AWIPS-2 Familiarization and Job Sheets

These instructions are designed as a series of task sheets to be completed on an AWIPS CAVE Workstation. There are 6 Task Sheets addressing various areas of functionality associated with manipulating the D2D. Once this familiarization is complete, you should be able to operate the D2D such that all subsequent tasks required of you throughout the course can be completed with relative simplicity. After completion of these Task Sheets, you should be able to demonstrate proficiency in these or any closely related tasks as requested to either the Science and Operations Officer (SOO) or an appropriate substitute evaluator.

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It is the intention of these tasks and this course to further your understanding of the NWS and the systems we use. If at any point you are confused, please feel free to ask for clarification. For the most part, if time permits, there are no restrictions to navigating the D2D itself, especially if the tasks outlined below have discussed the options and you would like to explore them further. *However*, there are buttons, widgets, and options, especially on the main AWIPS menus, that should not be accessed unless you are told to do so by the person training you. If in doubt, ask your supervisor.

The amount of time you will spend on these Task Sheets will vary depending on your familiarity with similar systems, but may take as much as a couple of hours. Once you have completed all of the requirements, let your supervisor know. If at that time you are comfortable with the D2D and would like to try more elaborate manipulations than are outlined below, make sure you first seek approval from the shift supervisor.

Task Sheet 1: AWIPS D2D Workstation Familiarization

Task Sheet	Description
A. Introduction	The AWIPS workstation includes two graphics displays and a text display. These displays share a keyboard, a three-button mouse, and a CPU. Mouse buttons will be referred to as MB1, MB2, and MB3, from left to right. MB2 will be a scroll wheel that can be clicked in the new configuration.
B. Logging out and in	Please work with your mentor and have him/her login to AWIPS for you.
C. Starting the D2D	To start CAVE, in the top left of the screen, click with MB1 on the Redhat "Applications," a menu will expand. Mouse over "AWIPS Menu" from the list and select with MB1 on the "Launch TextWS left monitor", "Launch CAVE middle monitor", and "Launch CAVE right monitor" icons separately. If D2D does not open inside of the CAVE, you may need to click on the blue and yellow icon in the top right of the window and select "D2D".
D. Layout of the D2D	The first row of labels along the top of the Cave display is the Menu Bar. Graphics and image products are available from the pull-down menus. The second row of labels is the Toolbar which contains menu buttons and option menus for manipulating displayed data. The default display consists of five panes, or windows. Each pane is independent of another (i.e., a loop can be running in one while another is stationary). Any product that is selected will appear in the large pane. To switch between the large pane and one of the four smaller panes on the left, click quickly on one of the small panes with MB3. Or, click and hold with MB3 over one of the small panes and select **Swap with Large Pane**.

Task Sheet 2: Menus and Toolbar

Task Sheet	Description
A. Pull-Down Menus	Pull-down menus are opened by selecting any menu in the Menu Bar with MB1. Select each menu in the Menu Bar to get an idea of what each menu contains. To close the menu without selecting anything from it, click anywhere outside the menu.
B. Cascading Menus	A few menus lead you to other menus; these are indicated by a right-pointing arrowhead located to the right of a menu item. Try clicking on a few of these with MB1.
C. Tear-Away Menus	To detach a menu from a parent menu, click on the dashed line at the top of a menu with MB1. This will bring that particular menu up in a separate window. This menu can be moved, resized, and closed. To move a tear-away menu, hold the title bar with MB1 and drag the menu to a new location. Try this a few times.
D. Option Menus	Option menus are denoted with a small rectangle in the menu button. For example, along the Toolbar, notice the scale option menu, which is currently selected as **CONUS**. Click on the menu with MB1 and notice the options. Make sure your D2D screen is blank by clicking **Clear** with MB1 on the Toolbar, and then try selecting different scales with MB1 to see how the map background changes. The **Frames** option menu changes the number of frames in a loop.
E.1 Toolbar Options	Ensuring you are on a **CONUS** scale, click on the **Satellite** menu with MB1 and then select **GOES-16 and GOES-17**, and then **Imagery Channels**, and then **East CONUS**. Select the 10.33 um Clean Window IR Band (ch. 13). On the Toolbar, adjust the number of frames to 20. Click on the forward arrow, >, on the Toolbar to step through the sequence. Click on the back arrow, <, to step back through the sequence. The two arrows on either end, |<< and >>|,

	go to the first and last frames respectively. Click on the circle to the right of the >>| button and notice that it has begun to loop.
E.2 Toolbar Options	**Clear** the display. Change the scale to **Regional**. Click on the **Obs** menu and select the first option under **METAR**, *Station Plot*. Notice that the latest METAR observations have been plotted. If only one or two stations appear, click on the back arrow, <, to go to the previous hour. On the Toolbar, on the **Mag** option menu, choose different magnifications and note the differences. Do the same with the **Density** option menu.

Task Sheet 3: Basic Product Displays and Manipulations

Task Sheet	Description
A. Loading Images and Overlaying Graphics	**Clear** the display. Change the scale to **State(s)**. From the **Satellite** pull-down menu, select **GOES-16**, and then **Imagery Channels**, and then **East CONUS**. Select the 10.33 um Clean Window IR Band (ch. 13). From the **Obs** menu, load the *Station Plot* and the *Ceil/Vis Plot (agl)*, available under **Other Plots**.
B. Toggling Overlays	*Make sure "Num Lock" is ON! The "0" on the numeric keypad toggles the displayed image. The keys 1-9 toggle the first nine overlays from bottom to top, while "Shift" pressed with keys 0-9 toggle overlays 10-19. Try toggling the Satellite image on and off this way, as well as the two plots. In addition, clicking on the product name on the lower right hand corner of the main display with MB1 will toggle the image or overlay on and off.
C. Zoom and Pan	To zoom in, scroll the MB2 mouse wheel forward. To zoom out, scroll the MB mouse wheel backward. To pan a zoomed image, click and hold with MB2 (or MB1), and drag the mouse in any direction. Release MB2 (or MB1) when you are satisfied with the location.
D. Changing Colors	**Clear** the display. Change the scale to **Regional**. Click on the **Obs** menu and select *Station Plot*. Press and hold MB3 on the METAR legend on the lower right hand corner of the display and note the options – note that you can change the magnification and density from this menu. Move the pointer up to **Change Color** and choose a different color.
E. Changing Line Width/Style	**Clear** the display. Click on the **Local** Menu. Under the **LAPS/MSAS Analysis** Cascading Menu, choose the **MSAS (MAPS)** Cascading Menu, and select *Temperature* (under Analyses). Click and hold with MB3 on the MSAS Surface Temperature legend, and change the **Line Style**. Adjust the **Line Width** as well. Do not clear the display.

F. Loading an Image	With the MSAS temperature still on the display, click and hold with MB3 on the legend, and choose **Load as Image**. Notice how the data have become colored. You can now click with MB3 on the MSAS Surface Temperature legend (not the image legend) and choose **Unload**. Notice now that the contours are gone, but the colored data remain.
G. Changing Map Colors	The background map *may* now be difficult to see with the image. On the numeric keypad, press **Enter**. Notice now that you see "State/County Boundaries" on the lower right. Click and hold with MB3 over the map legend and change the color. Press **Enter** a couple more times to return to the Product Legend. (Try looping through the temperature if you'd like to see how it's changed over the past few hours.)
H. Maps	**Clear** the display, and change the scale to **WFO**. From the **Maps** Pull-down menu, load *Interstates, Cities,* and *County Warning Areas*. Press **Enter** on the numeric keypad to change to the map legends. Try changing the colors of the map backgrounds so that you can better see what is displayed. **Clear** the display, and change the scale to **State(s)**. From the **Maps** Pull-down menu, load the *HiRes Topo Image* and the *Interstates* (you may want to change the color on the interstates). Feel free to load the topo image on a different scale if you'd like.
I. Manipulating Data	**Clear** the display, and change the scale to **CONUS**. From the **Volume** Pull-down menu, choose the *GFS20* family. Note the options that are displayed. Try looping through the data, toggling different overlays on and off, displaying different products as images, changing the line colors and styles, loading background maps, etc. After loading a product as an image, click and hold on the image with MB3 and choose **Sample**. What does this do? _____.
J. Fading Between Images	**Clear** the display, and change the **Scale** to **WFO**. From the **krax** Pull-down menu, select *0.5 Z/SRM8*. This will load a combined image of 0.5° reflectivity and 8-bit storm relative velocity. Press and hold the + and – keys, one at a time, on the numeric keypad, and notice how the image fades from the

	reflectivity product to the SRM product. If you toggle the "**.**" or **delete** key on the number pad, this will also alternate between products.
K. Radar Four-Panel Display	**Clear** the display. From the **krax** Pull-down menu, go down to the **krax four panel** (near the bottom) Cascading Menu. Check with your supervisor to determine which four-panel product would be best to load given the current Volume Coverage Pattern (VCP; i.e., 12, 21, 121, etc.) of the radar (some of them will have missing data in different VCPs). Load the product. Notice that the cursor is linked in all four panels. If you zoom in on one panel, the other three zoom. If you load a map, notice that it will load in all four panels. To load something to only one panel, place the pointer in the panel of your choosing. Click and hold with MB3 on the display and select **Load to This Panel**. Notice the large yellow **L** that has appeared on the lower left corner of that panel. You can now overlay anything on that panel, and it will only load to that particular panel. Repeat the **Load to This Panel** for the other panels to overlay different products on the other panels. See part H for map ideas; what map products may be of use to a forecaster in a severe weather situation? Feel free to load other four-panel radar products to see what's available.
L. Panel Combo Rotate	While in four panel display mode for any product, the number keys **1, 2, 3,** and **4** can be used to zoom in on a panel and make it full screen (but not the number keypad). In this mode, **1** refers to the upper left panel, **2** the upper right, **3**, the lower right, and **4** is the lower left (i.e., clockwise; this is a bit counter-intuitive as our method of reading suggests that **3** should represent the lower left panel and not the lower right). In this mode, the **Backspace** key and the **Delete** Key can be used to cycle backwards (counterclockwise) and forwards (clockwise) through the panels, respectively. While zoomed into a panel the **End** key can be used to zoom back out to four panel mode.
M. Interactive Points and	Points can be accessed by pressing the button with three dots on it on the toolbar or by accessing **Points** under the **Tools**

Baselines	Menu. Set the scale to State and load **METAR Station Locations** under the **Maps** menu. Load **Points** using one of the two methods above. You will probably see that some points are aligned with specific METAR sites. You can click and drag any point to a location of your choice. This is useful when accessing model forecast soundings from the volume browser (more on this later). **Baselines** are equally useful and can be accessed on the toolbar with the button depicting three diagonal lines to the right of the **Points** button. **Baselines** can also be accessed through the Tools Menu. Load **Baselines** in one of the two methods described above. Notice how you can drag the endpoints of the lines to adjust the length and the orientation of the line. This is useful for loading products such as radar reflectivity cross sections.
N. Volume Browser	The **Volume Browser** can be accessed through the **Browser** option under the **Volume** Menu. The volume browser is an extremely useful GUI used to load various types of data into D2D in a number of useful formats, especially model data. In this example we will load a GFS model sounding located at RDU airport into D2D. First, using the method described in **Interactive Points and Baselines** above, assign a point to the RDU airport. Next, open the **volume browser** and change the pull down menu in the toolbar from **Plan View** to **Sounding**. Select the **GFS20/GFS20-CONUS** model from the **Volume** Menu. In the **Thermo** menu, select **Sounding**, and then select your point in the **Points** under **D2D Points**. Make sure the product is highlighted in the **Product Selection List** and click **Load**. The volume browser can be used for other types of data besides model data. Next, we will try loading a radar reflectivity cross section through the volume browser. First, load a **KRAX** reflectivity product of your choice. Next, use **Baselines** to position a line through reflectivity returns of your choice. Remember the letter of the baseline used. Next,

	open the **Browser** from the **Volume** menu. Change the pull down menu in the toolbar to read **Cross section**. In the **Sources** panel, select **Radar** from the **Volume** menu. In the **Fields** panel, select **Reflectivity** from the **Other** menu. In the **Planes** panel, select your baseline from the **Specified** menu. Make sure the product is highlighted under the **Product Selection List** and press **Load**. The cross section will appear in the D2D window. Load the cross section as an image for optimal viewing. (**Note**: Viewing reflectivity data may be difficult on a clear day.)

Task Sheet 4: Procedures

Task Sheet	Description
A. Opening Procedure Bundles	**Clear** the display. Click on **File** with MB1, and choose **Procedures**, then **Open**. Click on the radio button "Show All Users". Scroll down to **USER- wforah** and click the triangle next to the username to expand the menu and display a list of procedure bundles. You will need to scroll up or down to view the whole list.
B. Selecting a Procedure	Select a procedure bundle by clicking on the name with MB1 and then clicking the **OK** button. Select **9__a. Winter WX.xml** and click **OK**. Notice that another window has opened.
C. Loading from a Procedure	This is a procedure that is routinely used during winter weather forecasting. Click on any of the bundles and the data will load in D2D. If you'd like, try out different procedures in the **USER- wforah** account. Specifically, try out the **0 RAH A2 HARDCOPY** Procedure. Glance through those procedures, and try loading a few of the maps in the list. Notice that instructions are listed in the procedure as to how to print the more common maps. You will likely be required to print and analyze some of the maps listed there, as surface and synoptic maps are an important component of WFO Raleigh's forecast process. Upper-air synoptic maps are usually analyzed at least once per day, and surface maps are typically analyzed once per shift.
D. Different User Accounts (Optional)	Later in the course, you may be asked to load procedures from a certain person's user account. At this point, if time permits, feel free to select different users and see what is available under those different accounts. Be careful not to make any edits, changes, or deletions to any of these user accounts. If you do so by mistake, be sure not to save any accidental changes you have made.
E. Using the	The meas account is for NCSU Interns. Click on **File** with

meas Procedure	MB1, and choose **Procedures**, then **Open**. Click on the radio button “Show All Users”. Choose **USER-meas** and click the triangle next to the username to expand the menu and display a list of procedure bundles. You may need to scroll up or down to view the whole list. Select the **STUDENT_INTERNS** procedure and click **OK**. The procedure is now open. You may select any of the procedures by either ‘double-clicking’ on a procedure, or ‘single clicking’ a procedure and then hitting the “Load” button. In the **STUDENT_INTERN** procedure you will find many useful procedures. The first several procedures are set up so that you can print out surface and upper air maps for data analysis. If you stretch out the procedure pop-up window you will find instructions on how to correctly print the different surface and upper air maps.
F. Creating a Procedure	**Clear** the display. From the **File** Pull-down menu, select the **Procedures** Cascading Menu and select the **New** option. Notice the empty procedures window. From the **File** Pull-down menu, select **History List…**. Any bundle that has been loaded on this particular workstation will be listed. On the **CONUS** scale, click on the **Satellite** menu with MB1 and then select **GOES-16**, and then **Imagery Channels**, and then east **CONUS**. Select the 10.33 um Clean Window IR Band (ch. 13). Overlay the *Station Plot* and *Lightning -> NLDN-> 15min plot* (both under the **Obs** menu). Feel free to change the color, density, and magnification of either of these two overlays. Set the frames count to 12. Notice how these have now appeared in the **History List**. **Clear** the display. Under the **Upper Air** menu, load the latest *Greensboro (KGSO)* sounding. Also in the **Upper Air** menu, under the **US Eastern** Cascading Menu (you might want to tear this menu off), load the *KMHX*, *KRNK*, *KWAL*, and *KFFC* soundings. Again, feel free to change the colors if you’d like. Notice, too, how these are now in the **History List**. **Clear** the display. (If you would like to create a third bundle, feel free to do so with any product and overlays of your choosing.) Click on the *IR Window*, *METAR Station Plot* in the **History**

	List and click **Copy Out**. Notice how the bundle has now appeared in the blank **Procedure** window. Do the same for the soundings bundle (and your third bundle if you created one). Click the **Save As** button in the **Procedure** Dialog Box. Another Dialog Box will open; name your procedure **XXX** where xxx are your initials. Click **OK**, and **Close**.
G. Using Procedures and Renaming Bundles	Try loading your procedures to view them. Sometimes, though, if your bundles have several overlays, the names are quite long. Open your procedure, **XXX**. Click on either of the two sub procedures you created, and click on the **Rename…** button in the **Procedure** Dialog Box. Type a new name in the Dialog Box that appears, and click **OK**. If you want to change the name of your other Procedure(s), go ahead. You will need to save your Procedure again now that it has been modified, so click the **Save** button.

Task Sheet 5: AWIPS Local Applications

Task Sheet	Description
A. Introduction	There may be times throughout the course where you are asked, or required, to select items on the AWIPS Local Applications menu. To see the local applications, click with MB1 on the REDhat Applications icon, a menu will expand, click with MB1 on **AWIPS Startup Menu**, then select **Utility Applications** to display a list of applications to choose from.
B. Obs Plot	When working at the HMT/Intern desk, it is helpful to keep your situational awareness up on the current conditions in central NC. To see METAR observations in our CWA, click with MB1 on the REDhat Applications, a menu will expand, click with MB1 on **AWIPS Startup Menu**, then select **Public and Aviation Applications**, then select **Aviation Forecaster – Obs Plot**. A window will open; select **RAH Public All CWA NW to SE**.
C. Export Window Image to GIF File	The HMT/Intern unit archives the 12Z 24-hour precipitation image daily (there is a procedure under the wforah user account set up for this). To do this, select REDhat Applications, then select **AWIPS Start-up Menu** with MB1, **select utility Applications**, then select **Utility – Export Window Image (D2D, IFPS, etc) to PNG File** option is used. Click that option. Glance over the instructions, and **Cancel/Exit** when you are done.

Task Sheet 6: The Text Display

Task Sheet	Description
A. Logging out and in	Just as we logged out and in of the **Cave**, it is important to do the same with the Text Display. Make sure all applications are exited first, and then by clicking on the Main Menu (the Red Hat), select **Logout**. When the login screen appears, your supervisor will provide you with the NCSU login and password if you have forgotten it. Two applications should start automatically. One should be the **Monitoring Controller**. The other should be a **Text Workstation Control** Dialog Box and a **Text 1** window. The **Monitoring Controller** will not be discussed as part of the AWIPS Familiarization, but know that it is primarily used when editing and sending climate reports.
B. Text Windows	Four text windows are available for your use. The first one is already open on the screen; the other three can be opened by clicking on **Text 2-4** on the **Text Workstation Control** Dialog Box. These text windows will be where you will browse, read, and possibly edit text products. The first row of buttons on the text window is the Menu Bar, and the second row is the Control Bar. Glance through them quickly; these will be described further below.
C. Loading Text Products	To load a product, the product header must be typed in the **AFOS Cmd:** line. Each product is broken down into three parts with nine total characters (CCCNNNXXX), a Node (CCC), Category (NNN), and Designator (XXX) (this is true for all official products; however, work (WRK) products do not necessarily follow this rule; see section F below). The node is the central forecast office where text products are collected and stored. The Category is the name of the text product. The Designator is the site or area for which the text product applies. For example, the zone forecast product (ZFP) out of this office would have the command RDUZFPRAH. However, since we are located at RAH, we can drop the RDU in front, and type ZFPRAH in the command line. Try it. All products out of Wilmington and

	Morehead City will have RDU as the node (RDUZFPILM, RDUZFPMHX, etc). Columbia, SC, is the node for SC products. To load the ZFP out of Greenville-Spartanburg (GSP), type CAEZFPGSP. Similarly, for Roanoke, type WBCZFPRNK. You can get a good idea of which products come from where by selecting the **AWIPS Browser**. RDU is the default node when the window appears; try scrolling through the different categories, select one or two different ones, and notice how ILM, MHX, and RAH appear as the designators. To load the product and keep the **AWIPS Browser** open, select the designator of choice and click **Load and Continue**. Try different nodes, and different Origins. This will also give you an idea as far as how products are named. (Important products that you will use during the course are listed in section G.)
D. Versions	**Clear** the display. Load the ZFPRAH. Note the issuance time. On the Menu Bar, select **Version**, and select **Previous**. Now note the issuance time. Now select **Version**, **Next**. Note that you are back to where you started. **Clear** the display. Load MTRRDU. Select **Version**, **All**. The number of METARS from the RDU airport displayed is the total number stored in the database. This varies depending on the product; for products from other offices, only two versions are stored, but up to 30 products from our office can be stored.
E. Accumulate	**Clear** the display. Load MTRRDU. Toggle the **Accum** button on. Select **Version**, **Previous**. Notice that both METARS are now displayed. You can continue to accumulate previous versions up to the number of versions stored in the database. Toggle off the **Accum** button when you are finished.
F. Enter Editor	**Clear** the display. Although editing a product will not be will not be part of the AWIPS Familiarization, you will need to do this at some point. Pull up the WRKSYN, and press the **Enter Editor**. Note the options now available, but do not select anything. The node is listed as the **WSFO ID**. Also listed is the **Product Category**, as well as the **Product**

	Designator. There are also three **Addressees**: 000, DEF, and ALL. The products you will work with will either be addressed to 000 or ALL. If it is addressed to 000, then the product remains internal (i.e., it is released only to WFO RAH). If it is addressed to ALL, then the product is released to the world. All WRK products will be addressed to 000. There may be a time that you send out a product with, for example, a spelling error. In that case, you would have to correct the product. In the **BBB** option menu (where the default says **NOR**), you would choose **CCx** if this was the case. We will not worry about the other options for now. If you were ready to start editing the product, you would now select **Enter**. However, this will wait until you can be trained on the product itself, so select **Cancel** instead.
F(e). Create a personal WRK File	**Clear** the display. Select **Enter Editor**. Leave the first two columns (TTAAii, CCCC) blank, and all other presets the same. In the **Product Category** blank, fill in the identifier "*WRK*". In the **Product Designator** blank, fill in your three initials (i.e. Jimmy Bob Thornton = JBT). Toggle on the **000** Address. Select **Enter**. In the text box, type the message "*Hello World! This is my very own text workfile.*" Select **Save**, **Cancel**, and **Clear** the window. In the AFOS Cmd box, call up your personal "WRK _ _ _" text editor. Many forecasters find having one of these useful, especially when it comes to editing products that need to be later combined (e.g. AFDs).
G. Important Products	There will be several products you will need to know throughout the course of the semester. Some of the products you will just need to look up for reference, such as the ZFPRAH, AFDRAH, or RWRRAH, but some you will need to create, some you will need to edit, and some you will need to write using the data available. Try pulling up the following products; you will be required to write each of these at least once through the semester: WRKSYN - Synopsis (use surface and upper air analyses and progs as references for this product) The following are the products that you will be required to

	create at least once through the semester: RTPRAH – Regional Temperature and Precipitation Table HYDRAH – Hydrologic Observations RVDRAH – River and Lake Summary RR1RAH – Reservoir data RRARAH – Reservoir data CLIRDU – RDU Climate Summary CLIGSO – GSO Climate Summary CLIFAY – FAY Climate Summary