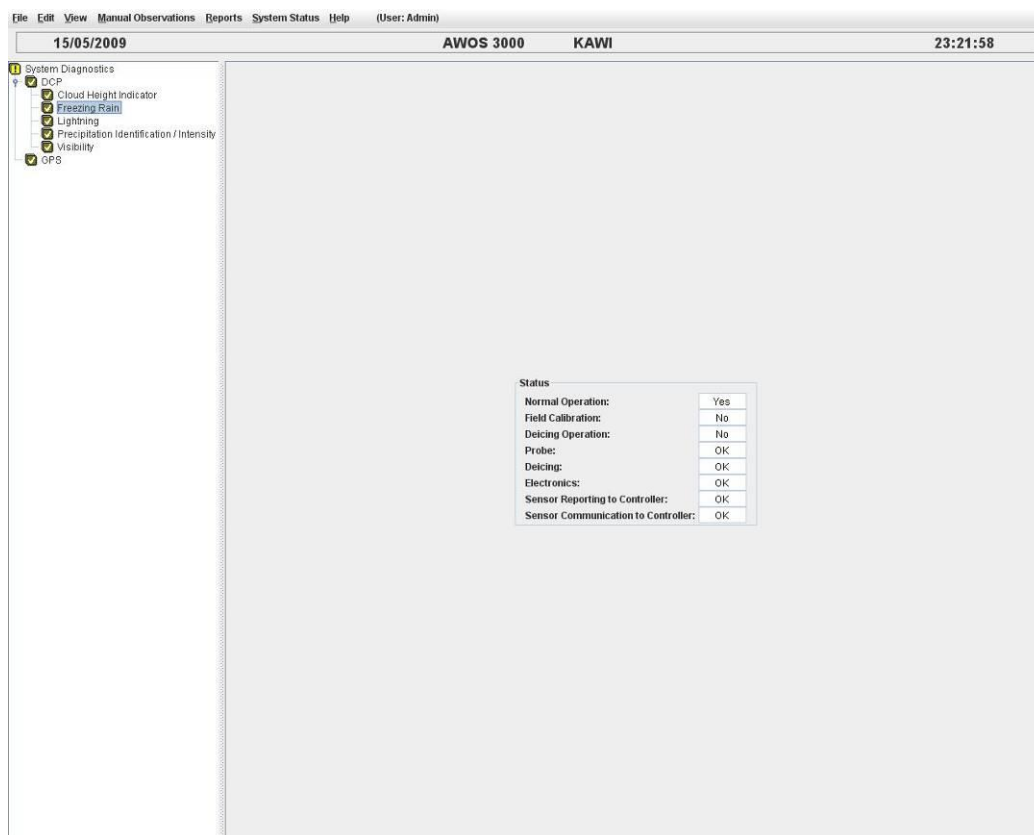
Figure 63. Freezing Rain Diagnostics Screen

A brief explanation of each of the status fields shown on the diagnostics display is given in Table 11. When a warning condition exists, the status will be shown in **YELLOW**. If a failure occurs, the status will be shown in **RED** .

Table 11. Definitions for the Freezing Rain Sensor Status

Field	Indications	Description	Warning or Error
Normal Operation	**Yes** or **No**	Indicates **Yes** if the sensor is functioning normally	Warning
Field Calibration	**Yes** or **No**	Indicates **Yes** if a field calibration is in progress	Warning
Deicing Operation	**Yes** or **No**	Indicates **Yes** if a deicing cycle is in progress	Warning
Probe	**OK** or **Failed**	If **Failed**, the sensor probe is not functioning properly	Error
Deicing	**OK** or **Failed**	If **Failed**, a sensor deicing cycle was not completed successfully	Error
Electronics	**OK** or **Failed**	If **Failed**, the sensor's electronics have reported a fault	Error
Sensor Reporting to Controller	**OK** or **Failed**	If **Failed**, the sensor is not reporting data and status to the controller board (located within the DCP enclosure)	Error
Sensor Communication to Controller	**OK** or **Failed**	If **Failed**, the DCP is unable to communicate with the controller board (located within the DCP enclosure)	Error

10.3.5 Lightning Diagnostics

The **Lightning** diagnostics screen (Figure 64) shows the status of the Model 6500 Thunderstorm/ Lightning Sensor components.

Figure 64. Lightning Diagnostics Screen

A brief explanation of each of the status fields shown on the diagnostics display is given in Table 12. When a warning condition exists, the status will be shown in YELLOW. If a failure occurs, the status will be shown in RED.

**Table 12. Definitions for the Thunderstorm/Lightning Sensor Status**

Field	Indications	Description	Warning or Error
Status Code	Numeric	00 indicates normal operation; other values indicate an error, which will be denoted in one of the fields below	Error
Antenna	**OK** or **Failed**	Indicates **Failed** if there is an antenna or antenna wiring problem	Error
Antenna Change Request	**OK** or **Failed**	Indicates **Failed** if a request was received to change the antenna mount to a location that does not match the configuration jumpers	Error
Processor/Antenna	**OK** or **Failed**	Indicates **Failed** if there have been invalid or missing internally generated test strikes; possible causes are a noisy antenna location or antenna wiring problem	Error
Configuration Changed	**Yes** or **No**	Indicates **Yes** if the antenna location (determined by processor jumpers) has changed since the system was last powered up	Error
Communication Buffer	**OK** or **Overload**	Indicates **Overload** if the communication buffer has become full; some data loss is likely	Warning
DSP Processor	**OK** or **Failed**	Indicates **Failed** if there is an error in the DSP processor	Error
DSP Processor Memory	**OK** or **Failed**	Shows **Failed** if there is an error in the DSP processor's memory	Error
Heading Reference	**OK** or **Failed**	If **Failed**, contact AWI Customer Support	Error
Main Processor	**OK** or **Failed**	Indicates **Failed** if there is an error in the main processor	Error
Main Processor Memory	**OK** or **Failed**	Shows **Failed** if there is an error in the main processor's memory	Error
Main or DSP Processor	**OK** or **Failed**	Shows **Failed** if an error has occurred in either the main or DSP processor	Error
Message	**OK** or **Invalid**	Shows **Invalid** if the sensor message is corrupted	Warning
Microphone	**OK** or **Stuck**	Shows **Stuck** if the microphone key has been asserted for 60 seconds or more	Error
Request	**OK** or **Invalid**	Shows **Invalid** if a poll command was not received properly	Warning
Serial Communication	**OK** or **Failed**	Shows **Failed** for communication errors, such as no data, wrong baud rate, excessive noise, etc.	Error
Serial Header	**OK** or **Failed**	Shows **Failed** if an error is detected in the message header	Error
XYZ Input	**OK** or **Failed**	If **Failed**, contact AWI Customer Support	Error

10.3.6 Precipitation Identification/Intensity Diagnostics

The **Precipitation Identification/Intensity** diagnostics screen (Figure 65) shows the status of the Model 6490 Present Weather Sensor components.

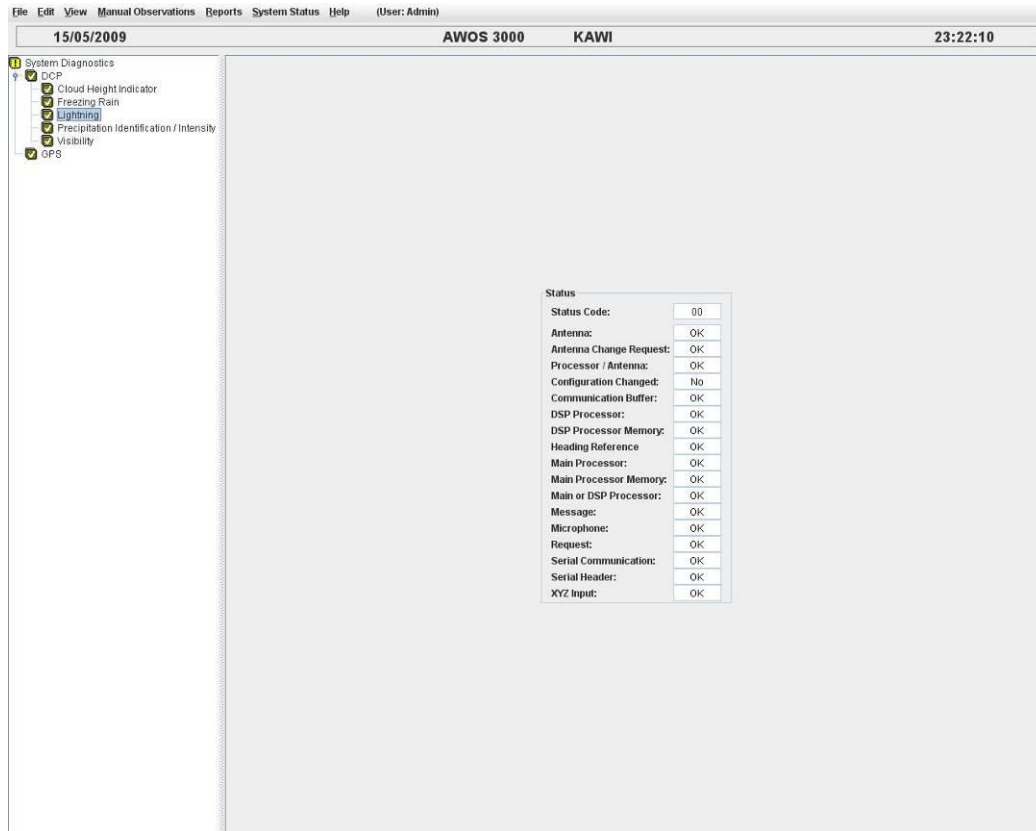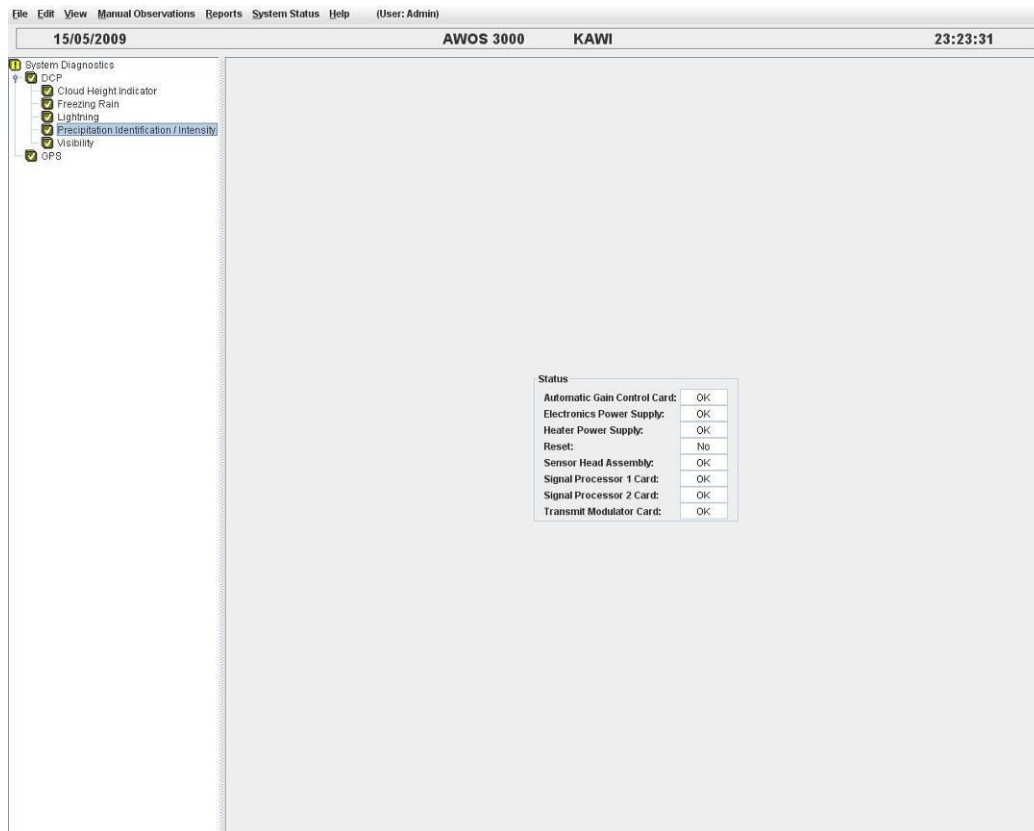**Figure 65. Present Weather Diagnostics Screen**

A brief explanation of each of the status fields shown on the diagnostics display is given in Table 13. When a warning condition exists, the status will be shown in <mark style="background-color: yellow">YELLOW</mark>. If a failure occurs, the status will be shown in <mark style="background-color: red">RED</mark>.

Table 13. Definitions for the Present Weather Sensor Status

Field	Indications	Description	Warning or Error
Automatic Gain Control Card	**OK** or **Failed**	If **Failed**, the Automatic Gain Control PCB must be replaced before the sensor can be returned to normal operation (not field-replaceable)	Error
Electronics Power Supply	**OK** or **Failed**	If **Failed**, the Electronics Power Supply must be replaced before the sensor can be returned to normal operation	Error
Heater Power Supply	**OK** or **Failed**	If **Failed**, the Heater Power Supply must be replaced before the sensor can be returned to normal operation	Error
Reset	**Yes** or **No**	Indicates Yes if the sensor has been reset in the past 5 minutes	Warning
Sensor Head Assembly	**OK** or **Failed**	If **Failed**, the sensor assembly must be replaced before the sensor can be returned to normal operation	Error
Signal Processor 1 Card	**OK** or **Failed**	If **Failed**, the Signal Processor 1 PCB must be replaced before the sensor can be returned to normal operation (not field-replaceable)	Error
Signal Processor 2 Card	**OK** or **Failed**	If **Failed**, the Signal Processor 2 PCB must be replaced before the sensor can be returned to normal operation (not field-replaceable)	Error
Transmit Modulator Card	**OK** or **Failed**	If **Failed**, the Transmit Modulator PCB must be replaced before the sensor can be returned to normal operation (not field-replaceable)	Error

10.3.7 Visibility Diagnostics

The **Visibility** diagnostics screen (Figure 66) is divided into four panels.

Configuration	The *Configuration* panel shows the current configuration of the visibility sensor.
Mode	The *Mode* panel shows OK or FAILED status for the visibility sensor's four operating modes.
Emitter/Detector	The *Emitter/Detector* panel shows the status of each of the four sensor heads and their associated heaters.
Other	The *Other* panel contains miscellaneous status data to aid in troubleshooting problems and gauging the overall operation of the sensor.

When a warning condition exists, the status will be shown in **YELLOW**. If a failure occurs, the status will be shown in **RED**.

Figure 66. Visibility Diagnostics Screen

10.3.7.1 Configuration

The visibility sensor has several configuration options (Table 14) that are set via the visibility controller. The *Configuration* panel shows the current configurations settings. Note that the settings cannot be changed through this screen; any changes must be made at the visibility controller.

Table 14. Definitions for the Visibility Sensor Configuration Panel

Field	Description
Averaging Interval	The visibility calculates average values of collected data internally, then outputs the average to the DCP. This field shows the averaging interval currently in effect. Possible settings are: 3 minutes, 5 minutes, or 10 minutes.
Output Interval	This field shows the frequency with which data is output to the DCP. Possible settings are: 10 seconds, 1 minute, 5 minutes, or 10 minutes
Output Type	This field shows the type of data being output by the sensor. Data can be output either as visibility values or as extinction coefficient.
Units	This field indicates the units of measure for output data, and can be either miles or kilometers.
Error	This field shows any errors detected by the sensor's internal diagnostics.

10.3.7.2 Mode

The *Mode* panel (Table 15) shows **OK** or **Failed** for the visibility sensor's four operating modes.

During normal operation, the visibility sensor alternates between Mode 0 and Mode 1 operation with a period of 15 seconds. Each half cycle, a new pair of detector measurements is acquired (one direct and one indirect). The measurement cycle period is 1 minute long, with 30 seconds spent in each mode.

A **Failed** status indicates problems with one of the four heads. The source of these errors can be further narrowed down by checking status for the individual heads in the *Emitter/Detector* panel. If only one head has failed, the field will show a warning (**YELLOW**). If more than one head fails, an error (**RED**) will be indicated.

Table 15. Definitions for the Visibility Sensor Mode Panel

Field	Description	Indications
Mode 0, Direct	Direct measurement between Emitter 0 and Detector 1	**OK** or **Failed**
Mode 0, Indirect	Scatter measurement between Emitter 0 and Detector 0	**OK** or **Failed**
Mode 1, Direct	Direct measurement between Emitter 1 and Detector 0	**OK** or **Failed**
Mode 1, Indirect	Scatter measurement between Emitter 1 and Detector 1	**OK** or **Failed**

10.3.7.3 Emitter/Detector

The *Emitter/Detector* panel (Table 16) shows **OK** or **Failed** for the visibility sensor's four heads and four heaters (one in each head). A **Failed** status indicates a failure of the head, or dirt or contaminants on the sensor window. If only one head has failed, the field will show a warning (<mark>YELLOW</mark>). If more than one head fails, an error (<mark style="color:red">RED</mark>) will be indicated.

Table 16. Definitions for the Emitter/Detector Panel

Field	Indications
Emitter 0	**OK** or **Failed**
Emitter 1	**OK** or **Failed**
Detector 0	**OK** or **Failed**
Detector 1	**OK** or **Failed**
Emitter 0 Heater	**OK** or **Failed**
Emitter 1 Heater	**OK** or **Failed**
Detector 0 Heater	**OK** or **Failed**
Detector 1 Heater	**OK** or **Failed**

10.3.7.4 Other

The *Other* panel (Table 17) shows status information for several parameters that can be used in the troubleshooting of sensor problems.

Table 17. Definitions for the Visibility Sensor "Other" Panel

Field	Indications	Description	Warning or Error
Power Supply	**AC** or **Battery**	Indicates whether the sensor is operating from battery or AC power	Warning
Complete Data	**Yes** or **No**	**Yes** indicates complete data is being received from all heads	Warning
Missing Data	**Yes** or **No**	**Yes** indicates incomplete data is being received from at least one head	Error
Window Dirty	**OK** or **Failed**	**Failed** indicates that contaminants (dust, etc) have accumulated on the emitter or detector windows. Cleaning the windows should clear this error	Warning
Operating Heads	**4** or **3**	Indicates whether the sensor is operating in 4 head (normal) mode or 3 head mode. Three-headed operation is initiated automatically when the software determines that one of the sensor heads is not functioning properly. In this mode, special algorithms are used to determine visibility based on the outputs of the three operational heads	Warning
Cross Check	**OK** or **Failed**	**Failed** indicates one of the sensor heads has failed	Warning
ALS or Day/Night Heater	**OK** or **Failed**	**Failed** indicates the heater has failed on the Ambient Light Sensor or Day/Night Sensor, whichever is installed.	Error

10.3.8 GPS Diagnostics

The **GPS** diagnostics screen (Figure 67) shows the status of the GPS unit.
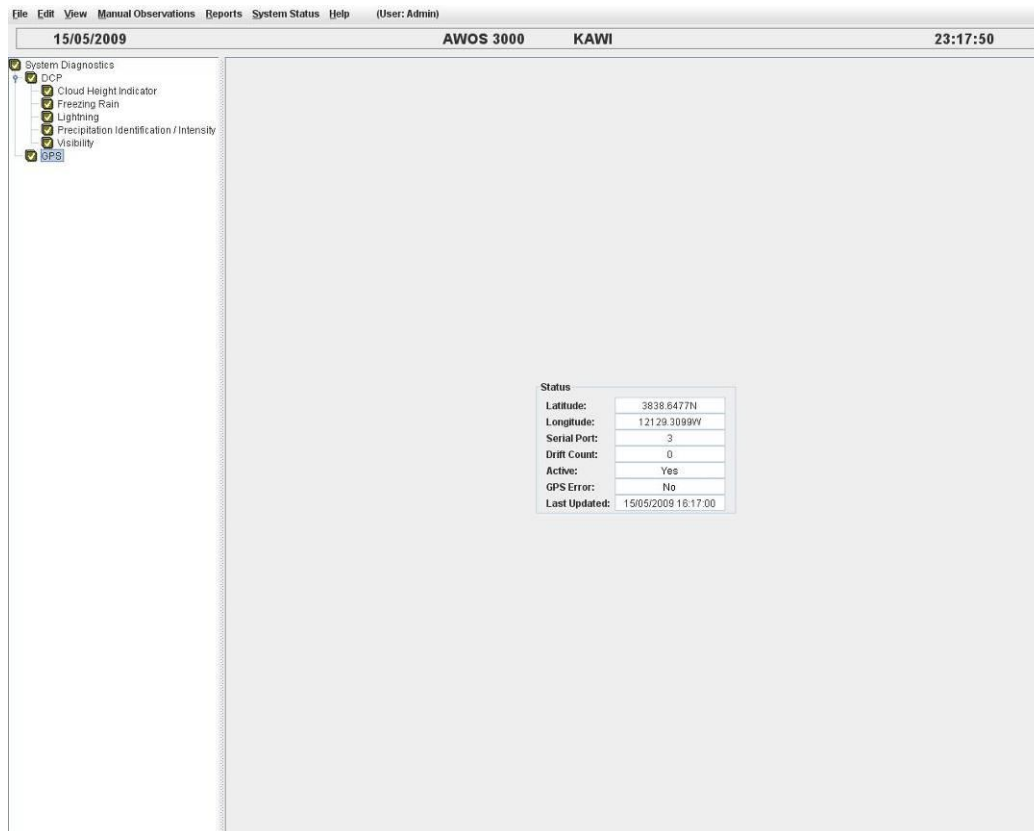
Figure 67. GPS Diagnostics Screen

A brief explanation of each of the status fields shown on the diagnostics display is given in Table 18 below. The only GPS field that will show an error is the **GPS Error** field. When an error is detected, **Yes** will be shown in this field in ██RED██. If the **Active** field displays **No** continuously for longer than one hour, an alarm will be generated. The other fields are informational, and will show a current value or will be blank.

Table 18. Definitions for the GPS Diagnostics Screen

Field	Indications	Description	Warning or Error
Latitude	Decimal Degrees	Latitude of the site in decimal format	None
Longitude	Decimal Degrees	Longitude of the site in decimal format	None
Serial Port	Number	Number of the serial port the GPS is connected to	None
Drift Count	Number	Number of times the GPS clock has been automatically adjusted	None
Active	**Yes** or **No**	If **Yes**, the GPS is connected and reporting	None
GPS Error	**Yes** or **No**	If **Yes**, the GPS has reported an error	Error
Last Updated	Date & Time	Date and time of the last message received from the GPS	None

10.4 Archives View

The *Archives* view (Figure 68) provides access to stored data logs. Using the archive options on the *Edit* menu, you can take a "snap shot" of data at a specific point in time for later reviewing. *Note: With the exception of Site ID (contained in the archive headers), site-specific parameters are not logged.*

Data entered manually will be displayed inside angle brackets, `<KAWI 100510…>`, for example.

The three archive data options at the bottom of the *Edit* menu are used in conjunction with the Archives View to create collections of archive data.

Figure 68. Archives View

10.4.1 Navigation and Data Panes

The Archives view is divided into two panes—the Navigation Pane on the left, and the Data Pane on the right.

- The Navigation Pane shows a hierarchy of all archived data. At the top level of the hierarchy is the Active folder, which contains all the automatically generated log files. (Manually generated Snap Shot archives—explained in the next section—are placed at the same level as the Active folder, labeled by date and time.) Beneath this top level are archive folders containing specific types of archived data logs—for example, Alarm logs, METAR logs, etc.) Archive folders can be expanded or contracted by clicking the open/close icon 🔓 to the left of the folder. By navigating down through the hierarchy, the desired log file can be located.

- The Data Pane shows the contents of the selected log file. To display the contents of a file, click its name in the navigation pane. *Note: The data in this pane are not updated dynamically. To refresh the contents, click another archive in the navigation pane, then return to the desired archive (click it again in the navigation pane) to view the updated data.*

- Click *Close* to close the log file currently displayed.

10.4.2 Snap Shot Archive

Using the **Snap Shot Archive** command on the *Edit* menu, collected data can be frozen at a specific point in time.

- When you click the **Snap Shot Archive** option, a new archive folder is created that contains all the data logs collected up to that moment. This folder is named according to the date and time at which it was created, and is located at the top level of the hierarchy. Use the open/close icons 🔓 to navigate through the archive's subfolders.

10.4.3 Delete Archive

In Archives View, the **Delete Archive** option on the *Edit* menu is used to delete a snap shot archive. You must be logged in as an Administrator to select this option. Automatically generated archives cannot be deleted manually.

- To delete a snap shot archive, highlight the archive in the navigation pane, then click **Delete Archive** on the *Edit* menu. You will be asked to confirm your selection. If you click **OK**, the archive will be deleted.

10.4.4 Save Archive

In Archives View, the **Save Archive** option on the *Edit* menu is used to back up a snap shot archive to the CD drive. Automatically generated archives cannot be selected for saving. To save a snap shot archive to CD:

1. Ensure that a CD is loaded in the CD writer.
2. Highlight the archive in the navigation pane, then click **Save Archive** on the *Edit* menu.
3. A screen will appear (Figure 69) that allows you to select the specific file types within the archive to save. To save all the files of a certain type (Alarm, for instance), click the box beside the folder; a checkmark will appear to show it is selected. To select specific files within the folder, click the open/close icon ⌐ beside the folder to view the contents of the folder. Click the desired files within the folder to select them for saving; a checkmark will be shown beside selected files.
4. Click **Save** to copy the files to CD.
5. Click **Cancel** to exit without saving any files.
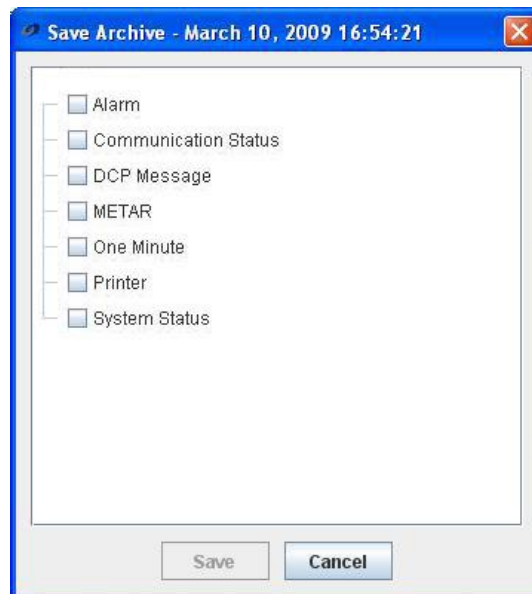
Figure 69. Save Archive Selection Screen

Chapter

11

11. Manual Observations Menu

(Keyboard shortcut Alt+m)

The *Manual Observations* menu (Figure 70) lets you enter manual observations for the primary meteorological parameters.

Manual Observations

Air **P**ressure ...

Air **T**emperature ...

Clouds ...

Lightning ...

Precipita**t**ion ...

Present **W**eather ...

Visibility ...

Figure 70. The Manual Observations Menu

11.1 Manual Observations and Automatic Data

The AWOS 3000 software allows users to enter manual observations in place of the AWOS automatic data. When a manual observations is active, the manual data replaces the data generated automatically. When the manual observation expires, automatic data reporting resumes (unless the sensor has been turned off via the *Edit > Turn On/Off Sensors* option). How this transition is handled in data processing depends on the parameter.

- For Precipitation and Lightning, automatic data is ignored while the manual observation is in effect. When it expires, the manual observation is discarded and automatic reporting begins from scratch.

- For Clouds and Present Weather, automatic data continues to be incorporated into the algorithm (though not displayed) while the manual observation is in effect. When it expires, the manual observation is discarded and the automatic value generated by the algorithm is displayed.

- For parameters where an average value is reported (Air Pressure, Air Temperature, and Visibility), the value displayed when the manual observation expires depends on the setting of the **Clear Averages** option on the Manual Observation screen:

❖ If **Clear Averages** is not selected, averages continue to be calculated in the background while the manual observation selection is in effect, with the manual observation treated as the sensor input. The calculated average is displayed until the manual observation expires. The displayed value will move gradually from the manual observation value toward the current automatically measured value as new data are incorporated into the average. The text color will return immediately to yellow once the manual observation expires, even though the manual observation is being included in the calculated average.

❖ If **Clear Averages** is selected, past data are cleared and averages are not calculated while the manual observation is in effect. When the manual observation expires, averaging of automatically measured data begins anew. The sensor will be reported as missing until sufficient data are gathered to calculate a valid average.

11.2 Manual Observation Text Colors

When a manual observation is active, the value on the Tower display will be shown in **BLUE** text. When the manual observation expires, the text will return to the normal yellow color.

If any value used in determining present weather is based on a manual observation (visibility, for example), the present weather value will also be shown in **BLUE** text.

11.3 Air Pressure Manual Observation

(Keyboard shortcut Alt+m then p)

The Air Pressure Manual Observation screen (Figure 71) lets you enter a manual observation for air pressure in place of the value generated automatically.

When set to Manual, sensor values must be entered manually on this screen. Automatically generated values will be ignored.

When set to Automatic, the values generated automatically by the AWOS will be used for display, output, and logging. In automatic mode, the manual observation entry fields are grayed out.

Enter a value for barometric pressure in the text box. Grayed-out in Automatic mode.

Check to prevent any previously logged values from being considered in calculating upcoming averages.

Click to exit and save entered data.

Click to exit and discard entered data

Figure 71. Air Pressure Manual Observation Screen

11.4 Air Temperature Manual Observation

(Keyboard shortcut Alt+m then t)

The Air Temperature Manual Observation screen (Figure 72) lets you enter manual observations for air temperature, dew point, and relative humidity in place of the values generated automatically. Values for all three parameters must be entered manually—the system cannot calculate related values (it cannot, for example, calculate dew point from temperature and humidity values entered manually.)

When set to Manual, sensor values must be entered manually on this screen. Automatically generated values will be ignored.

When set to Automatic, the values generated automatically by the AWOS will be used for display, output, and logging. In automatic mode, the manual observation entry fields are grayed out.

Enter a value for air temperature in the text box. Grayed-out in Automatic mode.

Enter a value for dew point in the text box. Grayed-out in Automatic mode.

Enter a value for relative humidity in the text box. Grayed-out in Automatic mode.

Check to prevent any previously logged values from being considered in calculating upcoming averages.

Click to exit and save entered data.

Click to exit and discard entered data

Figure 72. Air Temperature Manual Observation Screen

11.5 Clouds Manual Observation

(Keyboard shortcut Alt+m then c)

The Clouds Manual Observation screen (Figure 73) lets you enter manual observations for up to three cloud layers, along with sky condition and vertical visibility in place of the values generated automatically. Table 19 is a guide to the abbreviations used on the Manual Observations screen.
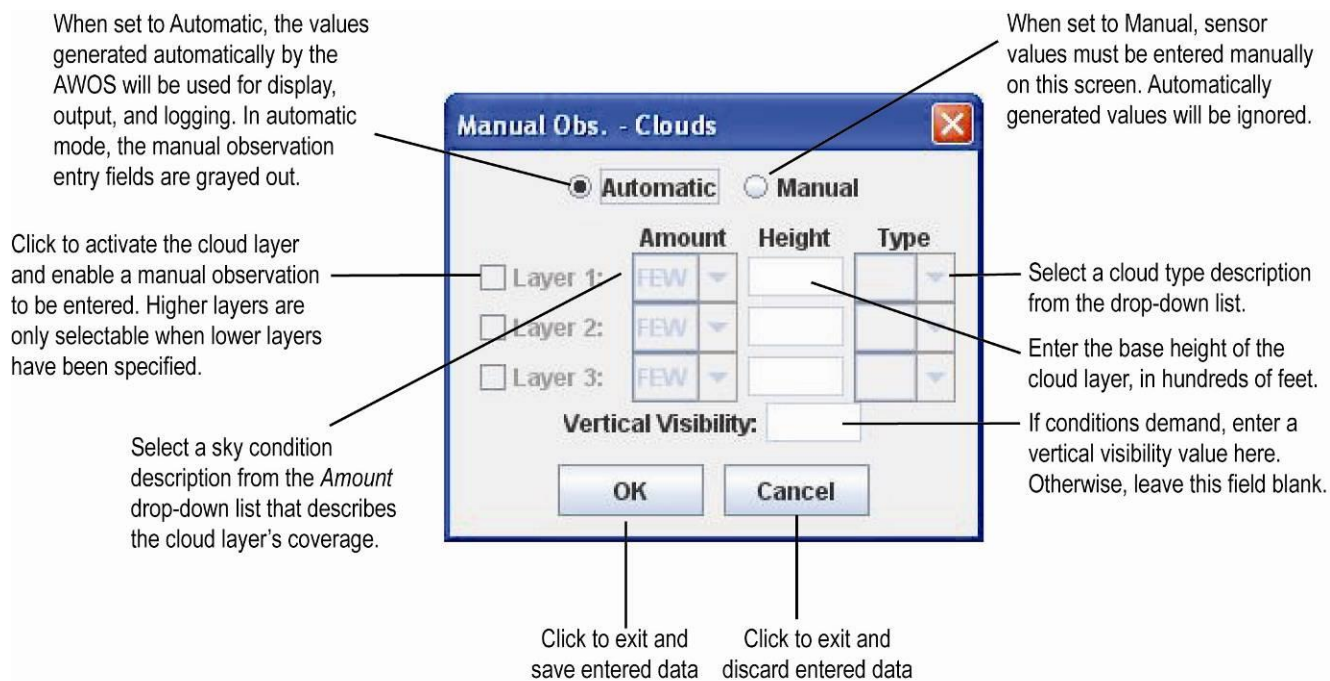
Figure 73. Clouds Manual Observation Screen

Table 19. Guide to Cloud Abbreviations

Amount		Cloud Type	
FEW	few (1–2 oktas)	**CB**	cumulonimbus
SCT	scattered (3–4 oktas)	**TCU**	towering cumulus
BKN	broken (5–7 oktas)		
OVC	overcast (8 oktas)		

Cloud Type is an optional field, and should only be used when a qualified observer has determined that a given cloud type is present.

The cloud type (if entered manually) and heights are shown in the Tower View display under Sky Condition, and are logged. The Sky Condition field shows a cloud cover description followed by the height(s) of the cloud base.

11.6 Lightning Manual Observation

(Keyboard shortcut Alt+m then l)

The Lightning Manual Observation screen (Figure 74) lets you enter manual lightning observations in place of the automatically generated data.

When set to Automatic, the values generated automatically by the AWOS will be used for display, output, and logging. In automatic mode, the manual observation entry fields are grayed out.

When set to Manual, sensor values must be entered manually on this screen. Automatically generated values will be ignored.

Select a range value; this indicates how near the airport lightning is being detected.

Click to select the octants in which lightning is present; multiple octants can be selected. Click again to de-select an octant.

Click to exit and save entered data

Click to exit and discard entered data

Figure 74. Lightning Manual Observation Screen

11.7 Precipitation Manual Observation

(Keyboard shortcut Alt+m then n)

The Precipitation Manual Observation screen (Figure 75) lets you manually enter a precipitation accumulation value in place of the value generated automatically. The precipitation entered manually should be the accumulation since the top of the hour.

When set to Automatic, the values generated automatically by the AWOS will be used for display, output, and logging. In automatic mode, the manual observation entry fields are grayed out.

When set to Manual, sensor values must be entered manually on this screen. Automatically generated values will be ignored.

Enter a precipitation value in inches.

Click to exit and save entered data

Click to exit and discard entered data

Figure 75. Precipitation Manual Observation Screen

11.8 Present Weather Manual Observation

(Keyboard shortcut Alt+m then w)

The Present Weather Manual Observation screen (Figure 76) lets you enter manual observations for two present weather groups in place of the values generated automatically. Table 20 contains the relevant abbreviations.
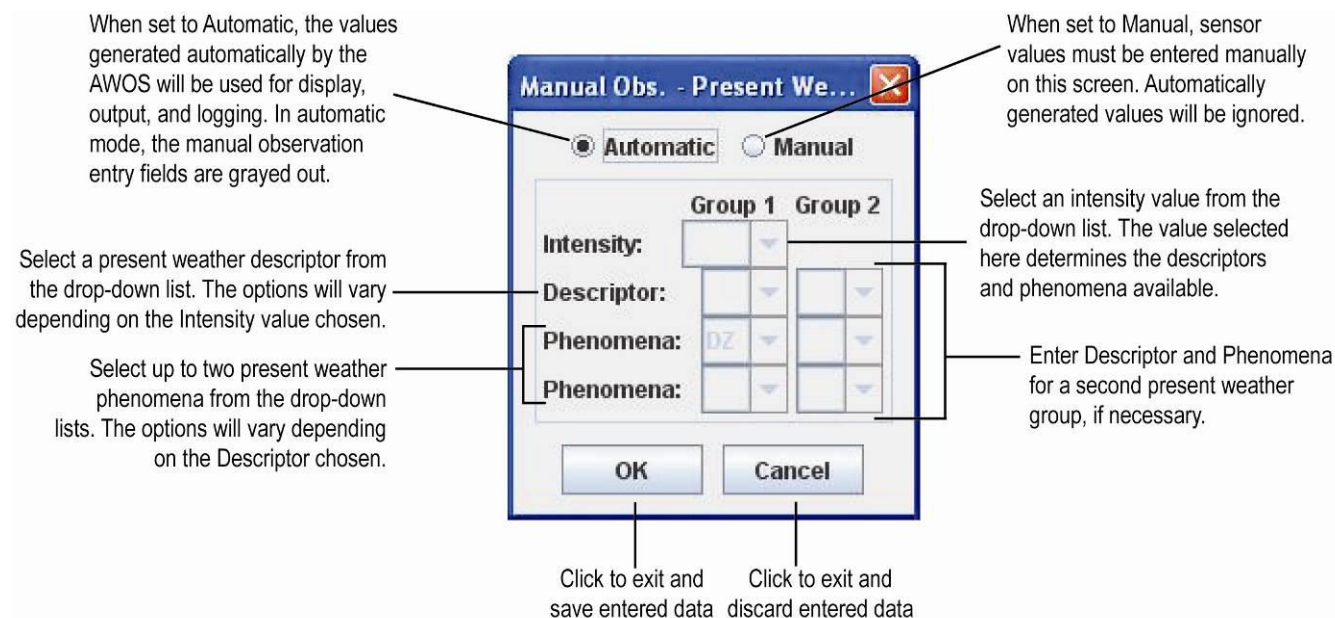
Figure 76. Present Weather Manual Observation Screen

Table 20. Definitions for the Present Weather Manual Observation Panel

Guide to Present Weather Abbreviations

Intensity		Descriptor		Phenomena			
-	light	**BC**	patches	**BR**	mist	**IC**	ice crystals
(blank)	moderate	**BL**	blowing	**DS**	dust storm	**PL**	ice pellets
+	heavy	**DR**	low drifting	**DU**	widespread dust	**PO**	well-developed dust/sand whirls
VC	in vicinity	**FZ**	freezing	**DZ**	drizzle	**RA**	rain
		MI	shallow	**FC**	funnel cloud, tornado, waterspout	**SA**	sand
		PR	partial	**FG**	fog	**SG**	snow grains
		SH	showers	**FU**	smoke	**SN**	snow
		TS	thunderstorm	**GR**	hail	**SQ**	squalls
				GS	small hail/snow pellets	**SS**	sand storm
				HZ	haze	**VA**	volcanic ash

Adapted from FMH-1 and FAA Order 7900.5B.

11.9 Visibility Manual Observation

(Keyboard shortcut Alt+m then v)

The Visibility Manual Observation screen (Figure 77) lets you enter a manual observation for MOR in place of the value generated automatically.

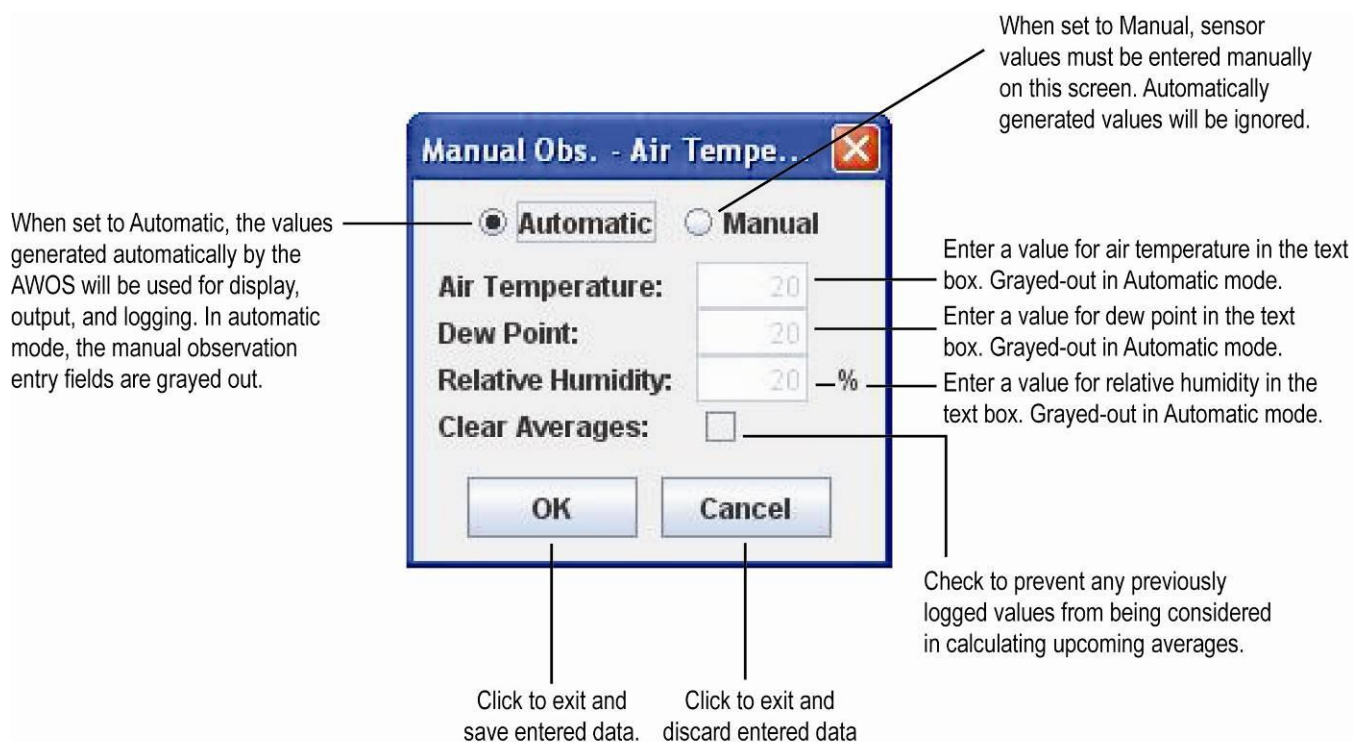*Note: When a visibility manual observation is active, variable visibility will be shown as missing.*
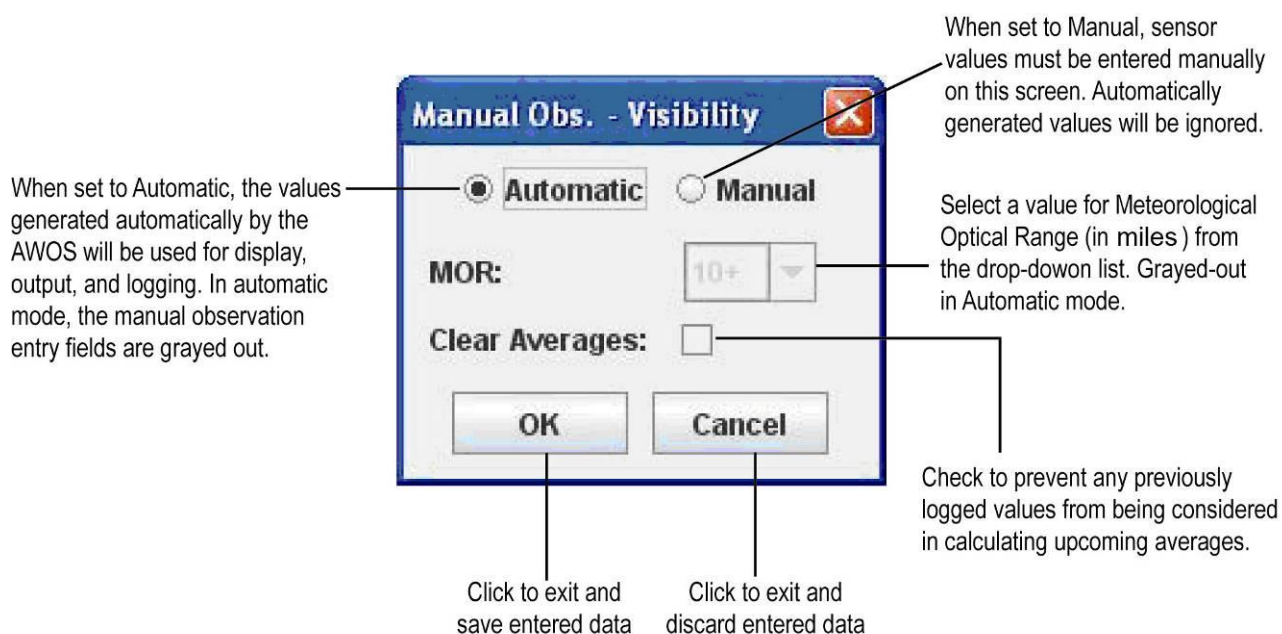
Figure 77. Visibility Manual Observation Screen

12. Reports Menu

(Keyboard shortcut Alt+r)

The *Reports* menu (Figure 78) lets you enter a manual remark to be appended to the METAR.

Reports

METAR Remar_k_ ...

Figure 78. Reports Menu

12.1 Entering a METAR Remark

(Keyboard shortcut Alt+r then k)

Manual remarks can be appended to the METAR message using the ***METAR Remark*** option on the *Reports* menu.

1. Click **METAR Remark** on the *Reports* menu. The screen shown in Figure 79 will appear.

METAR Remark

Persistent: ☐
Remark:

OK   Cancel
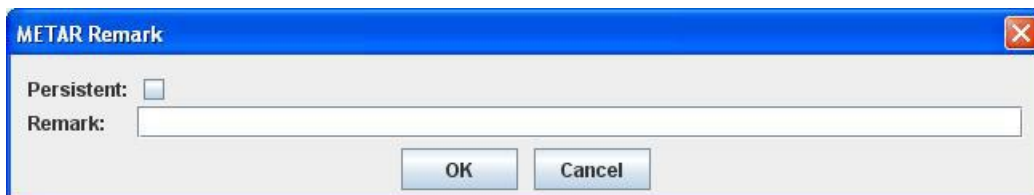
Figure 79. METAR Remark Screen

2. Enter the text to be appended to the METAR report in the **Remark** field. The maximum number of characters is 80.

3. Click **Persistent** to have the remark repeat in each METAR until the **Persistent** check-box is unchecked. When the **Persistent** checkbox is unchecked, the remark expires at the top of the hour.

4. Click **OK** to activate the remark and return to the main display. The remark will appear in the *Remark* field at the bottom of the Tower Display, and will be output with the METAR report.

5. Click **Cancel** to exit the *METAR Remark* window without appending a remark. Any new text entered in the *Remark* field will be deleted.

Chapter

13

13.   System Status Menu

(Keyboard shortcut Alt+s)

The *System Status* menu (Figure 80) allows you to view active and past alarms, and to turn on or off the blinking alarm alert.

Figure 80. The System Status Menu

13.1 Alarms...

Clicking the *Alarms...* option on the *System Status* menu calls up a list of current and past alarms, such as that shown in Figure 81. Each alarm entry in the list shows the date and time of the alarm, its status (New or Acknowledged), the type of alarm, and a brief description of the nature of the alarm. The time shown for the alarm is the time when the alarm condition was first met. The time is not updated when the alarm condition is met again. You can acknowledge or delete active alarms from the *Alarms* list.
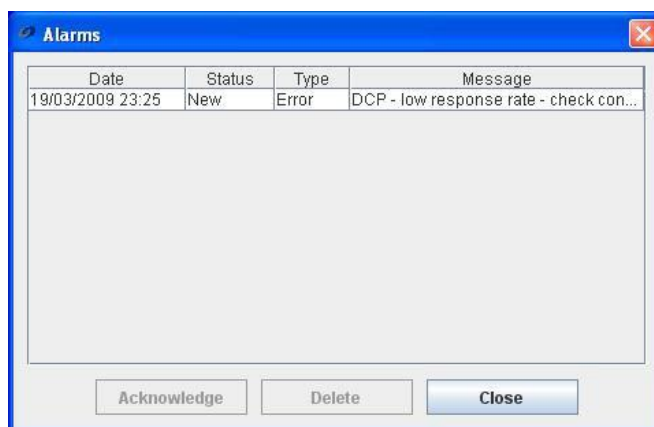
Figure 81. Alarms List

13.1.1 Acknowledging and Deleting Alarms

When an alarm is triggered, it will remain active (its status will show **New**) until either **acknowledged** or **deleted** by the user. No further entries for an active alarm will be added to the alarm list until it is acknowledged or deleted.

- To *acknowledge* an alarm, click the alarm on the list to highlight it. Multiple alarms can be highlighted and acknowledged as a group by performing a **<Ctrl>-click** on subsequent alarms to select once the first alarm to be acknowledged has been selected and highlighted. Then click the **Acknowledge** button at the bottom of the screen to acknowledge the selected alarms.

- "Ack" will be displayed in the *Status* column on the *Alarms* list

- The color of the **Alarm** text will change to a lighter red once all alarms have been acknowledged or deleted. The **Alarm** warning will continue to be displayed after the alarm is acknowledged (in the lighter color) even when alarm conditions no longer exist in order to keep an operator alert to intermittent problems.

- To *delete* an alarm, click the alarm on the list to highlight it. Multiple alarms can be highlighted and deleted as a group by performing a **<Ctrl>-click** on subsequent alarms to select once the first alarm to be deleted has been selected and highlighted. Then click the **Delete** button at the bottom of the screen to delete the selected alarms.

- All visual warnings will stop and the **Alarm** notice on the main display will be removed

- The alarm will be deleted from the *Alarms* list; a record of the alarm will still be maintained in the *Alarms Log*

- If the conditions that triggered the alarm are not addressed before the alarm is deleted, the alarm will reappear

Click **Close** to close the *Alarms* list.

13.2 Blink Alarm

The *Blink Alarm* option controls the alarm's visual appearance on the display. If the box is checked, the **Alarm** notice on the main display will blink when active. If the box is unchecked, the **Alarm** notice on the main display will remain steadily on. Regardless of the setting, all alarms will appear on the *Alarms* list explained above.

Chapter

14

14. Help Menu

(Keyboard shortcut Alt+h)

The ***Help*** menu (Figure 82) lets you view the current version of the AWOS 3000 software.

Figure 82. The Help Menu

14.1 About

(Keyboard shortcut Alt+h then a)

Click the ***About*** option on the *Help* menu to view the installed version of the *AWOS 3000* software.

The license agreement can also be accessed from this display.

Chapter

15

15.   Maintenance

Maintenance of the AWOS is divided into monthly, triannual, and annual maintenance tasks. Detailed sensor and system maintenance instructions are provided in the *AWOS 3000 Maintenance Manual* (3000-027).

16. Remote Maintenance Monitoring (RMM)

The CDP can be accessed remotely from another computer to set system parameters or view system status and data. This feature is referred to as Remote Maintenance Monitoring, or "RMM". No special software is required to access the AWOS CDP. Any terminal emulator program, such as ProComm or the Microsoft Windows Terminal Emulator program, can be used to access the AWOS for RMM.

The CDP is accessed for RMM purposed through the voice telephone line. The voice modem will switch to data mode if it detects three "*" tones during the call. Once communication is established, the user can enter commands to perform the following tasks.

- End the RMM session
- Enter a password to allow access to restricted functions
- Get a current AWOS system status report
- Get the current AWOS reported weather observation
- Get the AWOS system configuration
- Open a data file for downloading
- Download a data file that has been opened
- Get or set the AWOS system time
- Get or set the AWOS system date
- Get or set sensor online/offline state
- Get or set the VHF voice radio or phone online/offline state
- Reboot the CDP

16.1 Hardware Requirements

The following are minimum requirements to call the AWOS for RMM.

- Terminal emulator program such as Procomm or the Windows Terminal Emulator (terminal emulator programs are included with most operating systems)
- Telephone modem
- Dial up telephone line capable of 28.8 or higher data transmission

16.2 Establishing Communication with the AWOS

The following steps are required to access the AWOS CDP via RMM:

1. Boot the computer to be used to access the AWOS.

2. Start the computer's terminal emulator program (Procomm, Kermit, MS Terminal Emulator, etc.).

3. Configure the terminal emulator to communicate with the modem (set the comm port, baud rate, etc.). The recommended settings are 115200 bps, no parity, one stop bit. Other settings may be required, depending on the modem used. Consult the modem user's manual for details.

4. Type "AT" followed by return and verify that the modem returns "OK."

5. Set the duration of the "," delay to 1 second by typing "ATS8=1" followed by return. The modem should respond with "OK".

6. Dial the phone number by entering the following command:

ATDT <number>,*****<cr>**

In the above example, <number> is the AWOS voice telephone number with all required digits (to get an outside line, access long distance, dial the area code, dial the number). The command is followed by a carriage return. If the AWOS takes some time to connect, insert more delays in the command string by adding commas.

7. Once the AWOS recognizes the "*" tones, it will take approximately 15 seconds to connect to the calling modem. Do not type on the keyboard while the connection processing is taking place or the connection may be lost. After the modems have connected, a line of text containing the date, time, site ID, and the message CONNECT will be sent. You can then use the commands in the next section to obtain status and data.

16.3 AWOS RMM Commands

Table 21 describes the RMM commands available, along with their corresponding responses. The valid field entries for commands that use an accompanying variable (such as "filename" or "sensor") are listed in individual sections following Table 21.

Each command begins with a "$" character and ends with a carriage return. The commands are entered through the keyboard. Some terminal emulator programs allow macro keys to be programmed. The commands may be programmed as macro keys if desired. Refer to your terminal emulator's user manual for information on macro keys.

Table 21. RMM Command Summary

RMM Command	Description	Response
$HANGUP	End the RMM session	"GOOD BYE" is sent to the RMM computer and the connection is terminated
$GETCUR	Display the current AWOS weather report (formatted as the system printer output)	Current one-minute data (same as line printer) is sent to the RMM computer
$GETSTA	Display the current AWOS system status report	Current system status report is sent to the RMM computer
$CONFIG	Display the AWOS system configuration	Returns the system configuration data on the RMM computer
$OPENFIL filename	Open a file for transmission	Filename OPENED OK, or an error message is displayed
$GETFIL	Retrieve the contents of an open data file	Sends the contents of file "filename" to the RMM computer followed by >>END OF FILE
$SETIME	Retrieve the AWOS system time	Displays the current AWOS time on the RMM computer
$SETIME hh:mm:ss	Set the AWOS clock to hh:mm:ss	The AWOS sends, "The time will be set to HH:MM:SS" to the RMM computer. The user will be asked to confirm the change by typing "$SETIME" followed by return. The AWOS will set the time following this user confirmation, and will respond with "The current time is HH:MM:SS"
$SETDAT	Retrieve the AWOS system date	Displays the current AWOS date on the RMM computer

RMM Command	Description	Response
$SETDAT mm/dd/yyyy	Set the AWOS system date to mm/dd/yyyy	The AWOS sends, "The date will be set to MMM DD, YYYY" to the RMM computer. The user will be asked to confirm the change by typing "$SETDAT" followed by return. The AWOS will respond with "The current date is MMM DD, YYYY" Note: If the date is changed to an earlier date, resulting in duplicate logs being created for the same date and time, the newly generated data will be appended to the existing log file. No data will be overwritten.
$ONLINE	Show display sensor online status	The AWOS responds with "Offline: (list of offline sensors)" or "All sensors are online"
$ONLINE sensor	Set sensor "sensor name" to be online	The AWOS responds with "Offline: (list of offline sensors)" or "All sensors are online"
$OFFLINE	Show display sensor offline status	The AWOS responds with "Offline: (list of offline sensors)" or "All sensors are online"
$OFFLINE sensor	Set sensor "sensor name" to be offline	The AWOS responds with "Offline: (list of offline sensors)" or "All sensors are online"
$PASSWD password	Enter a password to enable restricted functions	The AWOS responds with "Password accepted" or "Please re-enter"
$VOICE	Display voice output status	The AWOS responds with on/off status of VHF and phone output
$VOICE service on/off	Turn service ("VHF" or "Phone") voice output on or off; example: "$VOICE Phone off"	The AWOS responds with changed on/off status of VHF and phone output
$ID	Display system IP data	The AWOS responds with system IP data
$REBOOT	Reboot the CDP	Notification that a system restart has been initiated is given to the RMM user, and is also shown on the CDP display

16.4 Password Processing

The $PASSWD command is required to access all functions except $GETCUR, $GETSTA, and $CONFIG.

16.5 $OPENFIL: Entering Filenames

The AWOS saves status and weather data in two types of files: ERRLOG files and PRINTER files.

- ERRLOG files contain status information updated every hour.

- PRINTER files contain a copy of AWOS weather data in the same format used in the line printer output, updated at one-minute intervals.

ERRLOG and PRINTER files are maintained for the length of time specified on the *Edit > Configuration > Misc > General* tab. By default, this value is set to 1 year (365 days).

File names for both types of files are of the format MMMDDYY where

- MMM is a three-character month (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)
- DD is a two-digit day (01 through 31)
- YY is a two-digit year (00 through 99)

For example, to retrieve a file for March 1, 2008, the file name would be MAR0108.

16.5.1 Retrieving Data Files

ERRLOG files are retrieved by entering the following with the $OPENFIL command.

$OPENFIL ERRLOG\filename

PRINTER files (weather archive data files) are retrieved by entering the following with the $OPENFIL command.

$OPENFIL PRINTER\filename

After the open command has been processed, the AWOS will respond with an acknowledgement of the file open command. An error message may be generated if the file was not opened properly.

Once the file has been opened, the $GETFIL command can be used to retrieve the data. If the terminal emulator program supports data logging, enable this feature to capture the screen data as it is downloaded. ERRLOG files may take a few seconds to download; PRINTER files may take up to one minute to download (depending on the modem connection baud rate).

After the files have been downloaded, they can be viewed with the terminal emulator program (if it supports file viewing), or with a text editor or word processor; they can also be printed to your system printer.

It is not necessary to close a file. The user can simply enter another command or disconnect from RMM. Data will continue to be logged.

16.6 $ONLINE and $OFFLINE: Specifying Sensor Names

The following abbreviations are valid for AWOS sensors/devices.

WS	wind speed
WD	wind direction
TP	temperature
DP	dew point
BP	barometric pressure
PC	precipitation
VI	visibility
CH	cloud height
PW	present weather
ZR	freezing rain
LX	lightning
VH	VHF radio voice; (with "$VOICE service on/off" command, "VHF" is used instead)
GP	GPS

Sensors that are set offline will not have their data reported in the voice message, and will not appear on the display terminal, printer, or in archive data. Turning off the VHF radio will cause voice output to the radio to stop—the radio remains powered on and keyed. The telephone voice will continue reporting—if all the sensors are offline, the AWOS will report temporarily inoperative to the voice output.

16.7 RMM Command Processing and Command Responses

Table 21 lists the AWOS responses to RMM commands.

If a command is valid, a response will be generated. If a command is invalid, an error message will be sent. The system will hang up if three invalid commands in a row are received.

If a password is required to access a function, and a password has not been entered, the AWOS will not respond to the command even though it appears to have been typed correctly.

16.8 Terminating the RMM Session

Use the $HANGUP command to terminate the AWOS RMM session. If this command is not used, the telephone may be busy for up to ten minutes before the AWOS automatically terminates the call for inactivity.

16.8.1 Automatic Termination

The RMM session will be automatically terminated after a given period of inactivity.

- If $PASSWD has been entered during the call, the AWOS will hang up ten minutes after the last command is entered.

- If $PASSWD has not been entered during the call, the AWOS will hang up within two minutes after the last command is entered.

Appendix A. DCP Message Format

The format of the input data message from the Model 1190 DCP received in response to a poll (RDCP00\r\n) is shown below. An explanation of the data field is given in Table 22.

[Communications: 9600 Baud, No Parity, 8 Data Bits, 1 Stop Bit]

Polled at 5-second intervals.

Preface:
    12 ff's
    3 syn's (0x16)

Packet:
1-5	7A000
6	Ascii address (from address dip switch + 0x30)
7-18	000000000000
19-	Data (*see* **Table 22**)
crc	4 hex-Ascii crc characters of DATA from 7A000 to the end of the DATA field
cr	
cr	
lf	

	Table 22 DCP Data Field Format			
Position	**Contents**	**Length**	**Description**	**Range**
0–1	Seconds	2 chars		00 to 59
2	blank			
3–5	Wind Speed	3 chars	5 sec avg wind speed	000 to 250 or MMM
6	blank			
7–9	Wind Dir	3 chars	5 sec avg wind dir	000 to 360 or MMM
10	blank			
11–14	Temperature	4 chars	5 sec avg temp 10s degF	-400 to 1350 or MMMM
15	blank			
16–19	Dew Point	4 chars	5 sec avg dptp 10s degF	-400 to 1350 or MMMM
20	blank			
21–25	Pressure #1	5 chars	inHg*1000	17000 to 34000 or MMMMM
26	blank			
27–31	Pressure #2	5 chars	inHg*1000	17000 to 34000 or MMMMM
32	blank			
33–34	Precip Ctr	2 chars	tips (reset at startup)	00 to 99
35	blank			
36–38	Cloud Ht	3 chars	cloud ht/100ft	000 to 125 or MMM
39	Ceilometer Data Flag	1 char	Bit 0 = 1 if clear Bit 1 toggles every new output Bit 2 = 1 for 8339 Bit 2 = 0 for 8329	0, 5,,or 7 (0, 1, or 3 for 8329)
40	blank			
41–45	Visibility	5 chars	extinction coeff *1000	00000 to 99999 or MMMMM
46	Visibility Status	1 char	counts from 0 to 7	(x30 to x37)
47	blank			
48	Day / Night	1 char	Day/Night	D, N, or M
49		1 char	0	
50–53	SIP Status	4 chars	SIP Status	4 hex Ascii characters
			Bit 1 = (0002) 1 if -5 V DC reference error Bit 2 = (0004) 1 if +5 V DC reference error Bit 3 = (0008) 1 if BP sensor temp lo Bit 4 = (0010) 1 if BP sensor temp hi >+55C) Bit 5 = (0020) 1 if MARS Fan Failure Bit 6 = (0040) 1 if Startup in last minute Bit 7 = (0080) 1 if On Battery Power Bit 9 = (0200) 1 if No comm, Visibility sensor Bit A = (0400) 1 if No comm, Ceilometer Bit B = (0800) 1 if Maint Sw prsd in last 5 min Bit C = (1000) 1 if No comm, Present Weather sensor Bit D = (2000) 1 if No comm, BP sensor	
54–57	8329 Status	4 chars	8329 Ceilometer Status	4 hex Ascii characters from 8329
58–65	VIS Status	8 chars	Visib Stat	8 hex Ascii characters from Visibility Sensor
66–69	RH	4 chars	5 sec avg RH *10	0000 to 1000 or MMMM

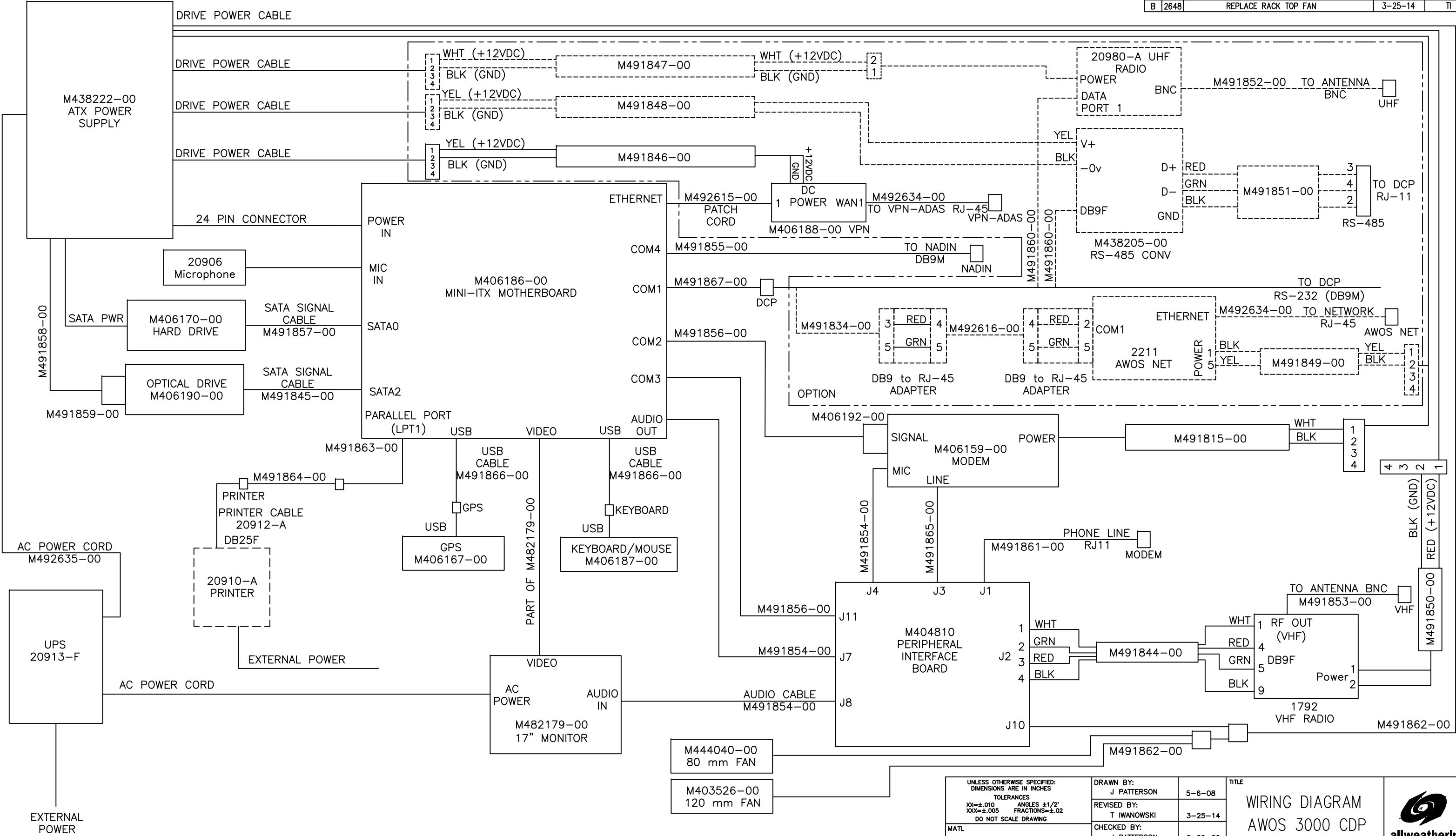| Position	Contents	Length	Description	Range
Table 22				
DCP Data Field Format				
70	blank			
71–75	Aux Voltage	5 chars	5 sec avg AuxPort V	0.000 to 9.999 or MMMMM
76	blank			
77–89	PresentWx	13 chars	Present Weather	Msg WwwPppppSssss or WMMPMMMMSMMMM
90	blank			
91	blank			
92–96	ALS VIS #1	5 chars	ALS 8364-E in Cd	00000 to 99999 or MMMMM
97–98	BP Temp	2 chars	BP Temp °C	00 to 99 (bp temp + 40°C)
99	blank			

100–104	LTX	5 chars	Lightning sensor data
			
			First character:
			  0 = no lightning
			  1 = lightning at the airport
			  2 = lightning in vicinity
			
			Second and third characters: sensor status
			
			Fourth and fifth characters: distant lightning.
				
				decimal range 00–54
				
				hex range 00–FF.

105	blank			
106–110	Freezing Rain Freq	5 chars	Freezing rain frequency	Up to 40 kHz
111	blank			
112–113	Freezing Rain Stat	2 chars	Freezing rain status	2 char status report, one character for status, one character for status descriptor
114	blank			
115–120	8339 Status	6 chars	8339 Ceilometer Status	6 hex Ascii characters from 8339
121	blank			
122–126	Software Version	5 chars	Software Version	5 character free form
127	blank			
128–131	CRC	4 chars	CRC	4 hex characters

Appendix B. Drawings

The following pages contain supplemental installation drawings and wiring diagrams.

3000-019	AWOS 3000 CDP Wiring Diagram (Rev B) 1792 VHF
3000-019	AWOS 3000 CDP Wiring Diagram (Rev F) 1793 VHF

DRIVE POWER CABLE

DRIVE POWER CABLE — WHT (+12VDC) / BLK (GND) — M491847-00 — WHT (+12VDC) / BLK (GND)

20980-A UHF RADIO
POWER
DATA PORT 1
BNC — M491852-00 TO ANTENNA BNC — UHF

DRIVE POWER CABLE — YEL (+12VDC) / BLK (GND) — M491848-00

DRIVE POWER CABLE — YEL (+12VDC) / BLK (GND) — M491846-00

M438222-00 ATX POWER SUPPLY

+12VDC / GND
DC POWER WAN1
M406188-00 VPN

YEL V+
BLK -0v
DB9F GND
M438205-00 RS-485 CONV

D+ RED
D- GRN / BLK — M491851-00 — TO DCP RJ-11
RS-485

24 PIN CONNECTOR — POWER IN

20906 Microphone — MIC IN

ETHERNET — M492615-00 PATCH CORD — M492634-00 TO VPN-ADAS RJ-45 — VPN-ADAS

COM4 — M491855-00 — TO NADIN DB9M — NADIN

COM1 — M491867-00 — DCP — TO DCP RS-232 (DB9M)

M406186-00 MINI-ITX MOTHERBOARD

SATA PWR — M406170-00 HARD DRIVE — SATA SIGNAL CABLE M491857-00 — SATA0

M491858-00

OPTICAL DRIVE M406190-00 — SATA SIGNAL CABLE M491845-00 — SATA2

M491859-00

COM2 — M491856-00

M491834-00 — 3 RED 4 / 5 GRN 5 — M492616-00 — 4 RED 2 / 5 GRN 5 — COM1 ETHERNET — M492634-00 TO NETWORK RJ-45 — AWOS NET
2211 AWOS NET — POWER 1 BLK / YEL — M491849-00 — YEL / BLK

DB9 to RJ-45 ADAPTER   DB9 to RJ-45 ADAPTER

COM3 — OPTION

PARALLEL PORT (LPT1)
M491863-00

M406192-00

SIGNAL
MIC
M406159-00 MODEM
LINE
POWER — M491815-00 — WHT / BLK — 1 2 3 4

USB — USB CABLE M491866-00 — GPS — USB — GPS M406167-00

VIDEO
PART OF M482179-00

AUDIO OUT — USB CABLE M491866-00 — KEYBOARD — USB — KEYBOARD/MOUSE M406187-00

M491864-00 — PRINTER
PRINTER CABLE 20912-A
DB25F
20910-A PRINTER
EXTERNAL POWER

BLK (GND) / RED (+12VDC) — 4 3 2 1
M491850-00

AC POWER CORD M492635-00

M491854-00 M491865-00

PHONE LINE RJ11 — M491861-00 — MODEM

TO ANTENNA BNC — M491853-00 — VHF

VIDEO
AC POWER
AUDIO IN
M482179-00 17" MONITOR

UPS 20913-F

J4 J3 J1
M491856-00 — J11
M491854-00 — J7

M404810 PERIPHERAL INTERFACE BOARD

1 WHT
2 GRN
J2 3 RED
4 BLK
— M491844-00 —

WHT
RED
GRN
BLK
1 RF OUT (VHF)
4
5 DB9F
9
Power 1 2
1792 VHF RADIO

AC POWER CORD

AUDIO CABLE M491854-00 — J8

EXTERNAL POWER

M444040-00 80 mm FAN

M403526-00 120 mm FAN

J10 — M491862-00 — M491862-00

DRIVE POWER CABLE

M492720-00
YEL (+12 VDC)
BLK
BLK
RED (+5 VDC)

DRIVE POWER CABLE

M438222-00
ATX POWER
SUPPLY

DRIVE POWER CABLE

M491862-00

TO COMMUNICATION
POWER OPTIONS
SHEET 2

SATA PWR
RED
BLK

24 PIN CONNECTOR

POWER
IN

ETHERNET   M492615-00   TO VPN-ADAS
PATCH   SHEET 2
CORD

COM4   M492721-00   M491867-00   TO NADIN   NADIN
PART OF   DB9M   (PANEL)
M406186-01

20906
Microphone

MIC
IN

RED
BLK

COM1   M491867-00   TO COMMUNICATION OPTIONS
SHEET 2
DCP
(PANEL)

M406186-01
MINI-ITX MOTHERBOARD

COM2   M492721-00   M406192-00
PART OF
M406186-01

SATA DOM SSD
M406384-00

SATA0

SIGNAL   M406159-00   POWER   M491815-00   WHT
MODEM   BLK
1
2
3
4

SATA PWR/SIGNAL
CABLE
M493099-00

SATA1

COM3

MIC   LINE   SPEAKER
M426066-00

M493102-00

PART OF
M493099-00

OPTICAL DRIVE
M406190-00

AUDIO
OUT

VHF
(PANEL)

TO ANTENNA BNC
M491853-01

USB0 USB2   VIDEO   USB3

M491854-00   M491865-00

RF OUT
(VHF)

1793
VHF RADIO

USB
CABLE
M492607-00

USB
CABLE
M491866-00

DVI TO
VGA
ADAPTER
M423439-00

USB
CABLE
M491866-00

PHONE LINE
M491861-00   RJ11   MODEM
(PANEL)

DB9M
4 9 6 1 8 3 2 7 5

PRINTER
CABLE
M492703-00

PRINTER
(PANEL)

GPS
(PANEL)

KEYBOARD
(PANEL)

J4   J3   J1

BLK (GND)
RED (+12VDC)

AC POWER CORD
M492635-00

USB

USB

USB

M492721-00   J11

1 WHT
2 GRN
J2 3 RED
4 BLK

WHT   WHT
RED
M491844-01   GRN
BLK

4 3 2 1

GPS
M406167-00

KEYBOARD/MOUSE
M406187-00

M404810
PERIPHERAL
INTERFACE
BOARD

20910-A
PRINTER

M491854-00   J7

PART OF M482179-00

AUDIO CABLE
M491854-00   J8

UPS
20913-F

EXTERNAL POWER

VIDEO

AC POWER CORD

AC
POWER

AUDIO
IN

J10

M403526-00
120 mm FAN

M491862-00

M491862-00

M491858-00

M482179-00
17" MONITOR

TO AWOS NET
POWER CONNECTOR

M491862-00

(SPLITTER CABLE
FOR AWOS NET
OPTION)

EXTERNAL
POWER

AC POWER CORD
PART OF
M406188-00C

TO VPN
SHEET 2

UHF RADIO DCP COMMUNICATION OPTION

TO
M491862-00
COMMUNICATION POWER CABLE
SHEET 1

DCP
(PANEL)

```
1
2
3
4
```

WHT (+12VDC)

M491847-00

WHT (+12VDC)

```
2
1
```

POWER

BLK (GND)

BLK (GND)

BNC

M491852-00   TO ANTENNA
BNC

M491860-00

DATA
PORT 1

UHF
(PANEL)

20980-A UHF
RADIO

RS-485 DCP COMMUNICATION OPTION

TO
M491862-00
COMMUNICATION POWER CABLE
SHEET 1

DCP
(PANEL)

```
1
2
3
4
```

YEL (+12VDC)

M491848-00

YEL

V+

BLK (GND)

BLK

-0v

D+

RED

3

M491860-00

D-

GRN

M491851-00

4

TO DCP
RJ-11

DB9F

GND

BLK

2

M438205-00
RS-485 CONV

RS-485
(PANEL)

VPN-ADAS OPTION

AC POWER
(UPS)
SHEET 1

PART OF M406188-00C

GND   +12 VDC

ETHERNET

M492615-00
PATCH CORD

RJ-45

WAN1

WAN1

M492634-00

RJ-45

VPN-ADAS

VPN-ADAS
(PANEL)

(M406186-01
MINI-ITX MOTHERBOARD)

M406188-00C
VPN

SIZE D	DWG NO. 3000-019		
SCALE NONE	REV LTR F	SHEET	2 OF 2