MEMO

TO   : Scientific staff

FROM   : Arnold Rots

SUBJECT   : Image display software in AIPS; DICOMED

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I have written three new verbs for AIPS that deal with image display : TVXFR, TVDICO, and TVMOVIE. They are incorporated in the TEST area AIPS as verbs T2, T3, and T4, respectively. T2 allows interaction with the TV from a TEK-4025 terminal, T3 is for making DICOMED pictures, and T4 loads spectral line channel maps from a map cube into mosaics and runs a movie.
To augment T3, I also have written some new tasks on the PDP 11/44 DISPLY (IMPS).

TVXFR (T2VERB)

TVXFR incorporates a fair number of TV functions. It puts up a menu on the 4025 screen from which items can be selected by moving the terminal cursor into the appropriate box with the 4 arrow keys, and then hitting buttons A or B on the track ball box. Button A will make the menu function act on TVCHANNEL 1, button B on channel 2. In the case of split screen functions the button selected channel appears at the left or at the top. Operational instructions appear as part of the terminal display and are updated when specific menu items are selected.
As far as the TV transfer function is concerned, there are two separate parts to it: the image enhancement and the color scheme. Both TV channels have their own three-segment image enhancement function. These can be activated, deactivated, reset, inverted, and modified by moving the two "kinks" around with the TV cursor; operation is very much like in IMPS. If DOCRT=1 (TVXFR's only input adverb) a graph of this enhancement function is displayed on the terminal. That is, if the terminal is equipped with a graphics option; such is only the case at the moment on the 4025 terminals connected with VAX#3. There are five choices of color schemes: the IMPS spectral colors, three contrasting color schemes, and grey scale. The color scheme is common to the two TV channels. When one of the contrasting colors is selected, the X-coordinate of the TV cursor controls the the width of the color contours.
In split screen mode the TV cursor controls the position of the split.
The images in channels 1 and 2 can be arithmetically added (or subtracted if one of the enhancement functions is inverted), and the blue channel of the image display can be transferred to TV channel 3, and back to channels 1 or 2 if one wishes. Obviously this is only sensible if the grey scale is on. The purpose is to enable the user to do a quick-and-dirty map subtraction and look at the result more

closely. The transfer menu items only work if an ALU is present in the IIS, which at the moment is only the case for VAX#1.

If, for any reason the program might crash, you will usually get into a state where things do not respond as expected. Get out of this by typing :

ʌⱽWOR 0<CR>

TVDICO (T3VERB)

This verb stores an exact copy of the screen (including one graphics plane) in a file with the name OUTNAME (up to 8 characters; if you type more it. gets truncated) in a separate area. It only works if the IIS has an ALU (only on VAX#1 at the present time). If graphics plane 1 (plots) is on, it will be included in the image; graphics plane 2 (labels) will only be included if it is on while graphics plane 1 is off. Graphics information will always come out yellow on the DICOMED (also the labels!).

To retrieve this information and actually put it on the DICOMED go to the PDP 11/44 DISPLY (IMPS), and run DICAPE (see below).

TVMOVIE (T4VERB)

TVMOVIE loads 124x124 sections of map planes from a cube into sub-images on the TV (16 subimages per TV image plane). Each subimage is labeled with its third axis pixel coordinate; if the third axis in all probability is defined as velocity, the velocities are displayed. Then the movie mode is entered. By using the zoom feature a movie can be simulated under control of the trackball box: Button A alternates between still image and movie, Button C single steps through the subimage se-quence, Button B reverses the stepping and movie direction, and Button D exits, while the X-coordinate of the TV cursor controls the movie frame rate. A maximum of 16 * (number of IIS image planes) subimages can be used simultaneously (i.e.: 48 subimages at the moment).

T4 can be reentered in movie mode (without reloading) by setting SCALR2 to the number of subimages that are already loaded. If SCALR2=0, a reload takes place.

Note that this verb can also be used to generate mosaics of 16 spectral line channel maps (or L-V plots) per picture, to be sent to the DICOMED. By further mosaicing in DICAPE, one can (if one cares to) cram 96 subimages into a 35-mm frame.

DICAPE

The philosophy is that by typing :

run dicape

on the PDP 11/44 DISPLY (IMPS) console, one can do a complete session of DICOMED recordings. The program first exposes a frame with your name and address (with text strings provided by you), and then passes control to a task AIPSD2 that does the actual recording. It asks you for the computer the images reside on (one of the three VAXes) and whether you want black-and-white processing; the latter should ONLY be selected if your IIS images were B/W AND you have B/W film in the film transport. After this the program starts working on 35-mm frame after 35-mm frame until you have had enough.

To give you some flexibility in composing your pictures, each frame is subdivided in six or four "quadrants" according to the attached chart. You are asked for the number of images you want in the frame, in which quadrants you want them, and whether you want to add a caption. If only one image is specified, it is automatically put in quadrants 7, 8, 9, and 10, or (if a caption is to be added) in 2, 3, 5, and 6. Images can, if so desired, be recorded with a white border around them. If a caption is requested you are asked for the quadrants you want to put it into. The only constraints are that the caption area is a rectangle, is contiguous, and does not overlap with quadrants devoted to images. Within these limitations mixing of 1-6 and 7-10 is allowed. Finally, caption text can be centered in the caption area; the alternative is left/top justified.

The program will first record the images; you will be asked for the name (OUTNAME in T3) of each. If the file cannot be found you can either quit or continue with the other quadrants (if any) in the picture.

The caption can consist of up to ten lines of text. Each line is entered as :

nCSSS...S

where n is the letter size (1 through 9), C the color (the first letter of White, Blue, Cyan, Green, Yellow, Red, or Magenta; upper or lower case), and SSS...S the text string you want to be recorded. One quadrant width can hold about 20 characters of size 1, and one quadrant height 10 line of size 1; for different sizes, divide these numbers by the size. If the caption area is full before you get to 10 lines, the program will assume that that is all. Blank lines can be inserted by only specifying the size. You can finish by entering only a carriage return (or a size of 0). Frames exclusively containing text can be generated by specifying 0 images.

When one frame is done the program starts over again if you want to record more frames.

The rule for yes/no questions is that no is always the default. Typing "Y" or "y" means "yes", everything else means "no".

AIPSD2

If you want to record images, but not write a name-and-address frame (e.g.: if, after you wrote that slide, you were interrupted, or DECNET appeared to be down, or you want to add images generated on a different VAX), type :

run aipsd2

For instructions, see under DICAPE.

DINAME

If you only want to write a name-and-address frame (e.g.: your images are in IMPS, but you do not want to compose this frame using the DICOMED text menu item), type :

run diname

For instructions, see under DICAPE.

DIHEDR

If you put in a new film in the film transport, please fire up the DICOMED and type :

                                    run dihedr
This puts a header frame on the film, so that it is clear where the film came from.

Film Transports

We now have a second film transport. Number 1 will always be loaded with VLA-provided Ektachrome 64, number 2 can be used for private film and black-and-white.

The position of the ten quadrants in the 35-mm film frame is as follows :