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ALASKA REGION UPPER AIR DATA COMMUNICATIONS

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SUMMARY OF REVISIONS: This supplement supersedes ARS 06-2004, Alaska Region Upper Air Data Communications, dated May 19, 2004, applicable to NWSOH No. 10. This supplement provides information on the new Alaska Upper Air Software. It lists additional upper air backup transmission methods and provides additional methods of ensuring timely receipt verification of data. It deletes references to the Federal Aviation Administration (FAA) Digital Aviation Weather Network (DAWN) communications system and replaces them with Aeronautical Information System Replacement (AISR). It corrects Internet Uniform Resource Locator (URLs) that were no longer valid and provides updated information on how the Alaska Computer Management Unit (CMU) supports communications and repair needs.

SIGNED

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September 24, 2008
Date

Alaska Region Upper Air Data Communications

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1. Introduction. The National Weather Service (NWS) Alaska Region (AR) has 13 offices responsible for taking upper air soundings twice daily at 00Z and 12Z. These soundings provide mission critical observational data used in global, national, and local forecast, warning and climate programs. This supplement describes the process and defines responsibilities for the dissemination of upper air data under normal circumstances and details procedures to follow if there are communications or equipment disruptions. This supplement only applies to non-RRS sites.

2. Communications Systems. This section contains a general description of the communications systems used for dissemination of upper air data.
 - 2.1 Alaska Region Headquarters (ARH). ARH serves as the computer network hub. All communications systems involved in the transmission of upper air data connect at ARH.
 - 2.2 WSONet. WSONet is a frame relay-based network that provides the primary connectivity between each upper air site and ARH. All upper air sites connect to ARH via WSONet. A commercial vendor provides the WSONet network circuits.
 - 2.3 Aeronautical Information System Replacement (AISR). AISR is a web-enabled system operated by the FAA which is designed to collect and distribute Weather, Flight Plan Data, Notice to Airmen (NOTAM) messages, Pilot Report messages, and other operational information to all Air Traffic facilities.
 - 2.4 NOAANet. NOAANet is an NWS-wide Internet Protocol network. NOAANet is the primary network connection between the Alaska Region and the NWS Telecommunications Gateway (NWSTG). Data transmitted on NOAANet can be sent anywhere on the network, including the National Centers for Environmental Prediction (NCEP).
 - 2.5 Advanced Weather Interactive Processing System (AWIPS). AWIPS is the primary system for dissemination, processing and display of meteorological information for forecasters in the NWS. The wide area network (WAN) connection back to the Network Control Facility at the NWSTG provides an alternate path for AR upper air data to reach the NWSTG and NCEP.
3. Communications Software. The primary software used to transmit upper air data is called UAX (Get Upper Air). It allows for several unique communications pathways which are described in Section 5.
4. Upper Air Backup Hierarchy. This section defines the upper air backup hierarchy in AR. The first level of backup to an upper air site will be provided by one of the other upper air sites, with the exception of Anchorage and Fairbanks, where the respective Weather Forecast Office (WFO) is the primary backup for their local upper air site. The second level of backup to an upper air site will be provided by one of the WFOs. Specific backup site designations are listed in sections 4.1 and 4.2.
 - 4.1 Upper Air Site Backup Assignments. The following table lists the assigned first level backup responsibilities for each upper air site. The backup station will transmit all the normal upper air messages before the established deadlines listed in section 5.12. The upper air site requiring backup will send their upper air data (including the appropriate World Meteorological Organization [WMO] header information) via facsimile, or any other possible means, to their backup office. The backup office will use one of the available transmission methods listed in Section 5.

<u>Upper Air Site</u>	<u>Backup Site</u>
Anchorage	Anchorage WFO
Annette	Yakutat
Barrow	Nome
Bethel	King Salmon
Cold Bay	St. Paul
Fairbanks	Fairbanks WFO
King Salmon	Bethel
Kodiak	McGrath
Kotzebue	Barrow
McGrath	Kodiak
Nome	Kotzebue
St. Paul	Cold Bay
Yakutat	Annette

4.2 WFO Backup Assignments. The following table lists assigned second level upper air backup responsibilities for each WFO. The upper air site will send the upper air data via facsimile, or any other possible means, to their backup WFO. Every attempt will be made to transmit Parts A, B, and C from each upper air site before the transmission deadlines.

<u>WFO Anchorage</u>	<u>WFO Fairbanks</u>	<u>WFO Juneau</u>
Bethel	Barrow	Annette
Cold Bay	Kotzebue	Yakutat
Kodiak	Nome	
King Salmon	Fairbanks	
McGrath		
St. Paul		
Anchorage		

If all regional communications networks fail, the WFO will manually enter the upper air data into AWIPS.

5. Communications Methods. This section contains a short description of each transmission method available for sending the upper air data to the NWSTG. There is a training tutorial available at each Alaska weather office on the proper use and features of the Upper Air Software.

5.1 Upper Air Software using FTP in the AUTO mode. This FTP (File Transfer Protocol) process involves the intranet server at ARH and is considered the primary method of transmission for upper air data to the NWSTG.

- 5.2 Upper Air Software using LDAD in the AUTO mode. AWIPS LDAD (Local Data Acquisition and Dissemination) involves the intranet server at ARH which then sends the data via AWIPS to the NWSTG for distribution.
- 5.3 Upper Air Software using MANUAL mode FTP direct to NWSTG. This method involves a local office launch of the Upper Air Software. This is valuable in cases when there are problems with the intranet server at ARH. An FTP connection is established directly between the Alaska weather office and NWSTG.
- 5.4 Upper Air Software using LDAD in the MANUAL mode. This method involves a local office launch of the Upper Air Software. This is valuable in cases when there are problems with the intranet server at ARH. The data is transmitted via AWIPS to the NWSTG for distribution.
- 5.5 NWSTG Web Bulletin Internet Page. The user can transmit data, upper air and other weather products at: <http://205.156.51.227/cgi-bin/webentry/webentry.pl>. This method is only available on NWS computers where an authorized IP address has been supplied to the NWSTG. Data may be copied from the Alaska Upper Air Software and pasted directly into the Web Bulletin Form. The data is typed in by hand if the Upper Air Software is not working.
- 5.6 Aeronautical Information System Replacement (Secondary Backup). This method is provided and maintained by the FAA. Their site is accessed at: <https://www.aisr.nas.faa.gov/AISR/>. Each Alaska Upper Air Office has been provided a username and password for AISR. Data may be copied from the Alaska Upper Air Software and pasted directly into the AISR Service B Message Text Window. The appropriate WMO Header is required and all messages are addressed to: KWBCYMYX
- 5.7 Application Program Suite (APS). Upper Air Data may be copied from the Upper Air Software and pasted into the top window of APS for transmission. This allows the user to transmit data via Sockets, a method not available in the Upper Air Software.
- 5.8 Facsimile and Telephone. If there is a local station data communications outage, and telephone or facsimile service is still available, the user should contact their backup office and relay the data to them via fax or voice transmission.
- 5.9 Email and Instant Messaging. There may be instances where upper air data could be pasted into an E-Mail or Instant Message and transmitted to the backup station. This would eliminate the need for the backup station to hand type data.
- 5.10 Weather Forecast Office Advanced Weather Interactive Processing System. The WFO can transmit upper air data by manually typing it into their AWIPS system.
- 5.11 Satellite (SAT) Phone and High Frequency (HF) Radio. All Alaska weather offices are equipped with SAT phones or HF radios which should be used in the event of a major communications outage. The SAT phone shall be used to call the designated backup station to relay upper air data. The HF radio shall be used to attempt contact with another Alaska weather office equipped with an HF Radio.

5.12 Message Transmission Deadlines. These are the data transmission windows for AR upper air messages:

	<u>00Z Cycle</u>	<u>12Z Cycle</u>
Part A	0000Z to 0040Z	1200Z to 1240Z
Part B	0000Z to 0040Z	1200Z to 1240Z
Part C	0000Z to 0150Z	1200Z to 1350Z
RADAT	2305Z to 0100Z	1105Z to 1300Z

In case of late or multiple releases, the station must transmit the data as soon as it becomes available. For example: a station would transmit an incomplete Part A message with data to 400MB at 0040Z rather than wait until 0115Z to transmit the complete Part A message. In case of a total communications outage, the station should transmit all messages as soon as communications are restored, even up to 12 hours after the normal transmission time.

A coded message notification will be transmitted each time an upper air station has a missing observation. The coded notification will include the reason for the missing observation. Example: 10142 - ground equipment failure, 10144 - power failure, 10145 - bad weather conditions. The complete list of 101 groups, as well as coding instructions, can be found in the National Weather Service Manual 10-1401, Appendix F.

Shown below is an example of how the three coded messages would look if McGrath, Alaska, had no upper air observation due to a ground equipment failure on day 26 of the month at 12Z.

```
USAK18 PAMC 261220  
MANMCG  
70231 TTAA 7612/ 70231 51515 10142=
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```
UMAK18 PAMC 261221  
SGLMCG  
70231 TTBB 7612/ 70231 51515 10142=
```

```
UFAK48 PAMC 261222  
ABVMCG  
70231 TTDD 7612/ 70231 51515 10142=
```

All upper air stations must do one of the following before the transmission deadlines:

1. Transmit complete upper air message.
2. Transmit incomplete upper air message due to a late or second release (10141 Group).
3. Transmit notification of delayed message (10143 Group).
4. Transmit message explaining why observation is missing (10142, 10158, etc.).

5. Contact the Backup Station or Parent WFO via telephone, facsimile, SAT phone, or HF radio to request assistance in the event of major communications outage.

5.13 Receipt Confirmation. The following eight methods can assist in determining if AR upper air data has been properly transmitted and received. The NCEP Thanks Page makes its final update at 0200Z and 1400Z for each upper air cycle. Every station shall have a “THKS”, “ABc”, or “abc” posted by the final transmission deadlines.

1. Alaska Upper Air Status Page: <http://ops.arh.nwsar.gov/newua/UAS.html>
2. NCEP Thanks: <http://www.nco.ncep.noaa.gov/pmb/nwprod/thanks/index.thankusa.php>
3. AISR: <https://www.aisr.nas.faa.gov/AISR/>
4. FX Net
5. AWIPS (WFO Stations Only)
6. University of Wyoming: <http://weather.uwyo.edu/upperair/sounding.html>
7. Contact Parent WFO Station or Backup Station
8. NCEP Senior Duty Meteorologist at 301-763-0902

6. Roles and Responsibilities in the Event of Transmission Failures. The following describes the primary roles and responsibilities for reporting and resolving upper air data transmission failures within AR. It is important that the Computer Management Unit (CMU) staff receive notification as soon as possible after it is determined that the primary transmission method is unsuccessful. The CMU staff can often make repairs in time to allow sites to meet all transmission deadlines.

6.1 Upper Air Site. The Alaska Region Hotline Number 907-271-1752 is used to report communications problems. The phone is answered promptly during normal work hours of 8:00 a.m. - 4:30 p.m., Monday - Friday. When a communications problem occurs outside normal work hours, the upper air site will determine whether station operations can continue in a satisfactory manner using any of the available backup communication methods. If backup methods are sufficient, the problem should be reported by leaving a message at the Hotline number. If immediate help is required, after the Hotline phone answers, select option zero. The 24-hour On Call staff member will answer the call, assess the situation, and facilitate restoring communications.

6.2 Computer Management Unit. The CMU staff has primary responsibility for day-to-day maintenance and operation of the data servers and regional network. The CMU staff will provide remote telephone support to help in fault isolation when there are upper air data transmission failures. The CMU operates a Hotline number of 907-271-1752 for assistance with communications problems.

6.2.1 Computer Program Manager. The computer program manager will ensure that the help desk voice mail is checked at least three times daily, at 8:00 a.m., 1:00 p.m., and 4:30 p.m. each business day. The computer program manager will provide an after hours contact telephone number to the meteorologist in charge at each WFO for inclusion in the station duty manual. The after hours contact number is for use when a failure requires an after hours repair call back.

6.2.2 Telecommunications Manager. The telecommunications manager is responsible for initiating and coordinating work orders with the commercial vendor for any changes required in the commercial WSONet network data connections. The telecommunications manager will track all network outages caused by commercial circuit failures and do any follow up actions needed with the vendor to ensure prompt restoration of the commercial network circuits. The telecommunications manager will provide current WSONet network circuit numbers and Network Operations Center telephone contact numbers to the computer program manager.

6.2.3 Network Monitoring. The AR uses an automated monitoring system called “Big Brother” to provide a visual indication of network status. The Big Brother web site is often helpful in determining what type of problem is occurring. Big Brother monitoring is available at: <http://sib.arh.nwsar.gov/bb/>. Another helpful site for Alaska communications network monitoring is the Multi Router Traffic Grapher (MRTG) site at: <http://mrtg.arh.nwsar.gov/overall.html>.