

## DISPLAY SYSTEM PRIORITIES

Version 7

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NOTE: items in bold face type are new or changed since the previous version of this document.

1. FUNCTIONS WHICH HAVE BEEN IMLEMENTED. The following functions have already been implemented:

1.1. TVLOD - LOAD MAP OR BASELINE-TIME ARRAY INTO IIS. This function will display a map or a baseline-time array by loading it into an image memory plane of the IIS. The user can specify the following options through use of the standard commands: memory plane to be loaded, subsection of the memory plane to load (can be done interactively on the IIS screen), subsection of the input disk map to load, skip factor in the X direction, skip factor in the Y direction, range of input map values to be scaled into 8-bit image plane values, presence/absence of wedge with tics and labels, presence/absence of image identification label. Also, the user has the option of interactively specifying the desired location for the wedge and/or image identification label.

1.2. TVDIS - CONTROL IIS DISPLAY OPTIONS. This task allows the user to do the following functions: (1) Select the desired display mode (Plane 1 or Plane 2 alone, sum or difference of Plane 1 and Plane 2, split screen, intensity/hue); (2) Modify transfer function; (3) Select color scheme (grey-scale, spectrum colors, contrasting colors); (4) Zoom/roam; (5) Blink Plane 1 and Plane 2; (6) Insert wedge. This task does not use standard commands. The VT-11 is used to display status information and menus of functions.

1.3. TVVAL - DISPLAY VALUE AND SKY COORDINATES OF MAP PIXEL. This program allows the user to move a cursor on the IIS. The map pixel coordinates and intensity value are dynamically displayed in the corner of the IIS image as the cursor is moved. When the user freezes the cursor by pushing on the data tablet pen, the sky coordinates are also displayed. This program does not use the standard commands since it has no inputs. This program gets the pixel value by reading it back from the IIS image memory. Thus, the reported value has limited precision. For baseline-time arrays, this program displays the antenna numbers of the baseline that the cursor is sitting on. Also, when the cursor is frozen, the time is displayed. When a wedge has been loaded with the image by the TVLOD program, TVVAL allows the user to point to the wedge to get a display of map values corresponding to points on the intensity or color scale. When used with a display of a baseline-time array, this could be used for finding a numerical value for a flagging level. (1 week assuming appropriate coordinate conversion routines are available) (DONE - using old catalog record format and old conversion routines.)

1.4. CURVAL - DISPLAY FULL PRECISION MAP VALUE AND SKY COORDINATES OF MAP PIXEL. This will be similar to the above function except that it will read the pixel value from the disk map. It will thus report the pixel value with full precision. (0.5 week) (DONE)

1.5. CLNMAP - SUBMIT CLEAN REQUEST. This task allows the user to submit a clean request. It uses standard commands and allows the interactive specification of cleaning boxes if the dirty map is displayed on the IIS. (Note: this program runs in DISPLAY. When the user types the GO command, it sends the clean request to a companion program that runs in GRIDER and that enters the request into GRIDER's queue.)

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2. IMMEDIATE PRIORITIES. The following are the functions to be added to the display system in the immediate future. The times in parentheses are estimates of the amount of work needed to implement the functions. Note that this does not include things like being interrupted to implement the new catalog record format or the capability to select disks for map input or output.

2.1. LABEL MAP IMAGE ON IIS. This will put tic marks and coordinate labels into a graphic overlay plane. (2 weeks)

2.2. SORTED BASELINE-TIME VISIBILITY DISPLAY. This will add the capability to do labelling on the time axis when a baseline-time array is displayed on the IIS. This will also add a capability to display the baselines with different sorted orders. The user will be able to point to a baseline and be told which baseline it is. (4 weeks)

2.3. DYNAMIC PROFILE PLOTS. This program will be similar to the IMPS cross section plotting program except that it will also dynamically display vertical cross section plots on the VT-11. When the program starts up, it will ask the user whether he wants horizontal or vertical cross sections. The plot will include a display of the statistics of the profile data. (2 weeks)

2.4. CALCULATE MAP STATISTICS. This program will calculate the sum, mean, and RMS of the map pixels within a rectangular map subsection. Inputs to the program will be through the standard commands. One of the commands will specify the desired subsection location. The user can supply coordinates to this command, or he can type an exclamation point to activate the interactive box specification on the IIS. When the GO command is given, the program will use the data from the disk map for doing the calculations. (1.5 weeks)

2.5. CALCULATE STATISTICS FOR BASELINE-TIME IMAGES. This program will be similar to the above program which calculates map statistics. However, this program will calculate the statistics separately for each baseline within the selected map subsection. This might be a separate program or an enhancement to the map statistics program. (1 week)

2.6. ARBITRARY ANGLE PROFILE PLOTS ON VERSATEC OR ZETA. This program will use the standard commands to allow the user to specify an arbitrary line in a map either by typing the coordinates or by interactively specifying the line on the IIS. When the user types the GO command, the request for the hard copy profile plot will be entered into a queue of "background" jobs to be done. The map data will be obtained from the disk and the output will be able to be sent to the Versatec or Zeta. The plot will include a display of the statistics of the profile data. (4 weeks plus the time needed to adapt the MAPCON system to control things in DISPLY)

2.7. LINE PRINTER DUMP. This program will use standard commands to specify a map subsection. The numerical map values will be put into a

file which is automatically spooled to the Versatec (or maybe the DEC-10 line printer). The user will be able to interactively specify the map subsection if the map is displayed on the IIS. This program will work on both ordinary maps and baseline-time arrays. (3 weeks)

2.8. HISTOGRAM PLOTS ON VT-11. This program will allow the user to interactively specify a box on the IIS screen. It will then use the videometer to calculate the histogram of the specified image subsection. The histogram will be plotted on the VT-11. (1 week)

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3. LOWER PRIORITY ITEMS. The following are additional functions whose priorities are yet to be determined:

3.1. BASELINE-TIME VISIBILITY DISPLAY FOR MULTIPLE SOURCES. This will be similar to the above function except it will allow data for multiple sources to be conveniently displayed. A single mapping request will produce a number of separate baseline-time arrays for all sources or for a specified list of sources. A program in the display system will then read these arrays and display them in their proper time location on the TV display. The user will then be able to position the cursor on different parts of the displayed image and get a read-out of which source is being pointed to. (??? weeks)

3.2. ARBITRARY ANGLE PROFILE PLOTS ON VT-11. This program will allow the user to interactively specify an arbitrary line on an image displayed on the IIS. The corresponding profile plot along this line will then be displayed on the VT-11. This will be done by reading the necessary pixel values back from the IIS refresh memory. It will probably take some tens of seconds to produce the plot. (3 weeks)

3.3. SPECTRUM PLOTS. This will be similar to the above two functions except that a point within an RA-DEC map will be specified and the frequency profile at that point will be plotted. (2 weeks)

3.4. X-V IMAGE DISPLAY. This will display an image on the IIS where one coordinate is a spatial coordinate and the other is velocity/frequency. (1 week)

3.5. RULED SURFACE PLOTS. (?)

3.6. MAP ARITHMETIC. (?)

3.7. CONTOUR PLOTS ON THE VERSATEC. This will basically be a conversion of the existing IMPS contour function. (4 weeks assuming we have the new catalog record format to deal with)

3.8. ADD CLEARING OF GRAPHICS PLANES TO TVDIS. The CLNMAP program leaves boxes stored in one of the graphics planes. It would probably be useful to be able to clear the graphics planes. (1 week)

3.9. IMPROVE TVL0D. This would add the capability to load maps with a logarithmic and/or inverted scaling from map values to 8-bit TV pixel values. Also, this would add the option of applying histogram equalization transfer functions. (??? weeks)

3.10. STAR LOCATION PLOTTING. This will allow plotting crosses on the IIS image display at locations specified in a disk file. This will be useful for such things as plotting the locations of stars on top of a displayed radio image. (1 week)

3.11. ENABLE/DISABLE LABELING. This will allow the user to turn

the IIS image labelling on and off. (Currently, the labeling can of course be effectively turned off by reloading the image with the labeling options set to NONE.) (0.5 weeks)