

# **Test Case Skew-T 2.0**

**for**

**Contract DG133W-05-CQ-1067**

**Advanced Weather Interactive Processing System (AWIPS)**

**AWP.TE.SWCTR/TO10-0015**

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6 February 2009

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## Change History

Revision	Date	Affected Pages	Explanation of Change
Draft	21 Nov. 2008	ALL	Initial Draft
1	16 Jan. 2009	ALL	Result of NWS comments and PDT
2	6 Feb. 2009	3, 6	Result of DT

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## **1.0 SCOPE**

See TO10 Software Test Plan.

## **2.0 APPLICABLE DOCUMENTS**

### **2.1 Source Documents**

- TO8 Test Case Skew-T 1.0

### **2.2 Reference Documents**

- TO10 Software Test Plan for the Advanced Weather Interactive Processing System Project, Contract #DG133W-05-CQ-1067, January 2009.
- Section 6 of the AWIPS D-2D User's Manual Build 8.1.
- Existing AWIPS 1 test procedures:
  - D2D\_RAOB\_1.4.1.1
  - Check\_out\_4.1.2\_Skew-T\_OB8.1
- The Silver Spring NWS AWIPS I test bed application.
- Release OB8.2 of the Weather Event Simulator (WES).
- Rational RequisitePro.

### **3.0 TEST CASE DESCRIPTION**

This test case is to verify that local and model Skew-T displays load and are editable. Upgrades from comparison to Bufkit and N-Sharp are also demonstrated. The interface and function with the Meteo Library are demonstrated by inference.

#### **3.1 Assumptions, Constraints, and Preconditions**

- TO10 software has been installed successfully.
- CAVE and EDEX are running.
- Data has been ingested.

#### **3.2 Recommended Hardware**

See TO10 Software Test Plan, Section 2.2.

#### **3.3 Test Inputs**

Section 4.0 contains the test procedures for this test case. Sections 2.2 – 2.9 of the TO10 Software Test Plan contain general test inputs applicable to all TO10 test cases.

#### **3.4 Test Outputs**

The images and data will be displayed in CAVE.

#### 4.0 TEST SCENARIO

Step #	Action	Result	Pass/Fail
1.	In the D-2D Perspective, under the Upper Air dropdown menu, select an available RAOB to display a sounding and hodograph.	A Skew-T tab appears with the most recent sounding for the selected site displayed in the large pane. A map in the upper left corner indicates its geographic location. General and Parcel parameters are listed in the right window, each with their own tabs.	
2.	Verify the Skew-T window displays: <ul style="list-style-type: none"> <li>– upper air sounding data</li> <li>– meteorological indices and values (Note: this step verifies (by inference) the Skew-T calls on meteolib functions</li> <li>– an inset map with the sounding location plotted</li> <li>– a tab with the 24 hour temperature change chart</li> <li>– a tab with the Hodograph</li> <li>– isobars, isotherms, dry adiabats, moist adiabats, and saturation mixing ratio lines</li> </ul>	The Skew-T window displays the upper air sounding data, the listed meteorological indices and values, an inset map with the plotted sounding location, a tab with a 24 hour temperature change chart, a tab with a Hodograph, and isobars, isotherms, dry adiabats, moist adiabats, and saturation mixing ratio lines.	
3.	Select Mouse Button (MB) 2 on the Skew-T product ID in the product legend.	The Interactive Skew-T and Hodograph are now editable. 'Skew-T Controls' window opens. Specific points appear on the Skew-T and Hodograph, which can be altered.	
4.	To edit the Skew-T, press and hold MB1 on a point on the temperature curve and drag.	The selected point changes and the temperature line adjust to the new value. Note that the data points are constrained to maintain their original pressure, so they can only be moved horizontally.	DR #1911
5.	Select and hold MB3 on one of the points on the temperature line. Then select 'Delete Vertex' from the menu.	The point is deleted from the temperature and dew point lines. The temperature and dew point curves modify interpolating between the data points above and below the deleted point.	
6.	Repeat steps 4 and 5 for the dew point line.	The dew point curve is edited. A point is deleted from the temperature and dew point lines. The temperature and dew point curves modify interpolating between the data points above and below the deleted point.	DR #1911
7.	Activate the sampling tool and hover the cursor on the Skew-T chart. Verify the following data from the original sounding is displayed:	The parcel data and graphical point data are displayed adjacent to the cursor.	DR #1910

Step #	Action	Result	Pass/Fail
	<p>Parcel Data</p> <ul style="list-style-type: none"> <li>- Pressure (mb)</li> <li>- Height (m and ft)</li> <li>- Temperature (C and F)</li> <li>- Dew Point Temperature (C and F)</li> <li>- Wind direction (degrees) and wind speed (kts)</li> <li>- u (m/s)</li> <li>- v (m/s)</li> <li>- Theta (K)</li> <li>- Theta-e (K)</li> <li>- Mixing Ratio [w] (g/kg)</li> </ul> <p>Graphical Point Data</p> <ul style="list-style-type: none"> <li>- Pressure (mb)</li> <li>- Temperature (C and F)</li> <li>- Theta (K)</li> <li>- Theta-e (K)</li> <li>- Mixing Ratio [w] (g/kg)</li> </ul>		
8.	<p>In the Skew-T Controls window, add a point to the Skew-T by entering the following information under the Add/Change Point to Skew-T section:</p> <p>P: 525 T: 20 Td: -60</p> <p>Check the Celsius box.</p> <p>Then MB1 click the 'Add Point to Skew-T button.</p>	<p>A temperature and dewpoint points were added to the Skew-T.</p>	
9.	<p>In the Skew-T Controls window, lift a parcel using the mean temperature by MB1 clicking the 'Mean Temp' option and MB1 clicking the 'Lift Parcel' button.</p>	<p>The parcel line is drawn on the Skew-T using the mean temperature.</p>	DR
10.	<p>In the Skew-T Controls window, lift a parcel using a user selected level by MB1 clicking the 'User Select' option, entering a valid pressure level, and MB1 clicking the 'Lift Parcel' button.</p>	<p>The parcel line is drawn on the Skew-T using the user selected pressure level.</p>	
11.	<p>MB1 click on the Hodograph tab.</p> <p>Then zoom into the Hodograph.</p> <p>Then select MB1 on a point in the Hodograph, and drag to a new location.</p>	<p>The Hodograph point is moved.</p>	
12.	<p>Select and hold MB3 on one of the points on</p>	<p>The point is deleted from the Hodograph</p>	

Step #	Action	Result	Pass/Fail
	the Hodograph line. Then select 'Delete Vertex' from the menu.	line.	
13.	In the Skew-T Controls window, add a point to the Hodograph by entering the following information under the Add/Change Point to Hodograph section: P: 225 Dir: 240 Spd: 80 Check the m/s box. Then MB1 click the 'Add Point to Hodograph button.	A wind direction/speed point is added to the Hodograph.	
14.	Close the Skew-T tab.	The Skew-T tab closes. The Map tab displays.	
15.	Repeat steps 2-14 for a sounding from model data as requested via the Volume Browser.	The edits are successful (refer to the result column in steps 2-14).	DR #1963
End of Test			

**5.0 REQUIREMENTS VERIFICATION TRACEABILITY MATRIX (RVTM)**

Number	Description	Test Step(s)
CAVE_TO8_015	CAVE shall provide the capability to display a Skew-T product	1-2
CAVE_TO8_015.1	The Skew-T product shall contain Upper Air sounding data	2
CAVE_TO8_015.2	The Skew-T product shall contain a list of meteorological indices and associated values derived from the Upper Air sounding data	2
CAVE_TO8_015.3	The Skew-T product shall contain an inset map with the location of the plot origin	2
CAVE_TO8_015.4	The Skew-T product shall contain a 24 Hour Temperature Change chart	2
CAVE_TO8_015.5	CAVE shall allow the user to modify the Upper Air sounding	3
CAVE_TO8_015.8	CAVE shall allow the user to modify the temperature profile	3-4
CAVE_TO8_015.8.1	CAVE shall allow the user to modify the temperature profile using mouse button 1	4
CAVE_TO8_015.8.2	The modified temperature point shall find its resting place on a horizontal axis along its original pressure level	4
CAVE_TO8_015.8.7	CAVE shall allow the user to remove a vertex point on the temperature profile using mouse button 3	5
CAVE_TO8_015.8.8	The Skew-T temperature profile shall modify accordingly, interpolating between the point above and the point below a removed vertex point	5
CAVE_TO8_015.9	CAVE shall allow the user to modify the dew point temperature	6
CAVE_TO8_015.9.1	CAVE shall allow the user to modify the dew point temperature profile using mouse button 1	6
CAVE_TO8_015.9.2	The modified dew point temperature point shall find its resting place on a horizontal axis along its original pressure level	6
CAVE_TO8_015.9.7	CAVE shall allow the user to remove a vertex point on the dew point temperature profile using mouse button 3	6
CAVE_TO8_015.9.8	The Skew-T dew point temperature profile shall modify accordingly, interpolating between the point above and the point below a removed vertex point	6
CAVE_TO8_015.12	The Skew-T product shall contain a hodograph	2
CAVE_TO8_015.13	CAVE shall allow the user to modify the hodograph profile using the cursor	11
CAVE_TO8_015.14.3	CAVE shall allow the user to delete a point from the hodograph using mouse button 3	12
CAVE_TO8_015.16	CAVE shall allow the user to sample the data on the Skew-T	7
CAVE_TO8_015.16.1	The sample data shall display the parcel data for the level on which the cursor lies	7
CAVE_TO8_015.16.2	The sample data shall display the graphical point data for the level on which the cursor lies	7
AWIPS_TO8_029	AWIPS shall contain a library of functions in the D2D meteolib baseline with APIs	1-15