



May 21, 2005

Mark Råde  
Airport Authority of Guayaquil  
Avda. de las Américas - Airport International Simón Bolívar  
Guayaquil - Guayas  
Ecuador

Dear Mark,

Please let this serve as our revised quote for an Automated Weather Observing System (AWOS) for your site near Daular, Ecuador. Again, our system meets or exceeds the requirements listed in the Federal Aviation Administration (FAA) Advisory Circular 150/5220-16C.

Again, please note that Vaisala will not be responsible for the following items:

- AWOS maintenance. We do not have any representatives in Ecuador who are qualified to work on our AWOS equipment. I suggest that you select someone who you feel is qualified to attend our training class and who could provide the maintenance services to you after being trained.
- Vaisala is not responsible for providing perimeter fencing.
- The reportable values from the visibility sensors can not be reconfigured to report 3/8, 5/8, 7/8, 2-1/4, and 2-3/4. The visibility sensor will provide visibility values as follows (in statute miles): less than 1/4, 1/4, 1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 5, 7, and 10 miles.
- The present weather sensor will not report ice pellets and hail. The present weather sensor will report the following parameters: drizzle, rain, and snow. In the event of combinations of liquid and frozen precipitation, the sensor will report "precipitation".
- The AWOS has to operate from a 120V AC ( $\pm 10\%$ ), 60 Hz ( $\pm 5$  Hz), 3-wire single phase source. The system can not run on 240V. The maximum service required is 30 amps.

#### **AWOS Weather Reporting Criteria and Data Retrieval**

When recording hourly observations, our AWOS has up to a ninety (90) day archive capability and will provide a data archive in the format shown in attachment 2 of your email. The archive can be retrieved by connecting a laptop computer with ProComm Plus software to the AWOS test set inside the AWOS enclosure. A.A.G. will be responsible for providing the laptop computer and ProComm Plus software. Vaisala will provide a cable to connect the laptop to the AWOS test set.

#### **Lightning Protection**

All sensor and peripheral signals from the Signal I/O boards pass through a Suppressor board which is used in the ACU enclosure. Metal oxide varistors provide circuit protection for every signal input including the handset. The signals are then routed to connectors on the Sensor Interface Module which connect via ribbon cable.

Please refer to our drawing 01-23180, *AWOS Bi-Pad Installation Grounding*, so you can see how the system is grounded. The drawing also lists which items are NOT supplied by Vaisala.

**Training**

I included the price in my quote for a four (4) day on-site AWOS maintenance training class. The training will include equipment calibration, preventative maintenance, and data retrieval and downloading. A.A.G. will need to make arrangements for a classroom to conduct the training in.

**Site Selection and Platform Installation**

The AWOS equipment is scheduled to ship on September 9, 2005. We can make a separate trip to assist with the site location determination. I have included our price for this trip. Installation of the AWOS equipment would be assisted/supervised only by Vaisala and at a fixed per day price, which is listed on the quote. Our qualified Vaisala AWOS project manager would assist/supervise the installation. Vaisala will review project drawings provided by A.A.G. and will approve the final site selection for the AWOS.

Vaisala will provide a UPS battery backup system that will power the AWOS for a minimum of 1-hour if commercial power is lost. A.A.G. will be responsible for providing a generator if one is required.

**Sensor Expansion**

The proposed AWOS platform has the capability to expand at a later date to a full operational AWOS, including weather reports in a normal full METAR Code format.

If you have any additional questions, please feel free to contact me.

Best regards,

Steve Callahan  
Sales Manager  
Aviation Weather

Quote 0507-08  
Daular, Ecuador

**Mark Råde**  
**A.A.G.**

**A. AWOS Equipment**

**AWOS III PT (Model V-3PT-C)**

**\$69,985.00 USD**

The AWOS system includes the following:

- Complete Sensor Package
  - Wind Speed/Wind Direction Sensors
  - Temperature/Humidity/Dew Point Sensor
  - Dual Barometric Pressure Sensor
  - Visibility Sensor
  - Day/Night Sensor
  - Cloud Height Sensor
  - Present Weather Sensor
  - Thunderstorm Sensor
  - Precipitation Accumulation Sensor (Tipping Bucket)
- Necessary installation wires and hardware for each sensor
- AWOS Processing System (ACU configuration)
- 1000W Uninterruptible Power Supply (UPS)
- 30' Self-Supporting Wind Mast painted according to FAA specifications
- AWOS Equipment Frame
- NOTAM Recording Capability
- Dial-up Telephone Access
- AWOS Spare Parts to include:
  - Suppressor Board
  - Aspirated Fan assembly
  - Wind Sensor Bearing/Gasket Kit
  - 2-Obstruction Light Bulbs
- AWOS Test Equipment to include:
  - Digital Barometric Pressure Standard
  - Visibility Calibrator
  - Sling Psychrometer

**B. Training, Site Selection, Installation Assistance/Supervision, and Maintenance**

- **Four (4) day on-site AWOS maintenance training class for one (1) person \$ 8,900.00 USD**
  - Price includes travel to and from the site.
  - The price for additional trainees to attend the class is \$300 per person.
  - Additional training days will be invoiced at a rate of \$1,000 per day.
  - A.A.G. is responsible for providing and paying for a classroom.

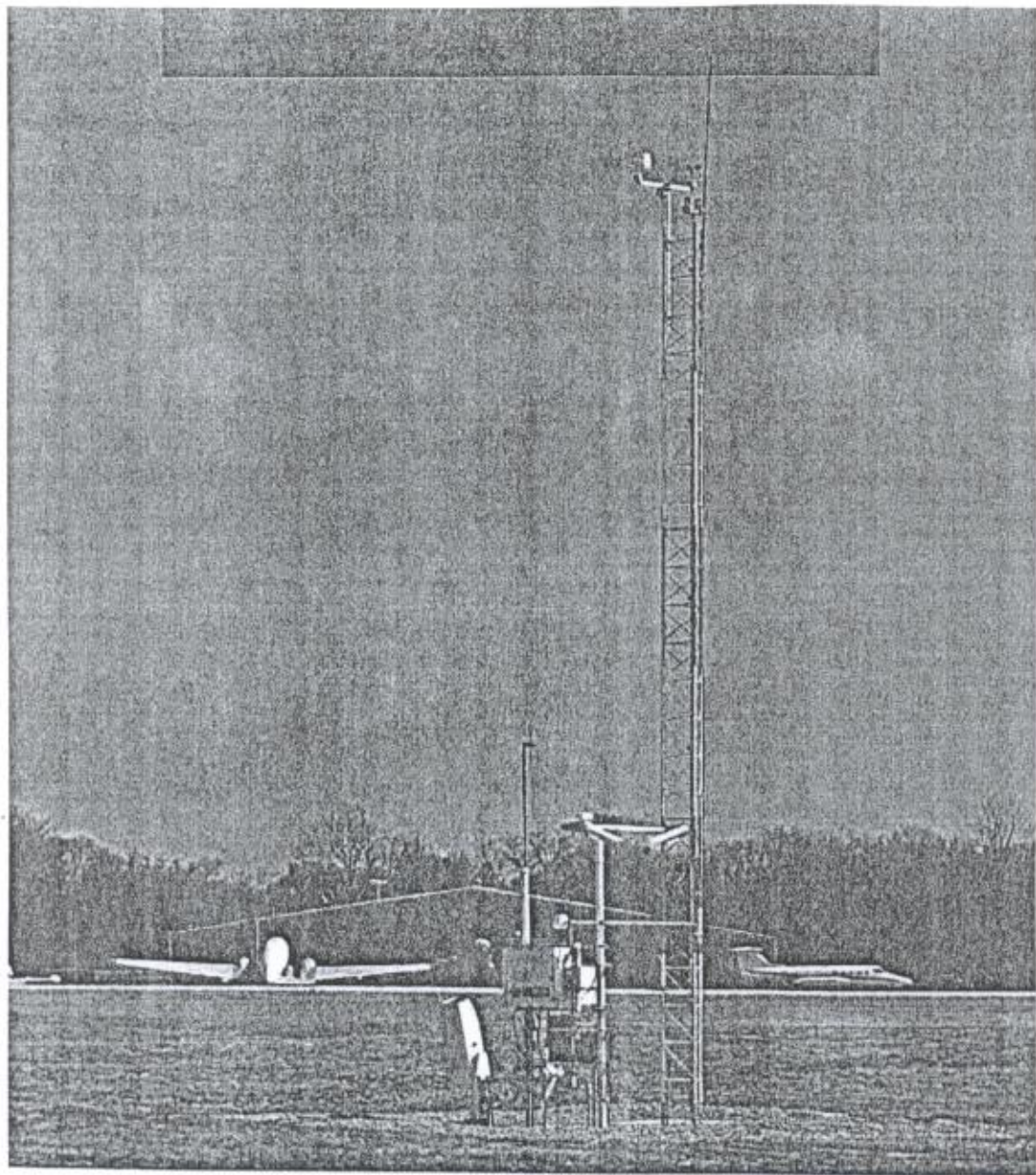


- Installation assistance and/or supervision will occur during the on-site maintenance training visit and will be invoiced at a rate of \$1,000 per day. If a Vaisala project manager has to make a separate trip to the site, an additional travel charge of \$2,000 will apply. The cost of the site survey trip and each bi-annual maintenance visit will also cost \$2,000 for travel expenses plus \$1,000 per day.

#### C. Terms

- All prices are in U.S. dollars.  
**Payment: 80% of equipment and training cost in advance, remaining 20% upon receipt of equipment and training. Site survey and bi-annual maintenance trip costs must be paid within 30 after receipt of service.**
- This quote is valid for 150 days.
- This quote includes equipment delivery to the job site.
- All equipment includes a 1-year warranty from the date of final acceptance or 24 months from the date of shipment, whichever occurs first.

# Automated Weather Observing Systems



 **VAISALA**

# Your Partner In All Weather

## Flexibility to meet the needs of any airport.

Vaisala provides a complete line of AWOS systems. And even more important, upgrades to incorporate new features are easy with a Vaisala AWOS. As an airport grows, its needs change. Vaisala ensures the AWOS is configured to meet the growing needs of any facility.

<b>AWOS A</b>	Provides current altimeter setting.
<b>AWOS I</b>	Provides current altimeter setting, temperature, dew point, and wind speed and direction.
<b>AWOS II</b>	Provides all AWOS-I features plus visibility.
<b>AWOS III</b>	Provides all AWOS-II features plus cloud height and sky condition.
<b>AWOS III P</b>	Provides all AWOS-III features plus present weather.
<b>AWOS III P/T</b>	Provides all AWOS-III features plus present weather and thunderstorm detection.
<b>AWOS IV</b>	Provides all AWOS-III features plus all of the following: Present Weather - Reports drizzle, rain, snow, precipitation intensity, fog and haze. Thunderstorm Sensor - Reports thunderstorm activity within a 30 mile radius of the airport. Freezing Rain Sensor - Reports the occurrence of freezing rain. Runway Surface Condition Sensor - Reports runway conditions such as dry, wet and possible freezing.

## Any combination of sensors can be incorporated into the AWOS.

In addition to the basic system, the Vaisala AWOS can be configured with many features to enhance total system performance. Other options include:

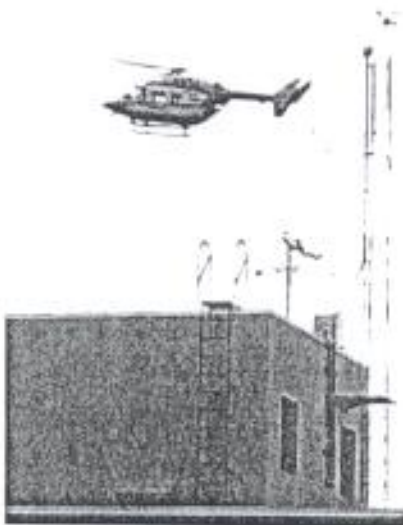
**Operator Terminals** - Up to two display monitors, keyboards or printers.

**NOTAMs** - Record and transmit Notices to Airmen (NOTAMs). Messages can be recorded locally or remotely and can be up to 150 seconds in length.

**Telephone Access** - Connect a phone line to access current weather or perform RMM (remote maintenance monitoring) functions. Second phone line optional.

## AWOS for heliports.

Vaisala AWOS also provides the same quality and accuracy in weather reporting for heliports. Having an AWOS on site increases operational safety and makes your heliport more appealing to commercial operators. Vaisala's experience in the aviation and heliport industry assures that your AWOS will be installed, operational, and certified quickly and professionally.





# The Vaisala AWOS Advantage

The Vaisala Automated Weather Observing System (AWOS) provides continuous, real-time weather reports, without human involvement, for users of aviation facilities. A new report is generated every minute from sensors located near the touchdown zone of the runway. The weather reports generated by the AWOS are made available to airport personnel via operator terminals and to pilots via high quality, digitized voice transmissions over VHF transmitter or navigational aid. The information is also available by telephone for flight planning.

An on-site AWOS increases airport utilization and safety by providing pilots with accurate and reliable weather information. Eliminating remote altimeter penalties allows use of the lowest published minimum descent altitude during instrument approaches.

The Vaisala AWOS is approved by the Federal Aviation Administration (FAA) to provide weather information for FAR Part 91, Part 135 and Part 121 operators, and meets or exceeds the specifications of Advisory Circular 150/5220-16 (latest edition). The AWOS is eligible for Airport Improvement Program (AIP) funding.

## **Expertise where and when you need it.**

Recognized as the global leader in meteorological systems, Vaisala draws on over 65 years experience in environmental technology. With weather systems and sensors installed in more than 100 countries around the world, Vaisala provides the expertise necessary to assist in the entire planning and installation of your AWOS project. Maintenance and training are also available, either on-site or at our facility. An award-winning customer support department assures that your system is operating at peak performance.

## **Technology you can count on.**

The AWOS uses the latest in Vaisala sensor technology, thereby providing users the distinct advantage of industry-proven quality, reliability and performance. Hardware like the FD12P Visibility/Present Weather Sensor and the SA20 Thunderstorm Sensor incorporate the latest innovations in weather sensing technology. These unique features, only available from a Vaisala AWOS, provide the most precise and reliable weather information available.

## **Improved features for enhanced system management.**

Performance of the system can be controlled through the Vaisala Remote Maintenance Monitoring (RMM) capability. This allows trained technicians to remotely monitor the AWOS performance, and in some cases make repairs to the system. RMM features include the capability to download software upgrades over phone lines and remote communication with each sensor to monitor output and perform maintenance functions.

The Vaisala AWOS includes a self-diagnostics program to continuously monitor all sensors and system functions. In the event that data is missing or questionable, the system reports the data as "missing" until the error is corrected, at which time the system automatically begins reporting the correct data.

Vaisala AWOS includes an alphanumeric, hand-held test set which simplifies AWOS maintenance. The test set performs various testing and calibration functions.

Data archiving is performed every 20 minutes from as few as 30 days up to 80 days. Additionally, a 56K bps modem is now standard for the Vaisala AWOS to make data transfer as efficient as possible.



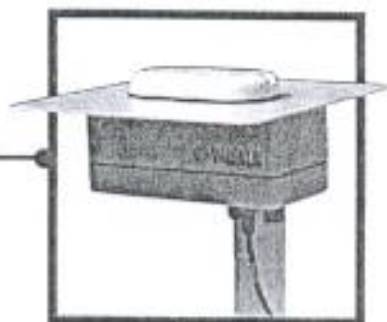
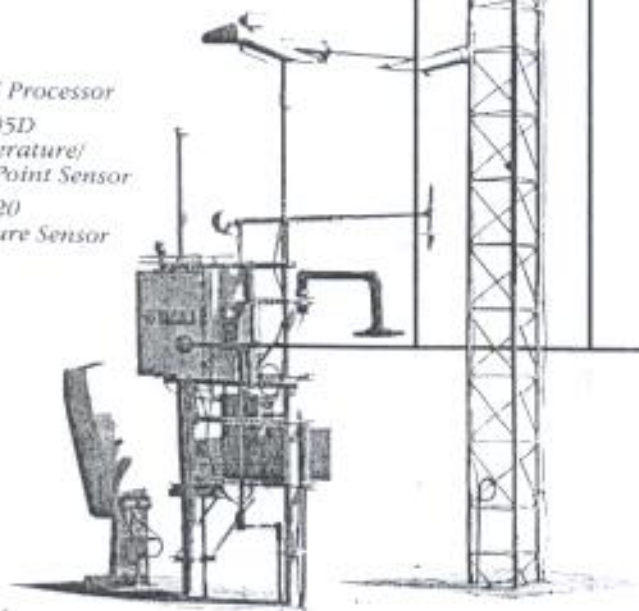


WAA151 Anemometer  
WAV151 Wind Vane

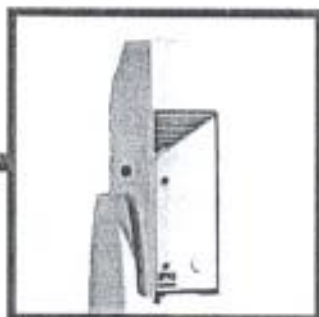


FD12P  
visibility/Present  
Weather Sensor

AWOS Processor  
HMP45D  
Temperature/  
Dew Point Sensor  
PTB220  
Pressure Sensor



SA20 StrikeAlert  
Thunderstorm Sensor



CT25K  
Ceilometer



Standard AWOS Display



## Options For Enhanced System Performance

### Customer Support You Can Count On

Vaisala customer service is every employee's focus. From sales and production, to engineering and customer support, the Vaisala staff is recognized as the industry's premier service provider.

The customer support department provides installation support, equipment hook-up, FAA commissioning assistance, and maintenance technician certification as needed during your project. After the AWOS is operational, customer support representatives provide technical support to system owners, operators, and technicians. The department is also available to perform routine and unscheduled maintenance.

Vaisala offers spare and replacement parts on demand, as well as a factory service and repair center to minimize system downtime and expenses. AWOS performance is enhanced by customer support technicians who use Remote Maintenance Monitoring (RMM) to observe system functions. In some cases, a system problem can be corrected remotely. As needed, Vaisala can proactively dispatch the maintenance technician to quickly restore a system to normal operation.

### Optional Graphic Weather Display for AWOS

The GWD can be installed and used at multiple FBO or ATC locations. Accurate, up-to-the minute weather conditions are reported clearly, quickly and accurately. The GWD is available as software only or as a complete package including preloaded software, computer and 14" color monitor (optional 17" monitor is available).



### Optional Thunderstorm Display for SA20

With the SA20 installed, the GWD clearly displays thunderstorm activity in the local area. Proximity of thunderstorms within a 30-mile radius are shown with color coded sectors around the airport location. Readable from across the room, the GWD ensures weather conditions are conveyed and understood.



### FD12P Visibility/Precipitation Weather Sensor

The FD12P is an integrated, multi-task sensor that functions as both an optical forward scatter visibility sensor and a precipitation identification sensor. The forward scatter capability provides visibility measurements from less than 1/4 mile to 10 miles, and identifies obstructions to vision such as fog and haze. The precipitation identification capability detects and reports the type of precipitation as drizzle, rain, snow or precipitation. Additionally, precipitation intensity is reported as light, moderate, or heavy.

### SA20 StrikeAlert Thunderstorm Sensor

The SA20 is a stand-alone, weather tight sensor, capable of detecting cloud-to-cloud and cloud-to-ground lightning activity. The sensor analyzes observations once per minute and maintains a 15 minute window archive. When interfaced with the Vaisala AWOS, the SA20 provides reports to pilots detailing the position of thunderstorms in three ranges:

- 0 to 5 nautical miles (NM) from the airport
- 5 to 10 NM from the airport -
- 10 to 30 NM from the airport

 **VAISALA**

Experience the Vaisala Advantage.  
Call: **1-800-327-AWOS** to discuss your specific AWOS needs.  
[www.vaisala.com](http://www.vaisala.com)