NOAA Technical Report NESDIS 59

INTERACTIVE DIGITAL IMAGE DISPLAY AND ANALYSIS SYSTEM (IDIDAS) USER'S GUIDE

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NESDIS 24 Satellite-Derived Moisture Profiles. Andrew Timchalk, April 1986. (PB86 232923/AS)

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ABSTRACT

A sophisticated satellite image display and analysis workstation known as IDIDAS was developed by NESDIS personnel in response to a need for near real-time monitoring of environmental events occurring in the United States coastal waters. Efficient programming software is merged with an inexpensive personal computer attached to a high resolution color display monitor which gives users the ability to analyze, display, and manipulate digital high resolution imagery obtained from the NOAA series polar orbiting satellites.

The purpose of this User's Guide is to explain and simplify all IDIDAS commands and functions. We follow a logical sequence of describing the hardware and software necessary for operation, and then describing the systematic process of loading, georectifying, and analyzing satellite imagery. Ancillary functions are also explained.

ACKNOWLEDGEMENTS

Special recognition is hereby given to Kim Buttleman and Richard Garey, NESDIS Interactive Processing Branch, for developing IDIDAS, and modifying the software to make it efficient and user friendly. Kim Buttleman and Richard Garey provided documentation on IDIDAS software, and Bill Smith, Planning Research Corporation, provided documentation on the Turbidity software. The authors are indebted to these individuals.

ADDENDUM

IDIDAS software can be obtained by contacting:

Richard Garey
NESDIS E/SP22
Interactive Processing Branch
NOAA Science Center
Room 510
5200 Auth Road
Camp Springs, Maryland
20748

1.0 INTRODUCTION

This User's Guide is intended to make all functions of IDIDAS relatively simple and easy to use. All windows will be explained in detail and any special steps pointed out.

All software described in this document has been developed by NOAA/NESDIS Interactive Processing Branch (IPB) for use on an IBM compatible personal computer equipped with a Number Nine Corporation Revolution 512x32 graphics board.

The initial concept for a PC based image processing system began in 1986 when NOAA/NESDIS Satellite Services Division (SSD) staff was looking at ways to display high resolution digital satellite imagery inexpensively by using a personal computer. The Number Nine Corporation graphics board was selected for use with an IBM based computer and a high resolution monitor. Image processing and analysis software was developed, and before long, an analyst could display satellite data on a high resolution monitor using a personal computer at low cost compared to other existing image processing systems.

1.1 SOFTWARE

IDIDAS software is used to load, display, georectify and analyze satellite imagery. Most of the software is written in 'C' programming language for efficiency, ease of programming, and conservation of disk space. Other commands and routines written in other languages will be eventually converted to 'C'.

The Number Nine Corporation graphics board also requires certain software to run properly, and should be supplied with the board when purchased.

1.2 HARDWARE

Existing hardware is configured around the Number Nine Corporation Revolution 512x32 bit graphics board. Presently we suggest an IBM compatible AT machine with a high resolution monitor.

1.2.1 MAJOR COMPONENTS OF HARDWARE

IBM Compatible PC-AT, DOS 3.0 or higher

RAM - At least 640K (prefer 1MB)

HARD DISK - 20MB minimum

GRAPHICS BOARD - Number Nine Corporation Revolution 512 x 512 x 32 Bit Graphics Board - REQUIRED.

HIGH RESOLUTION COLOR MONITOR - 512 X 512 RGB analog monitor

COMMAND MONITOR - CGA or VGA Compatible (with appropriate graphics board)

MOUSE DEVICE

MODEM - preferably high speed

Other nonessential but helpful pieces of hardware are:

DOT-MATRIX or LASER PRINTER

GRAPHICS PLOTTER

If users have access to NOAA's NAS9000 mainframe computer, we suggest purchasing an IRMA Emulator Board, Ethernet Board, or being connected to a network that has these options, so that users can download image files from the mainframe to their PC. (See Appendix 2).

1.3 HARDWARE CONFIGURATION

Activating the PC is simply a matter of turning on the power. On most PC's with hard disks, DOS usually resides on the C: drive. IDIDAS software will usually reside on the D: drive, but can reside on any drive the user specifies. It is recommended that all IDIDAS software be installed in a dedicated drive or directory.

1.3.1 FLOPPY DRIVE

There are one or two floppy disk drives on a PC. Most newer PC's only have one floppy disk drive, and may be either a 5 1/4" or 3 1/2" format drive. Disk capacity will most likely be 1.2MB for the high density 5 1/4" diskettes, or 1.44 MB for the 3 1/2" diskettes. Image data and software programs can be read into the PC or copied from the PC using floppy diskettes. The recommended procedure is to copy data to the

hard disk, and then access the hard disk for faster response.

1.3.2 HARD DISK

There should be at least one hard disk on the computer, and sometimes more than one hard disk is resident. Letter designators are assigned to the hard disks similar to floppy disks. The first letter designator for the hard disk would be whatever letter follows the last designator for the floppy disks. In most cases, the hard disks are usually designated C:, D:, etc.

1.3.3 DISPLAY DEVICES

1.3.3.1 COMMAND MONITOR

A standard color command monitor with a CGA, EGA or VGA graphics card is used to display IDIDAS commands or menus.

1.3.3.2 HIGH RESOLUTION COLOR GRAPHICS MONITOR

The high resolution color graphics monitor is used to display digital satellite images and associated graphics in conjunction with the Number Nine Board. The monitor should be a 512 x 512 RGB monitor compatible with the graphics board used. A recommended monitor is the Mitsubishi FA3425L9ATKL, or similar model. An NEC Multisync monitor may also work.

1.3.4 MOUSE ATTACHMENT

A mouse is used to move a cursor on the high resolution monitor to obtain image information, or to draw on the image. A bus mouse is preferred, but a serial mouse will work just as well.

1.3.5 PRINTER/PLOTTER

Accessories to the basic image display system are printers and plotters. An IBM-compatible dot matrix printer or laser printer can be used to print data files, images, texts, or other output. A Hewlett Packard 6-pen plotter or any other plotter which uses Hewlett Packard Graphics Language (HP-GL) can be used to output drawing files.

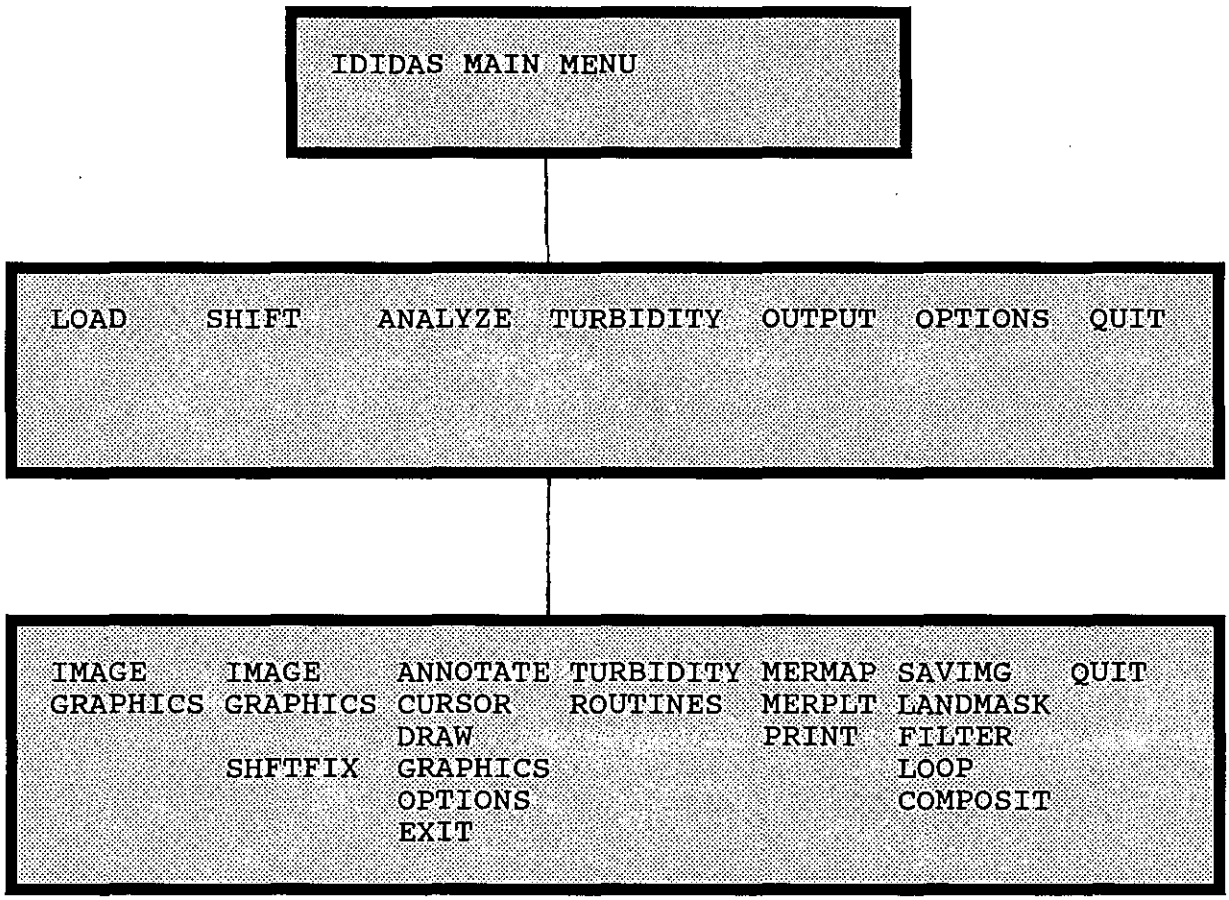
1.3.6 NUMBER NINE GRAPHICS BOARD

The Number Nine Corporation's Revolution 512 x 512 x 32 bit graphics card controls the display of an image on a high resolution monitor. Using the Mitsubishi monitor, the display is 512 columns by 480 lines. The board contains 1 MB of image RAM and additional memory for color tables. The 32 bit card is configured for one image frame (8 bits for each of the Red, Green, and Blue guns), and 8 1-bit graphics overlay planes.

1.4 SOFTWARE CONFIGURATION

For proper operation, the IDIDAS software must be configured with all IDIDAS programs in one directory (either the root directory, or a subdirectory). IDIDAS programs and driver batch files are listed in Appendix 1. An overview of the calling routines is listed below.

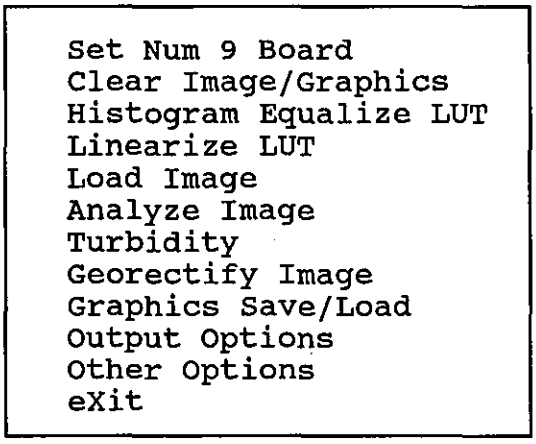
NOTE: BE SURE TO READ ID_SETUP.DOC AND IDCONFIG.DOC BEFORE ATTEMPTING TO USE IDIDAS 2.0.



2.0 IDIDAS SHELL

The easiest way to load and analyze a satellite image is to use the IDIDAS main menu, although you can also enter specific commands at the DOS> prompt. By typing IDIDAS, a window is activated, and appears on the command monitor. First initialize the Number Nine graphics board by selecting **'Set Num 9 Board'.** If you do not initialize the graphics board when you first turn on the high resolution monitor, the images will not load properly. Hitting the return key on the keyboard, or clicking the left mouse button will execute the **Set Num 9 Board** command. You can then load an image and execute other commands. Each command in the IDIDAS Main Menu is executed the same way as the **Set Num 9 Board'** is; by using the mouse or arrow keys to highlight the command, and then clicking the mouse button or hitting the return key on the keyboard to execute the command.

IDIDAS SYSTEM 2.0, by Interactive Processing Branch, NOAA



Use arrow keys or mouse to highlight an option.
Select highlighted option by hitting return key or mouse button.

2.1 SET THE NUMBER NINE GRAPHICS BOARD

Before the high resolution color monitor is turned on, the user should prepare the Number Nine Board for use by IDIDAS software. Preparing the Number Nine Board can be done two ways: Selecting **Set Num 9 Board** using the IDIDAS Main Menu, or by command input by typing **NSET** at the DOS prompt.

For more information on setting the Number Nine Board for display of satellite images, refer to NSET.DOC in the IDIDAS Documentation Files.

2.2 LOAD AN IMAGE

NOTE: Prior to starting **LOADIMG** the graphics board must be initialized with NSET (at the DOS prompt) or **Set Num 9 Board** (IDIDAS Main Menu).

The program **LOADIMG** reads an image file from disk and writes the data to the Number Nine Board. The program is started by either using the IDIDAS main menu or typing **LOADIMG** from the DOS prompt. A list of image files, or any file greater than 262 Kbytes from the current directory will now appear on the screen. By hitting the arrow keys or using a mouse, a user can highlight any name appearing on the screen, and by pressing the RETURN key accept that file name for loading into memory.

The header data from any highlighted filename can be displayed in a window by pressing a question mark (?) while in the **LOADIMG** routine. File names which do not have valid headers will be stated in a window. To continue with the selection of filenames, hit any key.

LOADIMG allows a user to load an uncompressed or compressed full (11 bit) resolution SSTMAP or IMGMAP image files or an 8-bit image or graphics file (saved from the #9 display using SAVEIMG) to the #9 board image display RAM.

Under normal circumstances, LOADIMG is used to load full (11-bit) resolution visible or IR SSTMAP or IMGMAP image files to the #9 image display RAM, loading the same image to the red, green, and blue image planes simultaneously, giving a grayscale image.

LOADIMG also permits a number of extended loading options. These include loading full resolution or 8-bit image files to a single image plane, with or without graphics, or using a visible channel lookup table, and loading 8-bit graphics files.

The default search path, menu color, and minimum and maximum temperatures for thermal image loading may be specified in the IDIDAS configuration file IDIDAS.CFG. See IDCONFIG.DOC for information on how to modify it.

LOADIMG may be used in <u>INTERACTIVE MODE</u> or <u>AUTOMATIC MODE</u>.

When used WITHOUT COMMAND LINE input, LOADIMG operates in INTERACTIVE MODE. The user is prompted to select an image (or 8-bit graphics) file to load, and is then prompted to choose the type of load, based on the type of image file chosen. When used WITH COMMAND LINE input, LOADIMG operates

in AUTOMATIC MODE. The user specifies the name of the file to load, along with the various load options appropriate for the file specified. The image (or 8-bit graphics file is then loaded, using the options specified.

Example: INTERACTIVE MODE

LOADIMG will display a list of image files (or any file larger than 262K bytes) from the default search path (drive/directory). By using the arrow keys or the mouse, a user can highlight any name appearing on the screen and by then pressing <ENTER> accept that file name for loading to the #9 board memory.

The header data from any highlighted filename can be displayed in a window by pressing the <?> key. File names which do not have valid headers will be noted in a window. Files which are 8-bit image or graphics files may be determined by looking at the file size in the header display. Eight-bit files without a header are 262144 bytes long, and those with a header are 262564 bytes long. To continue with the selection of filenames, hit any key.

The search path may be modified by pressing the <P> key. The current path is highlighted, and may be edited using the left and right arrow keys, <HOME>, <END>, <INSERT>, and <DELETE>. After editing the path, hit the <ENTER> key and available files in the new drive/directory will be displayed.

NOTE: The default search path may be specified in the IDIDAS configuration file IDIDAS.CFG. See IDCONFIG.DOC for information on how to modify it.

After a new list of images appears on the screen, the user can pick one by using the arrow keys. If the user is unhappy with this list, then the path may be edited again and another directory or drive specified.

The search wildcards may be modified by pressing the <W> key. Current wildcards are highlighted, and they may be edited in the same manner as the path is edited. After editing them, <ENTER> will display a new list of files which match the new wildcards.

If there are more than one screen full of names, using <PgDn> will go to the next screen. <PgUp> will go back to the previous screen.

After an image is selected, a menu will give the user a choice of the type of load desired.

Visible Image	(1)
Temperature Image	(2)
Other	(3)

LOADIMG reads the selected image file's header, and determines whether the image is a visible, thermal, or 8-bit image file, and automatically highlights the choice appropriate for the image.

If the image file selected is a visible channel image (AVHRR channels 1 or 2), then choice 1 (Visible Image) will be highlighted.

If the image file selected is an IR channel, then choice 2 (Temperature image) will be highlighted. If the image file selected is an 8-bit image or graphics file (as determined by the size of the file), then the program will automatically go to the extended menu, and choice 3 (8-bit image) will be highlighted.

The visible option will load an image with a linear gray scale. For temperature images (AVHRR Channel 3, 4, 5, or SST), Option 2, the user will be prompted to specify a minimum and maximum temperature range. The default minimum and maximum temperatures are specified in the IDIDAS configuration file IDIDAS.CFG. See IDCONFIG.DOC for information on how to modify them. Temperatures may be accepted as is by hitting <ENTER>, or they may be edited in the same manner as the path and wildcards are edited.

Temperature images will be loaded by converting the 11 bits of image data to 8 bits with all temperatures outside the range converted to black or white values. If an image is loaded and there is a lot of black or white on the screen, then an incorrect range of temperatures may have been specified and a reload of the image with a different temperature range may be desired. The IDIDAS.CFG file may need to be modified.

Choosing the Other option (3) provides an extended menu of load types. The expanded list includes the first two choices from above, and also an 8-bit image file load, 8-bit graphics file load, and two extended option loads for visible and temperature images. Eight-bit image and graphics files are produced using SAVEIMG.

Visible Image	(1)
Temperature Image	(2)
8-bit image	(3)
8-bit graphics	(4)
Visible image w/extended options	(5)
Thermal image w/extended options	(6)

Load types (3), (5), and (6) require specification of the image plane(s) to which to load the image. The user is prompted to choose the red (R), green (G), or blue (B) image plane, or all (A) image planes. The default is all planes.

Load types (5) and (6) requires the user to specify whether to load the graphics along with the image. This feature is useful when producing multispectral or multitemporal composite images. For more information, refer to the LOADIMG.DOC file.

Example: AUTOMATIC MODE

The user runs the LOADIMG program using a command line, i.e.

LOADIMG 5 TESTIMG.CH1 R Y CHANNEL1.LUT <ENTER>

This will load file TESTIMG.CH1 to the red image plane, with graphics using the CHANNEL1.LUT lookup table file.

Other command line options are:

LOADIMG or	
LOADIMG 1 filename	Load compressed/uncomp'd VIS image
LOADIMG 2 filename Tmin Tmax	Load comp'd/uncomp'd IR image
LOADIMG 3 filename [hue]	Load 8-bit image (w/hue option)
LOADIMG 4 filename	Load 8-bit graphics.
LOADIMG 5 filename hue gfx [LUTfile]	Load comp'd/uncomp'd VIS image w/hue, gfx & lutfile option.
LOADIMG 6 filename hue gfx Tmin TMax	Load comp'd/uncomp'd IR image w/hue & gfx.

The command line option was put in to be able to load images from a batch file, for example during a demo.

Where:

filename	Image or graphics file name.
Tmin	Minimum temp for thermal image load (floating pt, > -103.0 C)
Tmax	Maximum temp for thermal image load (floating pt, < 69.0 C)
hue = R	Load image to RED image plane
G	Load image to GREEN image plane
B	Load image to BLUE image plane
A	Load image to ALL (R, G, &B) image planes
gfx = Y	Load graphics.
N	Don't load graphics.
lutfile	Optional visible image lookup table file

2.3 GEORECTIFY IMAGES

Georectification routines can be activated either through the IDIDAS Main Menu or at the DOS prompt. Selecting **GEORECTIFY IMAGE** in the IDIDAS main menu activates a window which lets the user chose among three options.

2.3.1 SHIFTIMG

SHIFTIMG allows a user to interactively shift an image relative to the coastline and latitude/longitude graphics planes to georectify the display of a misnavigated image. The image may be shifted horizontally and/or vertically, and may also be skewed, allowing the top and bottom or left and right sides of the image to be moved relative to each other.

When an image is aligned with the coastlines, lat/lon coordinates derived from the image will be correct. Since drawings derived from an image are stored as lat/lon coordinates, imagery must be GEORECTIFIED (RENAVIGATED TO MATCH THE COASTLINE GRAPHICS) prior to any drawing files created from the image. Likewise, if a drawing file is made on one image and transferred to another image, the second image must also be GEORECTIFIED prior to display of the drawing file so that the accuracy of the latitude/longitude

coordinates are maintained.

When using SHIFTIMG, the georectification is only temporary, and must be done each time the image is loaded. Image files may be PERMANENTLY georectified using SHIFTFIX. SHIFTIMG may be used to determine the horizontal and vertical shift and skew offsets to be used by SHIFTFIX.

It is better to align the image as much as possible using SHIFT functions. If possible, SHIFT the image so that the center of the image is aligned with coastline graphics, and then go to SKEW functions as necessary. SKEWING essentially applies a skew to the image about the center row or column, depending on whether horizontal or vertical skewing is being performed.

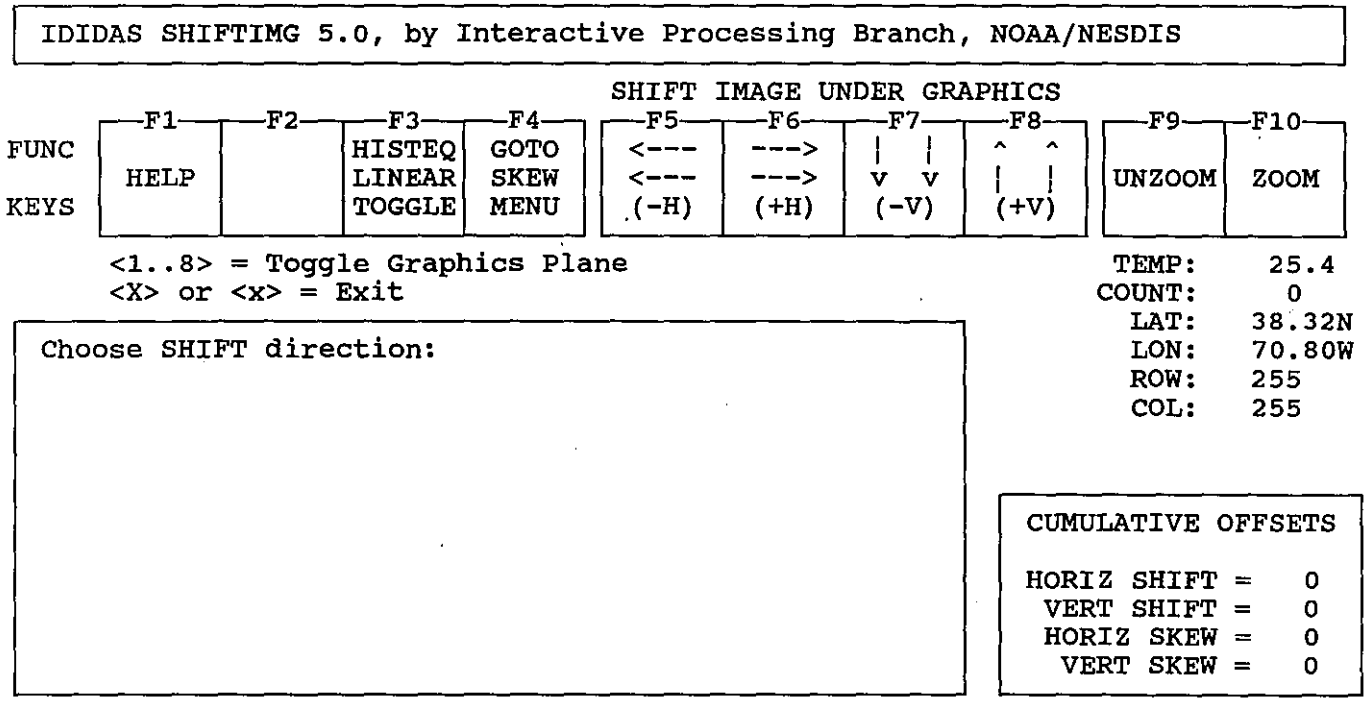
EXAMPLE: Skewing an image 5 pixels horizontally using function key <F5> on the SKEW menu moves the image top 5 pixels to the left and the image bottom 5 pixels to the right, leaving the center row unmoved. The image is divided into 11 horizontal bands (2*5 + 1). The top band is moved 5 pixels to the left, the 2nd band from the top is move 4 pixels to the left, ..., the 5th is moved 1, the 6th is not moved, the 7th is moved 1 to the right, ..., and the 11th is moved 5 to the right.

Shifting an image is additive. That is, shifting an image 4 pixels to the left and then shifting 3 more pixels to the left is the same as shifting 7 pixels to the left.

Skewing an image is NOT additive. Because of the way the image is divided into bands (according to the formula n*2+ 1, where n = number of pixels to skew), skewing an image 4 pixels and 3 pixels (in any direction) is not the same as skewing 7 pixels.

SHIFTIMG operates only in INTERACTIVE MODE.

SHIFTIMG displays the following menu screen:



The function keys are used as follows:

<F1> Print an onscreen help message.

<F3> Toggle between histogram equalization and linearization of the #9 board color lookup tables. Use this to alter the contrast of the image and allow easier alignment of the image coastlines with the graphics coastlines.

<F4> Go to the SKEWING function menu.

<F5> .. <F8>
Choose the direction to shift or skew the image under the coastline graphics.

<F9> UNZOOM the image.
<F10> ZOOM on the image. Use this to get a better look at the match of the image coastlines and the graphics coastlines.

<1..8> Toggle the respective graphics planes. Use this to get a better look at the match of the image coastlines and the graphics coastlines.
<ARROW KEYS> or MOUSE
Roam the cursor over the image.
<X> or <x> Exit.

Example:

Start the SHIFTIMG program by typing:
(or use the IDIDAS menus)

SHIFTIMG <ENTER>

Print the Help screen (If needed). At the main menu,
Hit <F1>

The lower left box will be overwritten with:

```
Correct misnavigated images by aligning the
   image with the coastlines.
Move the image under the coastlines by using
   the Function keys F5 .. F8.
Use F4 to go to the image SKEWING menu.
ZOOM with F10.  UNZOOM with F9.
Use the mouse to roam over the image when zoomed.
Use F3 to alter the contrast of the image.
Use SHIFTFIX to permanently georectify an image file.


 Strike any key to continue.
```

Shift the image 4 pixels to the left.
Choose the direction.

Hit <F5>

The lower left box will be replaced with:

```
Choose SHIFT direction:  LEFT

Enter the number of lines or columns
(from 1 to 9) to shift or skew the image:
Enter <ESC> to abort the choice.
```

Enter the number of columns to shift the image.
(Entry is restricted to values from 1 to 9.)
Enter: 4

The image will be shifted 4 pixels to the left. This takes about 15 seconds. The lower left box will be replaced with:

```
SHIFTING image LEFT 4 pixels
```

When the shifting is completed, the lower right box showing the

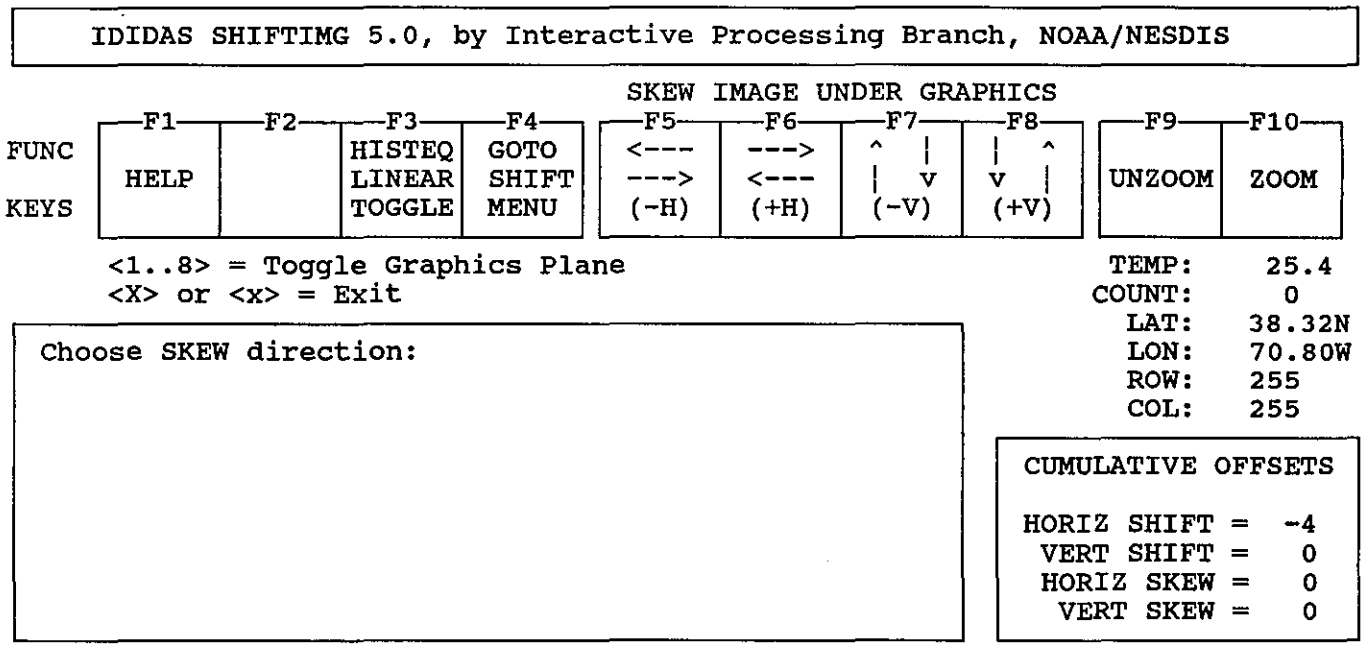
cumulative offsets will be updated.

```
CUMULATIVE OFFSETS

HORIZ SHIFT =  -4
 VERT SHIFT =   0
 HORIZ SKEW =   0
  VERT SKEW =   0
```

You will then again be prompted to choose a direction for shifting.

Use <F4> to go to the SKEWING menu.



Skew the left side of the image up and the right side down.
Choose the direction. Hit <F7>

The lower left box will be replaced with:

```
Choose SKEW direction:  Left UP, Right DOWN

Enter the number of lines or columns
(from 1 to 9) to shift or skew the image:
Enter <ESC> to abort the choice.
```

Enter the number of columns to shift the image.
(Entry is restricted to values from 1 to 9.)

Enter: 6

The left side of the image will be skewed up 6 pixels and the right side will be skewed 6 pixels down. The center column of the image is left unchanged, and the intermediate columns are skewed up or down according to how far they are from the center column.
This takes about 15 seconds.

When the skewing is completed, the lower right box showing the cumulative offsets will be updated.

```
CUMULATIVE OFFSETS

HORIZ SHIFT =  -4
 VERT SHIFT =   0
 HORIZ SKEW =   0
  VERT SKEW =  -6
```

Use <F3> to alter the contrast of the image. This may allow the user to better discern the image coastlines.

Use <F10> to zoom on the image, <F9> to unzoom.

Use the mouse to roam over the image when zoomed.

Use the <SPACE> key to toggle the graphics on and off. This may permit a closer look at the matchup between the image coastline and the graphics coastline.

Note the offsets for use by SHIFTFIX, if you wish to permanently georectify the image file.

When shifting is completed, exit the program:
Hit x or X

ADDITIONAL SUGGESTIONS:

Use <F3> to alter the contrast of the image. This may allow the user to better discern the image coastlines.
Use <F10> to zoom on the image, <F9> to unzoom. Use the mouse to roam over the image.
Use the <SPACE> key to toggle the graphics on and off. This may permit a closer look at the matchup between the image coastline and the graphics coastline.

2.3.2 SHIFTFIX

SHIFTFIX allows a user to PERMANENTLY correct the navigation of a misnavigated image file. The image (and selected graphics planes, if appropriate, of IMGMAP image files) may be moved relative to the graphics to align it with the coastlines or known latitude/longitude points and then may be saved as a disk file in the corrected format. The image may be shifted horizontally and/or vertically, and may also be skewed, allowing the top and bottom or left and right sides of the image to be moved relative to each other.

********** EXTREMELY IMPORTANT NOTE **********

Users should NEVER SPECIFY A GRAPHICS PLANE NUMBER CONTAINING the LATITUDE/LONGITUDE GRID or the GEOPOLITICAL BOUNDARIES (COASTLINES). These graphics should NEVER BE SHIFTED. The ONLY graphics data which should be shifted are MASK DATA, such as FILL-DATA MASK, or CLOUD MASKS.

WARNINGS

* This program uses the #9 image display RAM to shift images. The RAM will be overwritten, and the image monitor display will be erased.
* The #9 board must be active (NSET must have been run.)
* The input image file must be in the compressed data format.
* The shifted output image file will also be compressed.

When the image is aligned with the coastlines, lat/lon coordinates derived from the image will be correct. Since drawings derived from an image are stored as lat/lon coordinates, IMAGERY MUST BE GEORECTIFIED PRIOR TO ANY DRAWING FILES BEING MADE ON THE IMAGE. Likewise, if a drawing file is made on one image and transferred to another image, THE SECOND IMAGE MUST ALSO BE GEORECTIFIED PRIOR TO DISPLAY OF THE DRAWING FILE.

Displayed images may be TEMPORARILY georectified with SHIFTIMG. SHIFTIMG MUST BE USED TO DETERMINE THE SHIFT AND SKEW OFFSETS TO BE USED BY SHIFTFIX. They may be inserted into the command line, or may be inserted interactively. SHIFTFIX inserts the shift and skew horizontal and vertical offsets into the image header. When SHOHDR is used to display the header information for the image, or the image information query <?> is used in the IDIDAS File Requestor in LOADIMG, the cumulative shift and skew horizontal and vertical offsets will be displayed.

SHIFTIMG MUST BE USED TO DETERMINE THE SHIFT AND SKEW OFFSETS TO BE USED BY SHIFTFIX.

The georectification of an image DISPLAY done by SHIFTIMG is temporary. Georectification of an image FILE done by SHIFTFIX is PERMANENT. Therefore, a user should be very careful when determining the shift and skew offsets to be used by SHIFTFIX.

SHIFTFIX operates only in AUTOMATIC MODE, and may be used with or without a command line.

When used with a command line, the user specifies the name of the file to georectify and the horizontal and vertical shift and skew values in a command line. If the image specified is an IMGMAP image, appropriate graphics plane numbers may also be specified. The image is then loaded, shifted and skewed (with selected graphics planes, if appropriate), and saved automatically. This mode of operation is useful if several channels of an image have been generated from the same 1B data set, since all should be georectified the same.

When used WITHOUT COMMAND LINE input, the user is prompted to select a file to georectify, the horizontal and vertical shift and/or skew offsets, and graphics plane numbers if the image selected is an IMGMAP image. The image is then loaded, shifted and skewed (with selected graphics planes, if appropriate), and saved to disk file in the rectified format.

EXAMPLE: AUTOMATIC MODE.

NOTE: Use SHIFTIMG to determine the horizontal and vertical shift and skew offsets to be specified in the automatic mode.

Shift IMGMAP image file GSC89031.SST 5 pixels to the right (h_shift = 5), 3 pixels down (v_shift = -3), and skew it top to the left and bottom to the right 5 pixels (h_skew = -5). Shift the fill data mask plane (1) and the cloud mask plane (5).

At the DOS prompt, type:

SHIFTFIX GSC89031.SST 5 -3 -5 0 1 5 <ENTER>

The 11-bit image data will be loaded to the #9 RAM, georectified, and the altered image saved to disk in the georectified form. Then the graphics data will be loaded, planes 1 and 5 georectified, and then all graphics will be saved to the image file.

Command Format:

```
SHIFTFIX [drive][path][filename.ext h_shift v_shift
              h_skew v_skew] [gfxplane][gfxplane...]


   filename.ext = Name of image to be automatically
                  loaded to #9 board for georectifying.
        h_shift = integer # of pixels for horizontal
                  shift ( - = left shift,+ = right
                   shift)
      v_shift   = integer # of pixels for vertical
                   shift ( - = down shift, + = up shift)
       h_skew   = integer # of pixels for horizontal
                   skew ( - = skew top left & bottom
                   right; + = skew top right & bottom
                   left)
       v_skew   = integer # of pixels for vertical
                   skew ( - = skew left up & right down;
                    + = skew left down & right up)
       gfxplane  = number of graphics plane(s) to shift
```

Error Conditions:

If the IDIDAS environmental variables have not been set, a warning message will be displayed and the program will abort. See ID_SETUP.DOC for information on the procedure for setting these variables. If there is insufficient disk space to allow successful shifting of an image, a warning

message will be displayed on the screen and the program will abort. The user must delete files until at least 350K of disk space is available.

If the image selected is not compressed, a warning message will be displayed and the program will abort. Use program COMPRESS to reformat the image file from uncompressed image file format to the compressed image file format.

If the image has already been georectified, a warning message will be displayed on the screen and the user given the option of continuing or aborting the program.

If the image file selected is an SSTMAP image file and the user specifies one or more graphics planes to georectify, a warning message will be displayed and the program will abort.

2.3.3 RETURN

Selecting **RETURN** in the **GEORECTIFY** submenu returns the user to the IDIDAS Main Menu.

2.4 ANALYZE IMAGE

The ANALYZE Program can be executed in the IDIDAS Main Menu, or as command input at the DOS prompt. The start command is:

ANALYZE <RETURN>

If ANALYZE is started without the command line, overlay graphics plane 7 is used as the default drawing plane. Any drawing done will be saved under the default name IMAGENAME.DRW, where IMAGENAME is the prefix of the image name contained in the HEADER.TBL file. This way, corresponding drawings and images will have the same prefix name. The user can change the name prior to saving it, or hit the <ESC> key and nothing will be saved.

The command line format is :

ANALYZE (drawing file name) (drawing plane number)
<RETURN>

If ANALYZE is started with the command line, the user may specify either a drawing file name or a drawing plane number, or both. If no plane number is specified, plane 7 is used as the default. When another plane number is specified, drawing will be done on that plane. If no drawing file name is specified, the system will draw on the

plane specified and any drawing done will be saved under the default name IMAGENAME.DRW, or the user may change the name prior to saving it. If the command line uses the name of a drawing file that already exists, that drawing will be plotted over the displayed image in the image's map projection, and any new drawing done on that plane will be appended to that drawing file. If the drawing file name specified is of a new drawing file, any drawing will be saved under that name. In all cases, if no new drawing was done or the pre-existing drawing file was not edited or changed, the save will be skipped.

Users have the option of drawing on other planes from within the program. The active drawing plane number is highlighted on the monitor. When exiting ANALYZE, the updated drawing file can be saved.

2.4.1 ANALYZE MENU DISPLAY

Annotate Cursor Drawing Graphics Image Options eXit

FUNC KEYS	F1	F2	F3 -	F4 +	F5 -	F6 +	F7 -	F8 +	F9	F10
	HELP	EDIT	# OF COLORS		RANGE	TEMP	COLOR	WIDTH	UNZOOM	ZOOM

DRAWING	PLANE	COLOR	CONTENTS	CURSOR INFO	
MouseL ... Draw	1 ON	Blue		TEMP:	
MouseR ... Pen up	2 ON	Red		COUNT:	183
DELete last command	3 ON	Fuschia	coastlines	LAT:	35.09N
	4 ON	Yellow	Lat,Lon Grid	LON:	75.04W
TOGGLES	5 ON	Lt.Blue		LINE:	255
SPACE ... Colors	6 ON	Purple		ELEM:	255
1..8 ... Graphics	7 ON	Green			
0 ... Image	8 ON	Maroon	Cursor		

COLORS = 1 Min: 128 Max: 128 1 counts wide OFF

The PC system monitor continuously displays the ANALYZE command menu and image information. The menu screen is available in two configurations corresponding to the two styles of keyboards commonly available (i.e., function keys on left side of keyboard or along top of keyboard.) The screen is divided into five areas:

Command menus,
Function keys,
Drawing & toggle keys,
Graphics status information,
Image & cursor information.

In both configurations the top four lines of the menu are used for a nested command menu system. Below these (or on the left, depending on the menu configuration) is a diagram of the uses assigned to the keyboard function keys <F1> through <F10>. One section gives a brief synopsis of the image and graphics toggle keys, as well as the drawing command keys. Another summarizes the status, contents, and colors of the graphics planes. A further section contains a continuously updated (and highlighted) display of the cursor information.

2.4.1.1 CURSOR INFORMATION

Cursor latitude & longitude
Cursor row & column

The main menu screen displays the latitude and longitude as well as the row and column of the current cursor location. As the cursor is moved, the values of the latitude and longitude/row and column will be updated to reflect the new cursor position.

Pixel value or temperature

If the displayed image was loaded with the temperature option (2) of LOADIMG, then ANALYZE will display the Celsius temperature (and the count value in menu type (2) of the pixel at the cursor position.

If the displayed image was loaded with the visible option (1) of LOADIMG, then ANALYZE will display the count value stored at the cursor position.

NOTE: Menu type 2 also displays the temperature and count) values in the red, green, and blue image planes. Under normal use these will all be the same.

2.4.1.2 FUNCTION KEYS

<F1> - HELP

A help screen can be called at any time. The user will be asked to input the help screen desired. The HELP windows will provide information regarding option choices.

<F2> - EDIT

The current drawing file may be edited using commands available through the menu called by this key.

<MouseL> - Deleting a Line Segment

A drawing file may be edited by deleting an individual segment of a line in the drawing. Move the cursor within a few pixels of the line segment you wish to delete and press the left mouse button. The line segment will disappear, and the EDIT submenu will indicate that the deletion was successful. If the cursor was not close enough to 'grab' the line segment, the EDIT submenu will indicate that the cursor was not close enough to the line segment.

<MouseR> - Moving a Point

A drawing file may be edited by moving a connector point which joins two line segments. Move the cursor to within a few pixels of the connector point and press the right mouse button. The EDIT submenu will indicate whether the 'grab' of the point was successful. Once a connector point has been grabbed, it may be moved by moving the cursor, either with the mouse or with the arrow keys. As the cursor (and point) is moved, the two line segments connected to that point will blink and will follow the cursor. Hit either mouse button or <X> to stop the movement.

<B> - Box Delete

It is also possible to delete all parts of a drawing file inside a user defined box. To activate from within the editor, type <B>. First move the cursor to the upper left corner of the desired box and hit either mouse button. Next move the cursor until the blinking box encloses the desired area to be deleted. Finally press either mouse button to delete the area. The graphics plane will be cleared and the drawing file will be redrawn with the deletion.

NOTE: The only way annotation may be erased is with this option. Draw the box around the first letter of the annotation string. The entire string will be erased.

<ESCape> -- To return to menu level 0, hit <ESCape>.

<F3> & <F4> -- NUMBER OF COLORS

To increase the number of displayed contours, hit <F4>; to decrease the number, hit <F3>. From 1 to 14 color contours are available. The color sequence (from warm to cool or from low counts to high counts) is red, orange, yellow, green, blue-green, blue, purple.

<F5> & <F6> -- COLOR TEMP RANGE

To increase the maximum temperature (or minimum count value) of the count range that is color enhanced, hit <F6>. Hit <F5> to move the enhanced range in the opposite direction.

<F7> & <F8> -- COLOR WIDTH

To increase the temperature (or count value) range that is enhanced by each color, hit <F8>. Hit <F7> to decrease the range enhanced by each color.

<F9> & <F10> -- ZOOM LEVEL

Sixteen zoom levels are available. Zoom in by hitting <F10>. Zoom out by hitting <F9>. When the image is zoomed, it will roam under the cursor.

2.4.1.3 IMAGE AND GRAPHICS TOGGLES

<1>..<8> - Toggle Graphics Planes

Overlay graphics may be toggled off and on by hitting the corresponding number key. The menu screen displays the toggle status of the graphics planes. When the word ON appears, the graphics plane is on. A blank means that the plane is off.

Plane 1 is reserved for land/cloud masks or graphics fill options.
Plane 2 thru 7 can be used for drawings.
Plane 3 holds supplied coastlines.
Plane 4 holds supplied lat-lon grids or land masks.
The number of the currently active drawing plane is highlighted.
Plane 7 is the default drawing plane.
Plane 8 holds the cursor, and should not be used.

Plane	Reserved	Color	Use
1	Y	NA	Masks
2	N	Red	Lat-lon Grids
3	N	Fuschia	Coastlines
4	N	Yellow	Grids/Masks
5	N	Lt. Blue	
6	N	Purple	
7	N	Green	Default drawing
8	Y	Violet	Cursor

(Note: The graphics planes are arranged such that a

higher numbered plane overlays a lower numbered plane, and is, in effect, closer to your eye. Thus when a plane is toggled off, any graphics in an underlying plane will be revealed.)

<9> - Toggle all Graphics Planes

The nine <9> key toggles all the graphics planes on and off.

<0> - Toggle Image Plane

The zero <0> key will toggle the image display on and off.

<SPACEBAR> - Toggle Enhancement Colors

The <SPACEBAR> will toggle the color enhancement on and off.

Command Menu Line

Across the top of the monitor screen will appear seven primary options. These are:

Annotate **C**ursor **D**rawing **G**raphics **I**mage **O**ptions e**X**it.

The letter in the option which is capitalized is the keystroke used to activate that option. (Example: Type <C>. A window will open on the screen which will give the user a list of cursor choices. One option will be highlighted at first. To change the highlight, move the mouse up or down or press the up or down arrow keys. When the desired option is highlighted, the selection can be done by pressing a mouse button or the RETURN key. If there are letters or numbers on the right side of each row inside of parentheses, then that letter or number can be pressed to directly choose that option (no highlight is necessary).

Following is a description of all the options. Immediately below the primary option is a list of each secondary option which will appear in the window, with a brief explanation following.

2.4.2 ANNOTATE

(No secondary options)

Allows placement of a sequence of characters in the current drawing file. Annotation is stored as an ASCII string, with its location fixed by a lot/lon value for the first character in the string. The orientation and size of fonts

can be adjusted with both upper and lower case available.

2.4.2.1 ANNOTATION MODE

ANNOTATION MODE Size = Small Direction = H

Enter text string:

<BACKSPACE> over last character. <ENTER> text to screen.

Use arrow keys or mouse to move annotation box.
<ESC> = Exit Annotation Mode.

2.4.2.2 FUNCTION KEYS

F1	F2	F3	F4
HELP	CHANGE SIZE	CHANGE DIR	

Type the sequence of characters. As the characters are typed, a box on the high resolution monitor will appear and become larger or smaller, depending upon the number of characters and size of font. The location of the box can be adjusted by moving the mouse or pressing the arrow keys. The size of the fonts and the orientation can also be adjusted before the final RETURN key is pressed. When the text on the PC monitor and the size and location of the box on the high resolution monitor are as desired, press the RETURN key to finalize the characters on the screen.

Hit the <ESC> key to escape the annotation mode.

To erase annotation, use the BOX DELETE option of EDIT (<F2>). Draw the box around the first letter of a string. The entire string will be erased. It is not possible to erase a single letter in a string.

2.4.3 CURSOR OPTIONS

Annotate **Cursor** Drawing Graphics Image Options Exit

Array Toggle	(A)
Center Cursor	(C)
Speed Change	(S)
<ESCape>	

2.4.3.1 ARRAY TOGGLE

Toggles display of a 5x5 pixel array of temperatures or counts at the bottom left of the screen. The differences from the center pixel appear on the right. The cursor will move more slowly when the array is toggled on.

2.4.3.2 CENTER CURSOR

Centers the cursor in the middle of the screen

2.4.3.3 SPEED CHANGE

Allows modification of the cursor speed. If a mouse is being used the speed should be left at 1. If the cursor is being moved by the keyboard arrow keys, then this option can be used.

2.4.3.4 ESCape

Return to menu level 1.

2.4.4 DRAWING

2.4.4.1 USING THE MOUSE

Drawing is done using the mouse to move the cursor and raise and lower the pen. (On mouseless systems the arrow keys are used for cursor movement and the <HOME> and <PgUp> keys are used for pen down and pen up respectively.) Begin a drawing at the cursor position or extend a drawing to the cursor position by hitting the left mouse button <MouseL>. "Raise the pen" (that is, end a drawing segment) by hitting the right mouse button <MouseR>. The <DEL> key removes the last command entered in the commands. If drawing a line is in progress and <DEL> is hit, the last segment will be removed. If a line has been terminated with a "Raise the pen," <DEL> will remove the "Raise the pen" and allow extension of the line.

A drawing file produced with ANALYZE is immediately suitable for plotting with the program MERMAP, which prepares a drawing for output by the plotter. Program PRINTEMP will also read drawing files and output in ASCII form to a printer or disk file the latitude/longitude and temperature information at the line segment connector points.

Annotate Cursor **Drawing** Graphics Image Options Exit

```
Load Existing Drawing File  (L)
Edit Current Drawing File   (E)
Save Current Drawing File   (S)
Begin New Drawing File      (B)
Finish Current Drawing File (F)
<ESCape>
```

2.4.4.2 LOAD EXISTING DRAWING FILE

Allows a user to load a previously made drawing file from disk, with the option of appending or editing it, or quitting the file. (THE LAST DRAWING FILE LOADED IS THE CURRENT DRAWING FILE.) The IDIDAS File Requestor displays a list of available files which match the drawing wildcard specified in the IDIDAS configuration file IDIDAS.CFG. See IDCONFIG.DOC for information on the editing of this file. The File Requestor defaults to *.DRW.

```
Drawing File Load                <P> Changes Path
                                 <W> Changes Wildcard
                                  ? - header display
                                  ESC to exit

  CURRENT PATH -> C:\MSC
  WILDCARDS    -> *.DRW

E9122008.DRW      CWSCST.DRW      MI.DRW          XX.DRW
```

Both the path and wildcard parameters can be modified. After specifying a drawing file, the user is prompted to choose a drawing plane (1..8) in which to display the

drawing. This will then be the active drawing plane. The user is also prompted to choose whether to display the line segments as solid or dashed lines. Text is not affected by this option.

INPUT PLANE CHOICE

Plane 1	(1)
Plane 2	(2)
Plane 3	(3)
Plane 4	(4)
Plane 5	(5)
Plane 6	(6)
Plane 7	(7)
Plane 8	(8)

Drawing and editing can now take place in the drawing plane selected. The graphics status section of the main menu will also be updated, with the number of the active drawing plane highlighted, and the name of the drawing file which was loaded listed in the contents space.

After the drawing is loaded, the user will be asked whether he wants to add to or edit the file, or to quit the file. If the add/edit option is chosen, appending or editing of the file may be done. The graphics status section of the main menu will also be updated, with the number of the active drawing plane highlighted, and the name of the drawing file which was loaded listed in the contents space.

2.4.4.3 EDIT CURRENT DRAWING FILE

This option provides the same drawing edit functions as described under Function Keys <F2> in the Annotation section.

2.4.4.4 SAVE CURRENT DRAWING FILE

Allows the user to save the current drawing file to a disk file, with the option of continuing to edit the file or to quit the file. The name of the current drawing file will be displayed at the save prompt. If no name was given then the default name of IMAGENAME.DRW will be used, where IMAGENAME is the prefix of the image name (as contained in the HEADER.TBL file). The user may change the name prior to saving it. The user can hit the <ENTER> key to save under that name or may edit the displayed name. <ESC> bypasses the drawing file save. If the new name already exists, the user will be warned, and given the opportunity to overwrite the old file or to re-edit the name to a new one.

The user is then asked whether he wants to continue adding/editing the file, or whether he wants to quit the drawing file. The graphics drawn will remain displayed (until cleared).

2.4.4.5 BEGIN NEW DRAWING FILE

Allows a user to start a new file.

The user is prompted to choose a plane and to provide a name for a new file. If another drawing file is already being edited, the user will be prompted to save that file first, with the option of skipping the save.

2.4.4.6 FINISH CURRENT DRAWING FILE

Allows a user to save and quit the current drawing file. The name of the current drawing file will be displayed at the save prompt. If no name was given then the default name of IMAGENAME.DRW will be used, where IMAGENAME is the prefix of the image name (as contained in the HEADER.TBL file). The user may change the name prior to saving it. The user can hit the <ENTER> key to save under that name or may edit the displayed name. <ESC> bypasses the drawing file save. If the new name already exists, the user will be warned, and given the opportunity to overwrite the old file or to re-edit the name to a new one.

2.4.4.7 ESCAPE <ESC>

Return to ANALYZE menu level 1.

DRAWING NOTES:

Previously existing drawings may be modified or appended. If an old drawing file is loaded, it may be altered using the options within the EDIT (<F2>) menu or it may be appended by simply doing additional drawing.

Saving the altered file using the original name incorporates those changes into the file. Saving under a new and different name will preserve the original disk file under its original name and also save to disk the altered file under the new name.

More than one drawing file may be loaded to a particular graphics plane. However, the last drawing file loaded will be the current drawing file, and only this file may be edited or appended. This file is the one listed under "Contents" in the Graphics Status section of the menu

display. If more than one drawing file has been loaded to a single plane, there is no way to remove just one of the drawings. The plane must be cleared and the desired drawing(s) reloaded.

If an old drawing has been altered or a new drawing has been made, the user is prompted to save the altered drawing file before a second drawing may be loaded. <ESC> will skip the save.

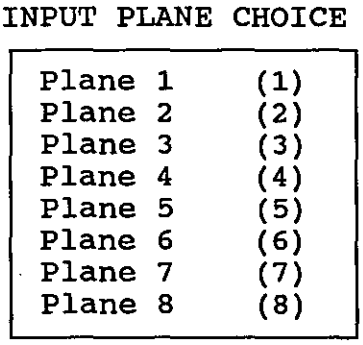
2.4.5 GRAPHICS

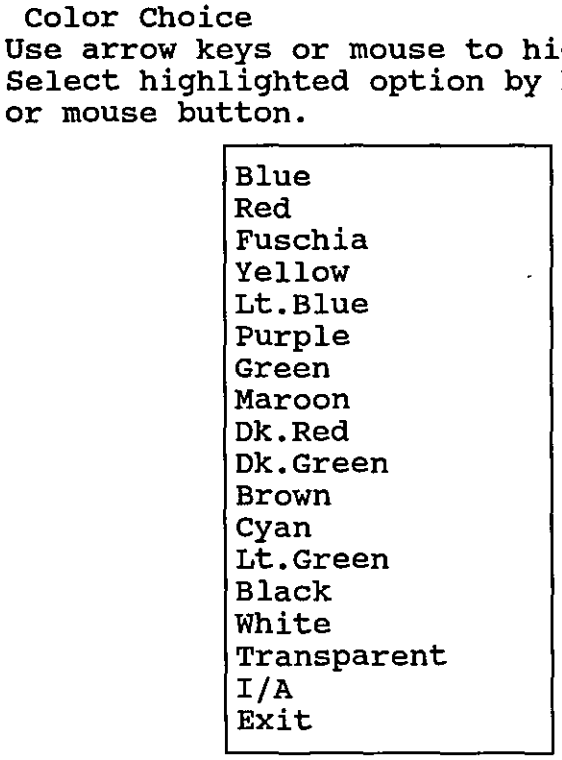
Annotate Cursor Drawing **Graphics** Image Options eXit

Change a Graphics Plane Color	(C)
Delete a Graphics Plane	(D)
Reset Graphics Plane Colors	(R)
<ESCape>	

2.4.5.1 CHANGE GRAPHICS PLANE COLOR

Allows the user to change the color of any graphics plane. The user is prompted to choose the plane number and then choose a color from among a list of available colors.





2.4.5.2 DELETE GRAPHICS PLANE

Allows the user to clear any graphics plane. The user is prompted to choose the plane number to clear. Be careful when using this option. **If coastlines or the lat-lon grids are deleted, the only way to restore them is by reloading the image.**

2.4.5.3 RESET GRAPHICS PLANE COLORS

Allows the user to reload the original graphics plane overlay look-up tables, and restore the original colors.

2.4.5.4 ESCape

Return to ANALYZE menu level 1.

2.4.6 IMAGE OPTIONS

Annotate Cursor Drawing Graphics **Image** Options eXit

Histogram Equalize Image	(H)
Linearize Image	(L)
Info Display Toggle	(I)
<ESCape>	

2.4.6.1 HISTOGRAM EQUALIZE IMAGE

Performs a histogram equalization of color look-up tables (LUTs), in order to increase the contrast in an image. The linear black to white color look-up table is altered to provide maximum image contrast.

> **NOTE:** Equalization of the LUTs is completely reversible, and does not effect the image data. Therefore temperatures derived from the image are still valid.

Histogram equalization can also be accomplished from the IDIDAS Main Menu.

2.4.6.2 LINEARIZE IMAGE

Loads a linear black and white color look-up table. Each image data value has a 1:1 correspondence with the displayed grayscale color. This function can also be done from the IDIDAS Main Menu.

2.4.6.3 SHOW IMAGE HEADER INFO

This option displays information on the currently displayed image. Information such as date, time, resolution, and type of data is displayed in a window on the monitor. Doing Image Info a second time will erase the information on the screen. This function can also be accomplished in the **OTHER OPTIONS** menu activated from IDIDAS Main Menu.

```
IMGMAP Image:  E9115223.MS1
NOAA-11 HRPT SST  ORBIT:  8672
DATE 6/1/91 (Jul. 152) TIME 2312 Z
Res = 1.20 km/pix  MERCATOR
Lat. range:  45.95N to 41.12.N
Lon. range:  71.24W to 64.55W

I offset:  -2341  J offset:   5299
```

2.4.6.4 ESCape

Return to ANALYZE menu level 1.

2.4.7 OPTIONS

Annotate Cursor Drawing Graphics Image **Options** eXit

```
Color Bar              (C)
Distance Calculation   (D)
Menu Display Toggle    (M)
Profile Count/Temps    (P)
Redraw Menu Screen     (R)
<ESCape>
```

2.4.7.1 DISPLAY COLORBAR

Allows insertion of a colorbar into the image. The user will be asked to choose <T> for temperatures or <C> for counts.

```
Temperature Scale   (T)
Counts Scale        (C)
```

The user will then be asked to move a box being displayed in plane 8 to the desired location of the colorbar and press any key or mouse button.

```
Horizontal Color Bar   (H)
Vertical Color Bar     (V)
```

The user will also be asked to input the desired orientation of the colorbar.

Move Box to Desired ColorBar Location and Press a Mouse Button or Any Key (ESC to end)

If the image is not a temperature image and the user requests temperatures, the program will default to counts.

> **NOTE:** The colorbar is inserted into the image and is part of the displayed image, and may not be removed from the displayed image. However, the original image file stored on the hard or floppy disc is unaffected. If the image is reloaded from the disc to the screen, the colorbar will not be in the image.

2.4.7.2 CALCULATE DISTANCE

Allows calculation of the distance in kilometers and nautical miles between any two points on the screen. The user will be prompted to move the cursor to the first point and mark it by hitting either mouse button. Then move the cursor to the second point and hit either mouse button. The points picked will appear as small x's. The distance between the points will be displayed on the menu screen. If the process is continued the old second point becomes the new first point.

2.4.7.3 TOGGLE MENU DISPLAY

Toggles between two types of menu display. The default menu has the Function keys displayed along the top of the display. By activating this toggle, the function key display can be moved from the top to the left side of the menu. The different menus correspond to the different types of PC keyboards.

2.4.7.4 PROFILE COUNTS/TEMPERATURE

Allows a user to draw a line on the screen and display a graph of the temperatures (and counts) along that line. The graph is displayed in plane 8. The old graph will automatically be erased if the option is repeated, or the graph may be erased by the command <G>raphics <D>eletplane <8>.

2.4.7.5 ESCape

Return to ANALYZE main menu.

2.4.8 EXIT ANALYZE MENU

Exits you from ANALYZE main menu and puts you back to the IDIDAS main menu if you entered ANALYZE through this option, or places you at the DOS> prompt, if using the command line option.

2.5 COASTWATCH TURBIDITY TASK

Information on the clarity of coastal waters is essential to many basic estuarine and coastal programs within NOAA. This information has importance in dealing with the amount of light available to seagrasses and to phytoplankton, the presence of suspended sediments and some related pollutants, and the identification of water masses in areas of weak thermal structure. This Turbidity Calculation provides the mechanism to remove sunglint from an image.

2.5.1 TURBIDITY CALCULATION

The equation applied for water turbidity calculation corrects for some aerosols but leaves a bias resulting from the Rayleigh path radiance. The bias for scenes less than 300 km across can be readily removed by the end user by subtracting a value from the intermediate output, so that clear water has a near-zero reflectance. Better results are obtained from scenes within a 43 degree sensor nadir angle. Larger areas may require additional enhancements.

The turbidity calculation requires channels 1, 2 and Solar Zenith Angle data be resident when the calculation is executed. Channels 1 and 2 data must be in a compressed format. Solar Zenith Angle data must be in an uncompressed format. All files must be georectified using the same horizontal and vertical shift and skew offsets (See SHIFTIMG Section 2.3.1 and SHIFTFIX Section 2.3.2. Also review and become familiar with SHIFTANC.DOC and SHIFTANC.EXE).

> The turbidity calculation takes about 5 to 10 minutes on a 386 system and 20 to 30 minutes on a 286-AT system. The User Notifications portion of the Turbidity Calculation provides image line counts informing the user the turbidity calculation is processing.

Section 2.5 describes screens which aid the user in the IDIDAS turbidity calculation. The user has the option of invoking the Turbidity Task from the DOS prompt or through the IDIDAS Main Menu (Section 2.0) by choosing **Turbidity Task**. Both options are explained in the following sections.

The user must provide information for the Turbidity Task to know which files to process. Input file selection must be indicated (Section 2.5.1 or option of CWTURBID). Files are selected by high order name. This means the user selects only the high order filename.ch1 and the system automatically selects the corresponding .ch2 and .sol files. File validation is performed, file compatibility is checked, bias entry is performed and the Turbidity Corrected File is produced. The following paragraphs describe user entries and computer processing required to compute turbidity:

Invoking the Turbidity Task at the DOS prompt requires typing:

CWTURBID filename

where: Filename is the high order name of the files (without extensions) to be used as input for the turbidity calculation.

The Turbidity File Select Menu (Section 2.5.1) is presented if the Turbidity Task is invoked through the IDIDAS Main Menu (Section 2.0). The user must select files, perform turbidity with the selected files, or exit the Turbidity Task. The Available Files for Turbidity (Section 2.5.2) is displayed if the user chooses to change files.

Once files are selected for turbidity calculation (through the DOS prompt or Turbidity File Select Menu), the selected files are checked for validity. If the files are not valid, a User Notification message is presented to notify the user which file is not valid. The user must select valid files, perform turbidity with selected files or exit using the Turbidity File Select Menu (Section 2.5.1).

File compatibility is performed next. If the selected files are not compatible, the File Attribute Display (Section 2.5.3) is presented to notify the user, followed by the Turbidity File Select Menu (Section 2.5.1) which allows

the user to re-select compatible files or exit the Turbidity Task.

User Notifications (Section 2.5.4) are presented to notify the user of processing events. Another User Notification (Section 2.5.4) is presented after the Intermediate Turbidity calculation to allow the user to select an area of clear water for bias offset using the ROAM and ZOOM capabilities.

After a bias offset is chosen, the Turbidity Corrected File and Graphics File are produced. The user may continue to select a different bias offset by responding to the prompt presented and selecting a new location for the clear water offset. User Notifications (Section 2.5.4) are presented informing the user of the Turbidity Corrected File name and the Graphics File name. The Turbidity Corrected File is in an 8-bit format. It must be loaded using the "other options" and "8-bit image load" selections of LOADIMG. The graphics portion of the Turbidity Corrected File must be loaded using the GRFXLOAD program.

The IDIDAS Main Menu or the DOS prompt is presented upon completion of the Turbidity Task.

2.5.2 TURBIDITY FILE SELECT MENU

The Turbidity File Selection allows the user to execute turbidity with displayed files or to change files.

It is presented if the user invokes turbidity through the IDIDAS Main Menu (Section 2.0) or an error condition is detected with file selection.

Turbidity File Select Menu

```
Select Files for Turbidity
Run Turbidity with  (.ch1,2,sol)
Exit
```

Data elements:

- o Filename - Selected high order name for data files (.ch1, .ch2 and .sol are used for turbidity, this is user changeable).

Available Files for Turbidity (Section 2.5.3) is presented if the **Select Files for Turbidity** option is chosen.

File validation and file compatibility checks are performed (as described in Section 2.5) if the user chooses the **Run Turbidity with Filename** option.

Control is returned to IDIDAS Main Menu (Section 2.0) or DOS if **Exit** is chosen.

2.5.3 AVAILABLE FILES FOR TURBIDITY

The Available Files for Turbidity display lists all files in the current directory with a default extension of .ch1.

When a file is selected, the associated .ch2 and .sol files are also chosen to perform Turbidity Calculation.

After a selection is made, the Turbidity File Select Menu (Section 2.5.2) is presented to allow the user to run with the selected file, select another file or exit.

```
 Turbidity Task                    <P> Changes Path
 ESC to exit                       <W> Changes Wildcard
 ? - header display

CURRENT PATH -> C:\MSC
WILDCARDS    -> *.ch1
```

```
GULF2.CH1       E9115223.CH1
GULF1.CH1
```

Data elements:

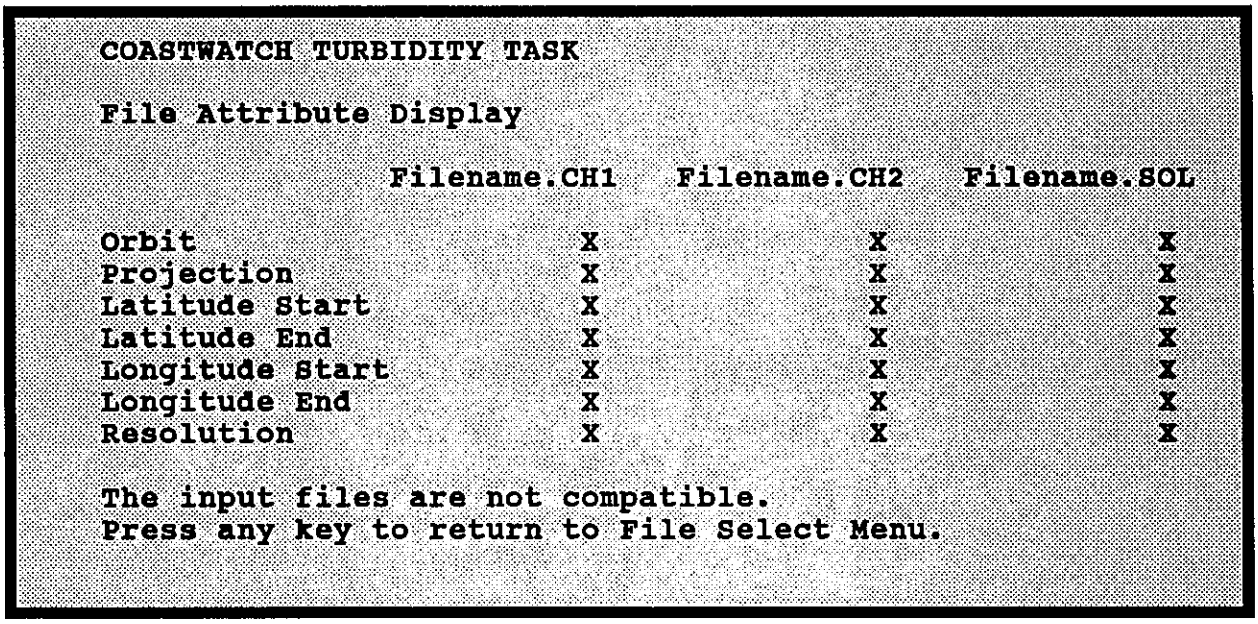
All files in the present directory with .ch1 extension are displayed. Section 2.1.1 gives detailed information of all options available.

After a file is selected, Turbidity File Selection Menu (Section 2.6.2) is presented again to allow further processing with the chosen files.

2.5.4 FILE ATTRIBUTE DISPLAY

The File Attribute Display shows relevant information used

for validity checks for channels 1, 2, and SOL files. All input files must have the same orbit and location related values for turbidity calculation to be valid.



Data elements:

Header structure values for channels 1, 2 and SOL files.

This display allows the user to determine which files are not compatible. The user must obtain valid compatible files to proceed with the turbidity calculation.

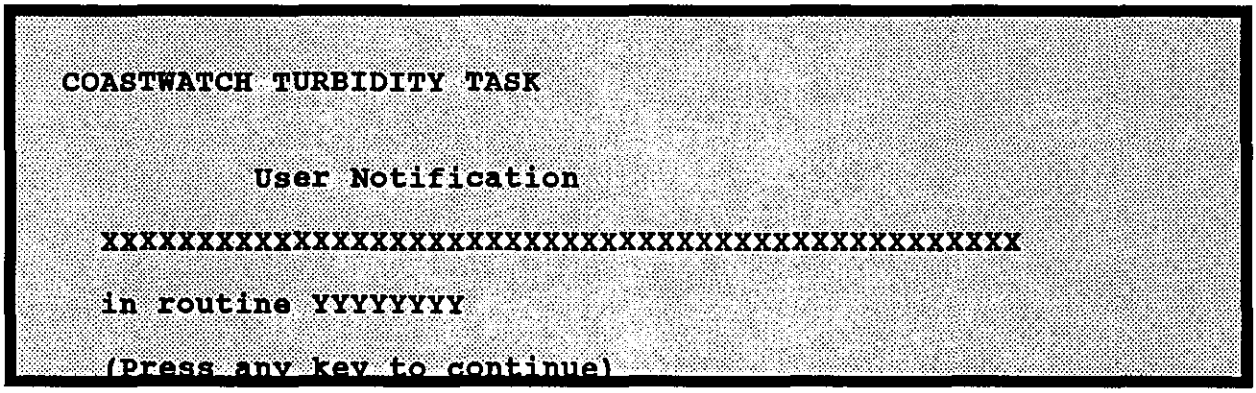
The File Select Menu (Section 2.6.2) is displayed to allow the user to select other files or exit the Turbidity Task.

2.5.5 USER NOTIFICATION

User Notifications displays information and error conditions to the user. The notifications are displayed to inform the user that the task is still executing or intervention is required. Notifications also indicate when exception conditions occur requiring user action.

The format of one-line displays is as follows:

Note: Y's are a Turbidity Task routine name
Z's are a file name on the disk



INFORMATIONAL NOTIFICATIONS

The following are valid one-line informational user notifications for the Turbidity Task:

- **Final Turbidity corrected image is: filename.trb**
- **Final Turbidity Graphics file is: filename.gfx**
- **Turbidity bias line XXXX written to file and monitor**

The recommended actions for the above informational notifications are:

Final Turbidity corrected image is: filename.trb
This message indicates the Turbidity Task has successfully executed and the Turbidity Corrected File is in filename.trb.

Final Turbidity Graphics file is: filename.gfx
This message indicates the Turbidity Task has successfully executed and the Graphics File is in filename.gfx.

Turbidity bias line XXXX written to file and monitor
This message indicates the line was written to the Turbidity Corrected File and monitor. This allows the user to estimate the amount of time remaining for the turbidity calculation. This message is displayed during bias processing.

The following informational User Notifications may be displayed requiring more information than can fit on one line.

```
COASTWATCH TURBIDITY TASK

        User Notification

Place cursor on location for turbidity bias.

Pick a location where there is non-turbid water.
Then hit any key to select the bias at that point.

Use F10 key to ZOOM, F9 key to UNZOOM.
Use the mouse to ROAM to find the location.
```

This message indicates the computation of turbidity is successfully terminated and the user must select a clear area to apply for a bias. It is recommended that the user use the Mouse and ZOOM (F10 and F9 keys) capability to obtain the exact pixel to obtain the best possible results.

```
COASTWATCH TURBIDITY TASK

        User Notification

Turbidity line XXXX of XXXX written to file

THIS CALCULATION TAKES 5-10 MINS. ON A 386

THIS TAKES 20-30 MINS. ON A 286-AT SYSTEM
```

This message indicates the line was written to the intermediate file and the monitor. This allows the user to estimate the amount of time remaining for the turbidity calculation. This message is displayed during the turbidity calculation.

ERROR NOTIFICATIONS

The valid one-line error notifications are as follows:

- **ZZZZZZZZ.ZZZ should be compressed**
- **ZZZZZZZZ.ZZZ should not be compressed**

- **o ZZZZZZZZ.ZZZ is not channel 1**
- **o ZZZZZZZZ.ZZZ is not channel 2**
- **o ZZZZZZZZ.ZZZ is not a solar file**
- **o ZZZZZZZZ.ZZZ is not on the disk**
- **o ZZZZZZZZ must be shifted/skewed the same**

The recommend action for the notifications is:

ZZZZZZZZ.ZZZ should be compressed
This message indicates the files were improperly obtained from the NAS9000 and they should be re-obtained in a compressed mode, or the IDIDAS compress program should be run on these programs. The Turbidity File Select Menu (Section 2.5.1) is presented to allow the user to exit or select other files for processing.

ZZZZZZZZ.ZZZ should not be compressed
This message indicates the file was improperly obtained from the NAS9000 and it should be re-obtained in an uncompressed mode. The Turbidity File Select Menu (Section 2.5.2) is presented to allow the user to exit or select other files for processing.

ZZZZZZZZ.ZZZ is not channel 1
This message indicates the internal header information is incorrect for the specified file. It is recommended that the file be re-obtained from the NAS9000. The Turbidity File Select Menu (Section 2.6.2) is presented to allow the user to exit or select other files for processing.

ZZZZZZZZ.ZZZ is not channel 2
This message indicates the internal header information is incorrect for the specified file. It is recommended that the file be re-obtained from the NAS9000. The Turbidity File Select Menu (Section 2.6.2) is presented to allow the user to exit or select other files for processing.

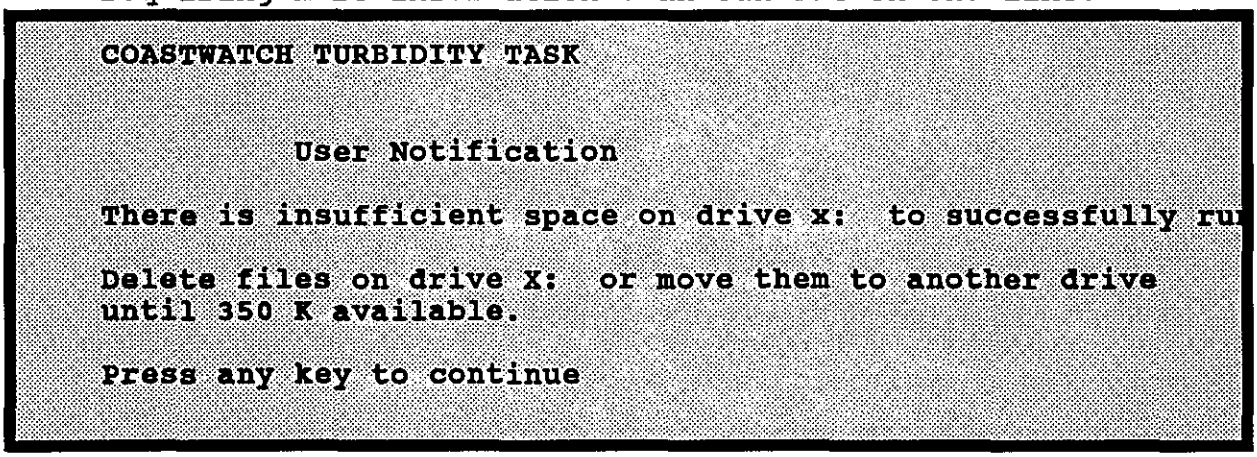
ZZZZZZZZ.ZZZ is not a solar file
This message indicates the internal header information is incorrect for the specified file. It is recommended that the file be re-obtained from the NAS9000. The Turbidity File Select Menu (Section 2.6.2) is presented to allow the user to

exit or select other files for processing.

ZZZZZZZZ.ZZZ is not on the disk
This message indicates the required file is not on the disk or is not in the correct directory. The user must obtain the file from the NAS9000 or copy it to the correct directory. The Turbidity File Select Menu (Section 2.6.2) is presented to allow the user to exit or select other files for processing.

ZZZZZZZZ must be shifted/skewed the same
This message indicates an error was detected because the shift and/or skew was not the same for the channel 1, 2 and SOL files. The user must either shift and/or skew all files the same, or download the files again from the NAS9000.

The following error User Notifications may be displayed requiring more information than can fit on one line.



This message indicates too many files are on the disk and that some must be deleted before processing can continue. The IDIDAS Main Menu or DOS prompt is presented to allow the user delete files.

The following User Notification is displayed notifying the user a different location for the bias offset may be selected.

DO YOU WISH TO RE-DO BIAS OFFSET? n

Other messages may appear indicating a DOS or Microsoft

related error. If any of these messages appear it is recommended that the user allow the system to "cool-down" and try the Turbidity Task again after 30 minutes. If these messages re-appear it is possible that there are problems with the computer.

2.6 GRAPHICS SAVE/LOAD OPTIONS

Selecting the **GRAPHICS SAVE/LOAD OPTIONS** FROM THE IDIDAS Main Menu allows the user the option to save or load compressed graphics files.

2.6.1 GRAPHICS SAVE

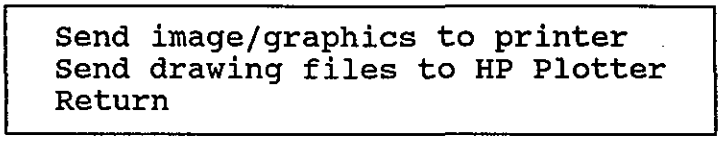
GRFXSAVE allows a user to save an individual graphics plane or all graphics planes in a compressed format. **GRFXSAVE** can be used in interactive or automatic mode. See GRFXSAVE.DOC for more information.

2.6.2 GRAPHICS LOAD

GRFXLOAD allows a user to load a compressed format graphics file saved with GRFXSAVE to the #9 board. See GRFXLOAD.DOC for more information on this routine.

2.7 OUTPUT OPTIONS

These routines allow the user to direct input files to output devices such as laser printers, dot-matrix printers, or plotters. Drawing files saved by the ANALYZE program can be sent to an HP 7475A plotter to plot, or directed to a printer for black and white printing. From the IDIDAS Main Menu, selecting **OUTPUT OPTIONS** provides the user with another menu which you can select from.



Selecting the first option, **Send image/graphics to printer**, prepares the information for output to the user's selected HP Laserjet or dot matrix printer. Selecting the second option, **Send drawing files to HP Plotter**, provides you with options to run **MERMAP** or **MERPLT**.

2.7.1 MERMAP

The MERMAP program allows the user to create files for plotting on an HP 7475A plotter using the MERPLT routine. If you have a drawing file called E91123M.DRW on the D drive, the procedure to use MERMAP is explained as follows:

```
D:\>MERMAP <ENTER>
```

You are given several areas that you would like to be plotted:

```
 AREA TO BE PLOTTED
 1  NE             32N 49N  60W  82W
 2  SE             23N 41N  69W  82W
 3  Gulf E         17N 34N  80W  91W
 4  Gulf W         15N 32N  86W  99W
 5  NW             40N 53N 114W 136W
 6  SW             20W 41N 105W 136W
 7  Great Lakes    41N 50N  74W  93W
 8  Coast Watch    25N 38N  72W  83W
 9  User Input
```

```
Enter Choice
If you want the NE area to be plotted.
 1 <ENTER>                    (EXAMPLE)

 REGION SELECTED IS  NE

                              47.00 N
BOX BOUNDARIES:    82.00 W              57.00 W
                             32.00 N

COASTLINES WILL BE PLOTTED IN WITH PEN #1

Working......
```

You are given the number of points to be plotted for the coast line, for example:

```
 NPTS=    31587
  FILES TO BE PLOTTED:

      COAST LINES ADDED
      -----------------
```

```
You are asked what will be included in the plot:
WHICH DO YOU WANT INCLUDED IN THE PLOT?

 1) PLOT A DRAWING FILE FROM DISK
```

```
 2) ADD ANALYSIS INFO BOX IN UPPER LEFT CORNER
 3) SAVE COMPLETED PLOT FILE AND PLOT
 1 <ENTER>                          (EXAMPLE)

 NAME OF  FILE CONTAINING DRAWING?
 E91123M.DRW <ENTER>                  (EXAMPLE)
```

You can specify the color of the pen to be used:

```
USE WHICH PEN?  (1-6)  DEFAULT WILL BE #2
4 <ENTER>                          (EXAMPLE)
 FILES TO BE PLOTTED:

        COAST LINES ADDED
        E91123M.DRW
        --------------------
```

You are asked again what will be included in the plot.

```
WHICH DO YOU WANT INCLUDED IN THE PLOT?

 1) PLOT A DRAWING FILE FROM DISK
 2) ADD ANALYSIS INFO BOX IN UPPER LEFT CORNER
 3) SAVE COMPLETED PLOT FILE AND PLOT
```

If you don't have any other files to be plotted, but you want to save the file, then

```
3 <ENTER>                          (EXAMPLE)
```

The drawing file created by MERMAP, such as E91123M.DRW, can then be sent to an HP for plotting using the MERPLT command.

2.7.2 MERPLT

MERPLT is a plotting routine that prints the plotter output file created by MERMAP to produce hardcopy output on a Hewlett-Packard 7475A plotter.

2.7.3 PRINTIMG

PRINTIMG is a program that allows a user to send the contents of an image memory to a dot matrix or HP Laserjet printer for printing. After typing PRINTIMG, a number of windows will appear allowing you to select various options. Output is sent either directly to the printer or to a disk file for printing at a later time. (See PRINTIMG.DOC for more information)

2.8 OTHER OPTIONS

Selecting **OTHER OPTIONS** from the IDIDAS Main Menu activates another window where the user is presented with a number of options to chose from.

```
Save 8-bit image
Save TARGA file
Apply NOAA logo
Apply land mask
Apply image filter
Show HEADER.TBL
Load LOOP images
LOOP images
Return
```

2.8.1 SAVE AN 8-BIT IMAGE

SAVEIMG lets a user save the 8-bit values stored in the image or graphics planes of the #9 board RAM to an 8 bits/pixel file. Images can be saved with or without headers. An 8-bit image created with SAVEIMG can then be used in the IDIDAS LOOP routine. See SAVEIMG.DOC for more specifics on this special command.

2.8.2 SAVE TARGA FORMAT FILE

SAVETGA lets the user save the 8-bit values stored in the image and/or graphics of the #9 board RAM to a 512x512 TARGA format file for later output to color printers. Both color and black-and-white files may be saved. See SAVETGA.DOC for more information.

2.8.3 APPLY IMAGE FILTERS

Image filtering can be activated either within the IDIDAS menu system or at the DOS prompt by typing FILTERS.

FILTERS is a routine that gives the user the option of implementing one of nine spatial domain filters. These may be used to enhance or suppress some features or aspects of an image display on the image monitor.

Filters 1 through 7 are the mean, median, and high pass filters. Application of these filters will result in a permanent change in the displayed image, while the disk file image remains unchanged. The image may be restored to its original state only by reloading the image from the disk file. Filters 8 and 9 perform edge detection algorithms with output to the graphics planes, leaving the image

unchanged. See FILTDEMO.DOC for an explanation on the effects of the different filters on an image.

2.8.4 COMPOSIT

Compositing is a process where two or more images can be combined into one image to produce more structure in an image, or to show features that may not be evident in one image. Compositing is activated by typing COMPOSIT at the DOS command prompt. Pop-up menus guide you through the compositing sequence. (Refer to IDIDAS documentation provided with software)

2.8.5 LOOP

Loop is an option that allows a user to loop four 256x256 images that were loaded to the four quadrants of the #9 board using LOADLOOP. The images must be 8-bit images generated by SAVEIMG, and all images should be georectified before saving. (Refer to LOOP.DOC and LOADLOOP.DOC for more information on this useful feature).

2.8.6 NOAALOGO

This program allows a user to insert a NOAA logo into the overlay graphics planes of a image. The user is prompted for location and size of the logo.

2.8.7 LANDMASK

This program eliminates all land areas by creating a landmask. Landmasking pixels are turned on in a plane of the #9 graphics board as the program uses the respective image's HEADER.TBL and a data file called LANDMASK.DAT. If these two files are not found, the program will abort. It is a nice routine to use to eliminate land areas.

2.8.8 SHOW HEADER.TBL

Provides information on a selected image such as image date, time, orbit number,latitude/longitude boundaries, resolution, and geocorrection parameters. Image information can also be obtained by hitting the <?> key when in **LOADIMG** or by executing IMAGE, INFO in the ANALYZE menu.

2.8.9 RETURN

Exits you out of the **OTHER OPTIONS** menu and returns you to the IDIDAS Main Menu.

APPENDIX 1

IDIDAS Programs and Their Functions

- ANALYZE: A main program which allows a user to analyze an image being displayed on the High Resolution Monitor.

  The temperatures, counts, latitudes, and longitudes are displayed on the screen to represent the values at the cursor position, and continuously updated while the cursor is roamed on the monitor screen. This program also has many other options, such as zoom, roam, colorbar, color enhancement, color change, annotation, line drawing and deleting, distance calculation between two points, etc., by calling different subroutines.

- CLEAR: Clears any or all image planes or any or all graphics planes in Number Nine board.

- COLRAMP: Allows interactive alteration of the color look-up table.

- COMPOSIT: Composites two PC images on the hard disk.

- FILTERS: Implements nine spatial domain filters. These may be used to enhance or suppress some features or aspects of an image display on the image monitor. Filters 1 through 7 are the mean, median, and high pass filters. Application of these filters will result in a permanent change in the displayed image, while the disk file image remains unchanged. The image may be restored to its original state only by reloading the image from the disk file. Filters 8 and 9 perform edge detection algorithms with output to graphics output to the graphics planes, leaving the image unchanged.

- GRAYRAMP: Allows interactive alteration of the grayscale color table.

- GRFXSAVE: Allows a user to save an individual graphics plane or all graphics planes in a compressed format.

- GRFXLOAD: Allows a user to load a compressed format graphics file saved by GRFXSAVE to the #9 board.

- GRFX2IMG: Allows a user to embed the contents of one or all graphics planes into an image displayed on the #9 board. The graphics may be embedded with a value from 0 (black) to 255 (white).

- HISTEQ: Alters the color look-up table to maximize the contrast in the image.

- IDIDAS: This is a Shell driver program for the IDIDAS system. This program allows users to call the other major modules in IDIDAS system.

- INIT: Initializes graphics board (supplied by the Number Nine Corporation).

- LANDMASK: Generates a land mask for displayed image.

- LINEAR: Restores a linear enhancement table to the color look-up table, providing a 1:1 correspondence of image data value to displayed grayscale.

- LOADCLUT: Loads image color look-up table to memory.

- LOADIMG: Reads an image file from disk and writes the data to the Number Nine board. Different options and types of loads can be selected depending on the characteristics of the images available.

- LOADLOOP: Loads a reduced resolution 256x256 8-bit image to one quadrant of the image monitor.

- LOADOLUT: Loads overlay color look-up table to memory.

- NOAALOGO: Allows a user to insert a NOAA logo into the overlay graphics planes 1, 2 and 3 of the image displayed on the Number Nine board.

- LOOP: Allows a user to loop four 256x256 images loaded to the four quadrants of the #9 board. The rate of looping may be changed by the user.

- MERMAP: Allows drawing files saved by the ANALYZE program to be sent to a HP plotter. Coastlines and latitude/longitude grids are also added if so desired.

- MERPLT: Sends file created by MERMAP to the HP plotter.

- NSET: Prepares the Number Nine board for use by the IDIDAS software.

- PRINTIMG: Allows a user to send the contents of the image memory to a wide carriage printer.

- SAVEIMG: Allows a user to save the 8-bit values stored in the image or the graphics of the #9 board RAM to an 8-bit/pixel file. Images may be saved with or without a header.

- SHIFTIMG: Shifts or skews the image horizontally or vertically under the graphics planes, allowing a user to align an image with the coastlines and geopolitical boundaries, and to temporarily georectify the display of a misnavigated image.

- SHIFTFIX: Allows a user to permanently georectify a misnavigated image.

- SHOHDR: Allows a user to display image header information for an IDIDAS image file.

REQUIRED FILES AND PROGRAMS

NSET.BAT	#9 board initialization driver
PREP32.EXE	#9 board 32-bit preparation program
INIT.EXE	#9 board initialization program
LOADCLUT.EXE	Initialize #9 board color look-up table
LOADOLUT.EXE	Loads #9 board overlay look-up table
ANCOLCON.TBL	ANALYZE color enhancement table file
FONT6.TBL	ANALYZE font file (6 pixels high)
FONT9.TBL	ANALYZE font file (9 pixels high)
ANALYZE.EXE	Allows interactive analysis of image in #9 board RAM
LOADIMG.EXE	Loads image file to #9 board RAM
PRINTIMG.EXE	Sends image output to designated printer
SAVEIMG.EXE	Saves 8-bit image from #9 board display
CLEAR.EXE	Clears #9 board image and/or graphics
ANOLUT.TBL	Specifies IDIDAS graphics colors
COLRAMP.EXE	Interactive alteration of color look-up table
FILTERS.EXE	Performs spacial domain filters on image
GRFX2IMG.EXE	Embeds graphics into an image
GRFXSAVE.EXE	Saves graphics in a compressed format
GRFXLOAD.EXE	Loads compressed graphics file
HEADER.TBL	Contains information about an image
HISTEQ.EXE	Performs Histogram Equalization of image
LINEAR.EXE	Provides linear gray scale display of image
IDIDAS.CFG	Sets default parameters for IDIDAS
LOOP.EXE	Loops through 4 sequential images
LOADLOOP.EXE	Loads imagery for looping capability
LOGO.EXE	Loads NOAA graphics logo
SHIFTFIX.EXE	Permanently corrects a misnavigated image file
SHIFTIMG.EXE	Temporarily corrects a misnavigated image file
SHOHDR.EXE	Displays image header information for a particular image file

APPENDIX 2

CREATING AND RECEIVING NEW IMAGES

RECEIVING IMAGES FROM OPC

Satellite imagery and other data files are distributed from the Ocean Products Center (OPC) in Washington, D.C. to the regional CoastWatch nodes throughout the United States on a routine basis. Telecommunications between the OPC and the regional nodes are established using dedicated lines or dial-up capability. Both synoptic-view (low resolution) and high resolution image files are being distributed to the nodes. Additional image files (such as visible images) and environmental data will also be distributed to the regional nodes as the information becomes available.

CREATING IMAGES FROM THE NOAA MAINFRAME COMPUTER (AUTHORIZED TSO USERS ONLY)

Satellite image products are produced from the AVHRR level 1B data base, which resides on a NOAA main frame computer. This data base is organized as a fixed-sized queue which is continually updated, allowing selection from among approximately forty individual HRPT and LAC data sets. Each image data set has a residence time of approximately 24 hours. To generate an AVHRR image file from a specific orbit, you must run IMGMAP on the NOAA NAS9000 mainframe. The generated image file will reside in your account for approximately another 24 hours. The image data files can be downloaded from the mainframe to your workstation or file server via IRMA, Ethernet, or another communications system.

A. Running IMGMAP on the NOAA Mainframe

Logon the mainframe and start up the KLMEP library by typing:

#SWITCH IMAGV <ENTER>
READY

Run the IMGMAP program:
THIS IS A MASTER CLIST OF IMGMAP SYSTEM

Type **#PANEL** <ENTER>

You are given a list of utilities of interest. Specify the number:

SELECT A UTILITY OF INTEREST

1 = #BNDCHK - DETERMINES TEMPERATURE AND VALUE OF A PIXEL

```
                GIVEN POSITION OF THE PIXEL
  2 = #BREAKUP - CREATES INDIVIDUAL CHANNEL AND ANCILLARY
  3 = #HEADER  - DISPLAYS HEADER INFORMATION
  4 = #IMGMAP  - EXECUTES THE IMGMAP SYSTEM
  5 = #LUKUP   - CREATES 8 BIT LOOKUP TABLES
  6 = #MASK    - DETERMINES PERCENTAGE CLOUDINESS IN A CLOUD
                 MASK FILE
  7 = #ORBSTAT - DISPLAYS COMPOSITE INFORMATION
  8 = #SETRES  - DETERMINES LAT/LONG BOUNDARIES AND RESOLUTION
  9 = #SPACE   - DETERMINES AMOUNT OF SPACE REQUIRED FOR OUTPUT
                 IMAGE FILES
 10 = #SYSCON  - CREATES SYSTEM CONTROL FILE

 ENTER Q IF YOU WISH TO QUIT
 4 <ENTER>                      (EXAMPLE)

 DO YOU HAVE A CONTROL FILE SET UP FOR THE REQUIRED TARGET AREA?

 ANSWER YES OR NO   OR Q TO QUIT
 NO <ENTER>                     (EXAMPLE)
```

You are asked to turn on or off the job processing options:

```
 ENTER JOB PROCESSING OPTION
 1 = TURN ON OPERATION
 0 = TURN OFF OPERATION
 Q = QUIT
 1 <ENTER>                      (EXAMPLE)
```

You are asked to specify the type of satellites. NOAA-G=NOAA 10, and NOAA-H=NOAA 11:

```
 SELECT TYPE OF SATELLITE
 1 = MORNING SATELLITE  (NOAA-G)
 2 = AFTERNOON SATELLITE  (NOAA-H)
 Q = QUIT
 1 <RETURN>                     (EXAMPLE)
```

You are asked the department that you work:

```
 ENTER PRODUCT ID
 1 = JOINT ICE CENTER
 2 = MASTER MAPS
 3 = OCEAN PRODUCTS
 Q = QUIT
 3 <ENTER>                      (EXAMPLE)
```

You will be asked what kind of data type you want to select.

LHRR = Local High Resolution Radiometer (LAC); GHRR = Global High Resolution Radiometer (GAC); HRPT = High Resolution Picture Transmission; AMSU-A or B = Advanced Microwave Sounding Unit A or B:

```
SELECT DATA TYPE
1 = GHRR
2 = LHRR
3 = HRPT
4 = AMSU-A
5 = AMSU-B
Q = QUIT

3 <ENTER>                    (EXAMPLE)

SELECT TIME OF INTEREST
1 = DAY TIME
2 = NIGHT TIME
3 = DON'T CARE (BOTH DAY AND NIGHT TIME)
Q = QUIT

1 <ENTER>                    (EXAMPLE)

WOULD YOU LIKE TO SELECT DAY TIME CHANNELS OF INTEREST?
ANSWER YES OR NO  OR Q TO QUIT
```

If you want the day time data:

```
YES <ENTER>                  (EXAMPLE)
```

You are asked to select the channel/channels. If you want to select, type 1. If not, type 0:

```
SELECT DAY TIME CHANNELS OF INTEREST

CHANNEL 1 DATA  - > 1 = ON , 0 = OFF
1 <ENTER>                    (EXAMPLE)

CHANNEL 2 DATA  - > 1 = ON , 0 = OFF
1 <ENTER>                    (EXAMPLE)

CHANNEL 3 DATA  - > 1 = ON , 0 = OFF
1 <ENTER>                    (EXAMPLE)

CHANNEL 4 DATA  - > 1 = ON , 0 = OFF
1 <ENTER>                    (EXAMPLE)

CHANNEL 5 DATA  - > 1 = ON , 0 = OFF
1 <ENTER>                    (EXAMPLE)
```

If you change your mind or make a mistake in selecting the channel/channels, you have an opportunity to change:

```
DO YOU WISH TO CHANGE YOUR CHANNEL SELECTION
ANSWER YES OR NO  OR Q TO QUIT
NO <ENTER>                   (EXAMPLE)
```

You are asked to select day time ancillary maps:

```
WOULD YOU LIKE TO SELECT DAY TIME ANCILLARY MAPS?
```

```
  ANSWER YES OR NO  OR Q TO QUIT
  YES <ENTER>                    (EXAMPLE)
```

You will specify what day time ancillary maps you want to select:

```
  SELECT DESIRED DAY TIME ANCILLARY MAPS
  SCAN ANGLE - > 1 = ON , 0 = OFF
  0 <ENTER>                      (EXAMPLE)

  SATELLITE ZENITH ANGLE - > 1 = ON , 0 = OFF
  0 <ENTER>                      (EXAMPLE)

  SOLAR ZENITH ANGLE - > 1 = ON , 0 = OFF
  0 <ENTER>                      (EXAMPLE)

  RELATIVE AZIMUTH ANGLE - > 1 = ON , 0 = OFF
  0 <ENTER>                      (EXAMPLE)

  SCAN TIME - > 1 = ON , 0 = OFF
  0 <ENTER>                      (EXAMPLE)
```

You will be given another opportunity to change your selection:

```
  DO YOU WISH TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                     (EXAMPLE)
```

You can apply different kinds of corrections:

```
  SELECT TYPE OF CORRECTION(S) TO BE APPLIED

  SUN NORMALIZATION - > 1 = ON , 0 = OFF
  1 <ENTER>                      (EXAMPLE)

  LIMB CORRECTION - > 1 = ON , 0 = OFF
  1 <ENTER>                      (EXAMPLE)

  NON LINEARITY CORRECTION - > 1 = ON , 0 = OFF
  1 <ENTER>                      (EXAMPLE)
```

If you change your mind or make a mistake, you will be given an opportunity to change:

```
  DO YOU WISH TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                     (EXAMPLE)
```

You are asked to select the type of calibration:

```
  SELECT TYPE OF CALIBRATION TO BE PERFORMED ON EACH CHANNEL
  0 = RAW COUNTS  1 = RADIANCES  2 = ALBEDOS AND BTS
  3 = ALBEDOS AND BTS USING GOES LOOK UP TABLE

  ENTER TYPE OF CALIBRATION FOR CHANNEL 1
  2 <ENTER>                      (EXAMPLE)
```

```
  ENTER TYPE OF CALIBRATION FOR CHANNEL 2
  2 <ENTER>                          (EXAMPLE)

  ENTER TYPE OF CALIBRATION FOR CHANNEL 3
  2 <ENTER>                          (EXAMPLE)

  ENTER TYPE OF CALIBRATION FOR CHANNEL 4
  2 <ENTER>                          (EXAMPLE)

  ENTER TYPE OF CALIBRATION FOR CHANNEL 5
  2 <ENTER>                          (EXAMPLE)

  DO YOU WISH TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                         (EXAMPLE)
```

Choose the graphic options:

```
  SELECT GRAPHIC OPTIONS

  FILLED UP SPOTS  - > 1 = ON , 0 = OFF
  0 <ENTER>                          (EXAMPLE)

  LAT/LON GRIDS  - > 1 = ON , 0 = OFF
  1 <ENTER>                          (EXAMPLE)

  COAST LINES  - > 1 = ON , 0 = OFF
  1 <ENTER>                          (EXAMPLE)

  LAND/SEA TAGS  - > 1 = ON , 0 = OFF
  0 <ENTER>                          (EXAMPLE)

  DO YOU WISH TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                         (ENTER)
```

Choose the type of projection for the image:

```
  SELECT TYPE OF PROJECTION
  0 = UNMAPPED  1 = MERCATOR
  2 = POLAR     3 = LINEAR LAT/LONG
  Q = QUIT
  1 <ENTER>                          (EXAMPLE)
```

You may specify the latitude and longitude boundaries and have the program determine the resolution, or you can specify the central point and map resolution:

```
SELECT A FLAG FOR RESOLUTION

  0 = PROGRAMS CHOICE - PROGRAM COMPUTES AN OPTIMUM RESOLUTION
                        REQUIRED TO INSCRIBE THE TARGET AREA
                        GIVEN LAT LONG BOUNDARIES
  1 = USER'S CHOICE   - SELECT RESOLUTION AND SPECIFY CENTRAL
                        LATITUDE AND LONGITUDE
```

```
                        GIVEN LAT LONG BOUNDARIES
  Q = QUIT

If you want to select yourself:
  1 <ENTER>                        (EXAMPLE)

Specify the central latitude and longitude of the target area in
decimal format:

  ENTER CENTRAL LATITUDE OF TARGET AREA IN FLOATING POINT MODE
  (SIGN CONVENTION NORTH  +VE , SOUTH  -VE)
  30.0 <ENTER>                    (EXAMPLE)

  ENTER CENTRAL LONGITUDE OF TARGET AREA IN FLOATING POINT MODE
  (SIGN CONVENTION EAST  +VE , WEST  -VE)
  -80.0 <ENTER>                   (EXAMPLE)

Specify resolution in decimal format:
  ENTER RESOLUTION IN FLOATING POINT MODE
  (SHOULD BE IN DEGREES PER PIXEL FOR LINEAR LAT LONG, SAMPLING
  INTERVAL FOR UNMAPPED AND IN KMS FOR ALL OTHER PROJECTIONS)
  1.1 <ENTER>                     (EXAMPLE)

You are given another opportunity to change your selection:
  WOULD YOU LIKE TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                      (EXAMPLE)

Specify your map size you want:
  ENTER SIZE OF IMAGE (COLUMNS X ROWS ,EX : 512 512)
  512 512 <ENTER>                 (EXAMPLE)

  SELECT TYPE OF COMPOSITING TO BE PERFORMED

  0 = NO COMPOSITE            1 = COMP BASED ON MINIMUM NADIR ANGLE

  2 = RETAIN AVERAGE VALUE    3 = RETAIN LATER
  4 = RETAIN WARMER VALUE     5 = RETAIN COLDER VALUE
  Q = QUIT

If you want to choose no composite:
  0 <ENTER>                        (EXAMPLE)

  SELECT TYPE OF FILLUP
  0 = NO FILLUP    1 = AVERAGE VALUE FILLUP
  2 = ADJACENT PIXEL VALUE FILLUP
  Q = QUIT
  1 <ENTER>                        (EXAMPLE)

Specify the satellite zenith angle cutoff angle in the
decimal format:
  ENTER SATELLITE ZENITH ANGLE CUTOFF ANGLE IN FLOATING POINT
```

```
MODE (ENTER 70.0 FOR NO CUTOFF)
70.0 <ENTER>                    (EXAMPLE)
```

You are given a list of record you previously selected. If you want to make any further change, you can specify the number:

```
PLEASE NOTE THE RECORD NUMBERS INDICATED ,IF YOU WISH TO MAKE
ANY FURTHER CHANGES EX - 20) HERE 20 IS THE RECORD NUMBER
PLEASE STANDBY:

 1) 1                          JOB PROCESSING FLAG
 2) 01                         SELECT SATELLITE - MORNING,AFTERNOON
 3) 3                          PRODUCT ID- 1=JIC,2=MASTER
                               MAPS,3=OCEAN PROD
 4) 00100                      DESIRED DATA TYPES- GHRR,LHRR,HRPT,
                               AMSU-A, AM
 5) 10                         DAY/NIGHT FLAG- DAY,NIGHT
 6) 11110000000000000000       SELECTED DAYTIME CHANNELS
 7) 00000000000000000000       SELECTED NIGHTTIME CHANNELS
 8) 0000000000                 SELECTED DAYTIME ANCILLARY
                               INFORMATION
 9) 0000000000                 SELECTED NIGHTTIME ANCILLARY
                               INFORMATION
10) 11100                      CORRECTION FLAG- SUN NOR,LIMB COR,
                               NONLIN,SP
11) 22222000000000000000       DATA CALIBRATION FLAGS
12) 0110                       GRAPHICS BITS- FILLED UP SPOTS,
                               L/L,C/L,L/S T
13) 1                          TYPE OF PROJECTION
14) 30.0 30.0 -80.0 -80.0      LAT/LON BOUNDARIES,GLOBAL 0-360
15) 512 512 1.1                IMAGE SIZE- COLS,ROWS,RESOLUTION
16) 2                          IMAGE PIXEL LENGTH
17) 0                          COMPOSITE FLAG
18) 1                          FILLUP OPTION
19) 2660.35 909.52 909.52 1930 730WAVE NUM OF CHAN 3,4,5 & EQ
                                    CROSSING TIMES
20) 2670.96 927.75 842.14 1340 140WAVE NUM OF CHAN 3,4,5 & EQ
                                    CROSSING TIME
21) 22528                       BLOCKSIZE OF THE MAPPED OUTPUT IMAGE
                                FILES
22) 70.0                        SOLAR ZENITH CUTOFF ANGLE

WOULD YOU LIKE TO CHANGE ANY OF THE PREVIOUS SELECTIONS?
ANSWER YES OR NO   OR Q TO QUIT
```

If nothing will be changed,enter:
  NO <ENTER>   (EXAMPLE)

You are asked whether you want to want to save the control file in a permanent data file:
  WOULD YOU LIKE TO SAVE THE CONTROL FILE IN A PERMANENT DATA FILE? ANSWER YES OR NO OR Q TO QUIT
  NO <ENTER>   (EXAMPLE)

If you desire to save the control file, designate a permanent data file such as:
  NSS.PSATAARB.KLMEP.DATA(filename)

This file will permanently reside on the mainframe and be available for callup if you decide to remap satellite data with the given parameters.

You are next asked whether you have a permanent output file set up. If not, you are asked whether you want to create an permanent output file:
  DO YOU HAVE A PERMANENT OUTPUT IMAGE FILE SET UP FOR THIS SYSTEM? (FOR HELP ON AMOUNT OF SPACE REQUIRED EXECUTE #SPACE CLIST) ANSWER YES OR NO OR Q TO QUIT
  NO <ENTER>   (EXAMPLE)

  DO YOU HAVE A GRAPHICS FILE WHICH YOU WOULD LIKE TO REUSE?
  ANSWER YES OR NO OR Q TO QUIT
  NO <ENTER>   (EXAMPLE)

  WOULD YOU LIKE TO CREATE A GRAPHICS FILE A THIS TIME?
  ANSWER YES OR NO OR Q TO QUIT
  YES <ENTER>

Specify the longitude and longitude grids intervals:
  ENTER LATLONG GRID INTERVAL (EX - 4,5,8   ETC)
  5 <ENTER>   (EXAMPLE)

Specify your continents of interest for coastlines:
  SELECT CONTINENTS OF INTEREST FOR COAST LINES
  (NOTE - LESSER THE # OF AREAS, FASTER THE TURN AROUND TIME)

If we are only interested in North America:
  NORTH AMERICA - > 1 = ON , 0 = OFF
  1 <ENTER>   (EXAMPLE)

  SOUTH AMERICA - > 1 = ON , 0 = OFF
  0 <ENTER>   (EXAMPLE)

  AFRICA   - > 1 = ON , 0 = OFF
  0 <ENTER>   (EXAMPLE)

  EUROPE   - > 1 = ON , 0 = OFF

```
  0 <ENTER>                          (EXAMPLE)

  ASIA            - >  1 = ON , 0 = OFF
  0 <ENTER>                          (EXAMPLE)
```

You have another opportunity to change your selection of the continents of interest:

```
  WOULD YOU LIKE TO CHANGE YOUR SELECTION?
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                         (EXAMPLE)
```

If you want to compute the SSTs, you can specify now. For meteorological applications, no SST is needed, and the running time will be saved:

```
  WOULD YOU BE INTERESTED IN PRODUCING SSTS?
  ANSWER YES OR NO  OR Q TO QUIT
  YES <ENTER>                        (EXAMPLE)

  ENTER A FLAG FOR ORBIT SELECTION
  0 = PROGRAM CHOICE  - THE PROGRAM FINDS AN ORBIT THAT COVERS
                        MOST OF THE TARGET AREA.
  1 = USER'S CHOICE   - ALLOWS THE USER TO SELECT AN ORBIT OF
                        INTEREST
  2 = STATIC 1B ORBIT - ORBIT IS KNOWN TO THE USER AND IS
                        AVAILABLE IN A PERMANENT/TEMPORARY FILE
  Q = TO QUIT
  1 <ENTER>                          (EXAMPLE)

  WOULD YOU LIKE TO CHANGE YOUR SELECTION
  ANSWER YES OR NO  OR Q TO QUIT
  NO <ENTER>                         (EXAMPLE)
```

A list of orbit datasets will appear, and the format is the same as in the SSTMAP. Since we have selected the afternoon orbits, only NOAA 11 orbits will appear, for example:

```
  1 NSS.HRPT.NH.D91079.S0156.E0205.B1278989.GC
  2 NSS.HRPT.NH.D91079.S0722.E0735.B1279292.WI
  3 NSS.HRPT.NH.D91079.S0904.E0915.B1279393.WI
  4 NSS.HRPT.NH.D91079.S1041.E1050.B1279494.GC
  5 NSS.HRPT.NH.D91079.S1403.E1415.B1279696.GC
  6 NSS.HRPT.NH.D91079.S1709.E1719.B1279898.WI
  7 NSS.HRPT.NH.D91079.S1847.E1900.B1279999.WI
  8 NSS.HRPT.NH.D91079.S2040.E2051.B1280000.GC

  SELECT A NUMBER THAT CORRESPONDS TO AN ORBIT OF INTEREST
  7 <ENTER>                          (EXAMPLE)

  NSS.HRPT.NH.D91079.S1847.E1900.B1279999.WI
  # OF SCANS:  4651
```

```
SATELLITE ID      1
    14.72  -54.48   13.01  -67.64   10.66  -80.34
    17.29  -54.93   15.59  -68.27   13.17  -81.08
    19.66  -55.34   18.02  -68.86   15.50  -81.80
    22.05  -55.71   20.44  -69.46   17.84  -82.57
    24.45  -56.06   22.88  -70.08   20.17  -83.38
    26.84  -56.42   25.29  -70.71   22.48  -84.22
    29.24  -56.74   27.72  -71.36   24.80  -85.12
    31.62  -57.05   30.13  -72.03   27.09  -86.05
    34.02  -57.33   32.55  -72.73   29.36  -87.05
    36.41  -57.58   34.96  -73.46   31.64  -88.13
    38.80  -57.81   37.38  -74.23   33.90  -89.27
    41.20  -58.01   39.77  -75.02   36.13  -90.49
    43.57  -58.20   42.16  -75.86   38.34  -91.77
    45.96  -58.34   44.56  -76.75   40.55  -93.18
    48.34  -58.46   46.94  -77.71   42.71  -94.66
    50.72  -58.52   49.32  -78.74   44.85  -96.30
    53.10  -58.53   51.70  -79.85   46.97  -98.09
    55.47  -58.52   54.05  -81.06   49.04  -99.99
    57.85  -58.40   56.41  -82.41   51.07 -102.12

-----END OF PLOT

DO YOU LIKE TO CHANGE YOUR SELECTION?
ENTER YES OR NO  OR Q TO QUIT
NO <ENTER>                    (EXAMPLE)

WOULD YOU LIKE TO PROCESS THE ORBIT SELECTED?
ANSWER YES OR NO  OR Q TO QUIT
YES <ENTER>                   (EXAMPLE)

ENTER R FOR RESELECTING AN OPTION FROM THE MAIN MENU OR Q TO
QUIT
Q <ENTER>                     (EXAMPLE)

READY


STATUS <ENTER>
```

Typing STATUS shows you what jobs are executing, providing you with a job name and job number. The time for executing an IMGMAP job may take from 30 minutes to several hours depending on the computer status. You may log off the computer now and logon at a later time to see if your job is completed. When IMGMAP has completed, a status message will state 'SMPGACZ1(JOBnumber) on output queue'.

You can then type

OUTPUT SMPGACZ1(jobnumber) <ENTER>

to see if the job ran properly. If the job has run successfully, you can then compress the image file using IMAPCOMP under the VICOMX library, and download the file using IRMA, ETHERNET, or some other communications routine.

B. Running SSTMAP on the NOAA Mainframe

You can either use a terminal or IDIDAS workstation to run SSTMAP. Using the IDIDAS workstation as a terminal, logon to TSO and run #SSTMAP or #AVHRR on the NOAA NAS-9000 computer to generate AVHRR image data files. The procedures are:

Turn on IDIDAS workstation, and go to C drive:
C: <ENTER>
C: cd\ <ENTER>

Initialize the IRMA card:
TSO <ENTER>

Go to D drive:
D: <ENTER>

Go to TSO.:
<SHIFT>&<SHIFT>

Use RM2 as logon to TSO. Then supply your ID and password.

Execute the startup for the VICOMX library:
READY
EX 'NSS.IPATAVST.VICOMX.CLIST(#S)' 'T' <ENTER>
READY

If you want to see a list of data sets (usually 18 orbits) available at this time before running #AVHRR, you may type:

SHOW LHRR <ENTER> (EXAMPLE)

The screen will show the list of data sets following this command. Then

TO GET A LIST OF NADIR POINT FOR ANY ORBIT TYPE:
PLOT N (N = NUMBER OF DESIRED ORBIT)
READY

PLOT 14 (EXAMPLE)

The list of data sets will repeat again to the last orbit before orbit 12. Then

```
CALL NADIR FOR NSS.LHRR.NH.D91045.S1506.E1514.B1231717.GC
DATASET TYPE=LAC    ORBIT NUMBER= 1231717   NUM OF SCANS= 2739
```

Following is a list of LAT, LONG, and nadir angles.

The following description of the format in which the orbit datasets are listed will help in determining which pass to choose.

```
Field#  1    2    3   4   5      6     7      8     9

       14   NSS.LHRR.NH.D91045.S1506.E1514.B1231717.GC
               HRPT NG                                WI
               GHRR
```

1 Data set number: NOAA-10 = 1.....9;
NOAA-11 = 10....18

2 Data set owner: NSS = National Satellite Service

3 Type of data: LHRR = Local High Resolution Radiometer (LAC);
GHRR = Global High Resolution Radiometer (GAC);

HRPT = High Resolution Picture Transmission.

4 Satellite: NG = NOAA-10;
NH = NOAA-11.

5 Date of data acquisition: 91 = 1991; 045 = Julian Date.

6 Start time of data acquisition (in Universal time).

7 End time of the data acquisition (in Universal time).

8 Orbit number: The first 5 digits are the rev number on which the data set started. The remaining 2 digits are the last 2 digits of the rev number on which the data set ended. For all HRPT areas the last 2 digits will be repeats of the previous 2 digits. For most LAC areas this will also be above the equator (on the next orbit), the last 2 digits will be incremented by one

(i.e. 003233). All GAC data sets will follow this pattern.

9 CDA Station: GC = Gilmore Creek;
WI = Wallops Island.

Once you have chosen a data set, you are asked whether you want a

print out of the nadir line location of the data set. This option may be used to ensure that the data set is over the area of which you want to generate an image, and that it actually has

data in it.

```
DO YOU NEED A PLOT OF EARTH LOCATIONS?
ENTER YES/NO

NO <ENTER>                    (EXAMPLE)
```

If the data set initially chosen is not suitable, you may type YES. Then it will return to the original step, and let you choose
again.

Run the AVHRR mapping program:

```
READY
#AVHRR <ENTER>
```

Specify the type of AVHRR data with which to work.
Choose HRPT, LHRR, or GHRR. (LHRR = LAC, GHRR = GAC)

```
ENTER A DATA SET TYPE TO BE PROCESSED
EXAMPLE - HRPT/LHRR/GHRR

LHRR <ENTER>                  (EXAMPLE)
```

You have the options to let program find an appropriate data set or you may define your own data set:

```
ENTER A FLAG FOR ORBIT SELECTION
0=PROGRAM CHOICE - THE PROGRAM FINDS AN ORBIT THAT COVERS
                   MOST OF THE TARGET AREA.
1=USER'S CHOICE  - ALLOWS THE USER TO SELECT AN ORBIT OF
                   INTEREST

1 <ENTER>                     (EXAMPLE)
```

You will be present with a list of available orbit data sets (usually 18 orbits) again. These data set sets are on a rotating queue, with nine data set slots available for each satellite (NOAA-10, and NOAA-11). Each data set is resident on the queue for about eighteen hours. The screen then shows:

```
SELECT A NUMBER THAT CORRESPONDS TO AN ORBIT OF INTEREST

14 <ENTER>                    (EXAMPLE)
```

Once you have chosen a data set, you are asked whether you want a print out of the nadir line location of data set.

```
DO YOU NEED A PLOT OF EARTH LOCATION?
ENTER YES/NO

NO <ENTER>                    (EXAMPLE)
```

If the data set initially chosen is not suitable, you may loop back up and find another data set by replying YES. If the data

set is acceptable, then reply:

```
WOULD YOU LIKE TO CHANGE YOUR SELECTION?

NO <ENTER>                    (EXAMPLE)
```

Specify the type of map projection to be used. For areas beyond 60N or 60S, use POLAR. For areas between 60N and 60S, use MERCATOR projection:

```
ENTER A FLAG FOR MAPPING
1 = MERCATOR
2 = POLAR
3 = LINEAR LAT-LONG

1 <ENTER>                     (EXAMPLE)
```

You are asked to specify the area to be mapped. You may specify the latitude and longitude boundaries and have the program determine the resolution, or you may specify a center point and the map resolution. For the latter option, the program will calculate the latitude and longitude boundaries and provide you with this information. If the area to be covered as calculated is unacceptable, the program will allow you to redo your choice of center point and resolution. The following formula and information may be helpful in determining the resolution necessary to cover the image area.

```
Map Size(km)         = 512 pixels X Resolution (km/pixel)
and
Map Size(deg long.) = 512 pixels X Res(km/pixel)/112
                       (km/deg long.)
   (1 degree of longitude = 112 km.)

   SELECT A FLAG FOR RESOLUTION
   0 = PROGRAM CHOICE - THE PROGRAM COMPUTES AN OPTIMUM
                        RESOLUTION REQUIRED TO INSCRIBE THE
                        TARGET AREA WITHIN A SELECTION IMAGE SIZE

   1 = USER'S CHOICE  - SELECT YOUR OWN RESOLUTION AND SPECIFY A

                        CENTRAL LOCATION OF THE TARGET AREA.
```

If you want PROGRAM CHOICE:

```
   0 <ENTER>                  (EXAMPLE)
```

Specify latitude of center point (in decimal format.)

```
   ENTER BEGINNING AND ENDING LATITUDES OF TARGET AREA IN
   FLOATING POINT MODE
   (SIGN CONVENTION:  NORTH POSITION AND SOUTH NEGATIVE)
```

```
   30.0 35.0 <ENTER>          (EXAMPLE)

Specify longitude of center point (in decimal format.)
(Note the convention used for East and West.)

   ENTER BEGINNING AND ENDING LONGITUDES OF TARGET AREA IN
   FLOATING POINT MODE
   (SIGN CONVENTION:  NORTH POSITION AND SOUTH NEGATIVE)

   40.0 45.0 <ENTER>          (EXAMPLE)

If you want USER'S CHOICE:

   1 <ENTER>                  (EXAMPLE)

   ENTER CENTRAL LATITUDE OF TARGET AREA IN FLOATING POINT MODE
   (SIGN CONVENTION:  NORTH POSITION AND SOUTH NEGATIVE)

   34.0 <ENTER>

   ENTER CENTRAL LONGITUDE OF TARGET AREA IN FLOATING POINT MODE

   (SIGN CONVENTION:  EAST POSITION AND WEST NEGATIVE)

   45.0 <ENTER>               (EXAMPLE)

Specify resolution (in decimal format).

   1.1 <ENTER>                (EXAMPLE)

Accept or reject the boundaries:

   BOUNDARY OF BOX AROUND IMAGE
   LATITUDES  ->  31.8915558  36.0812378
   LONGITUDES ->  42.4576416  47.5125732

   ARE YOU HAPPY WITH BOUNDARY OF THE IMAGE?
   ENTER YES/NO

   YES <ENTER>                (EXAMPLE)

Choose the equation of calculating the sea surface temperature
(SST).  For meteorological applications, no SST is needed, and
will result in the job running slightly faster.
```

```
SELECT AN EQUATION TO BE USED TO COMPUTE SST
0 = NO SST
1 = DAY SPLIT EQUATION     ( NOAA-9 )
2 = NIGHT SPLIT EQUATION   ( NOAA-9 )
3 = NIGHT TRIPLE EQUATION  ( NOAA-9 )
4 = DAY EQUATION           ( NOAA-10 )
5 = NIGHT EQUATION         ( NOAA-10 )
6 = DAY SPLIT EQUATION     ( NOAA-11 )
7 = NIGHT SPLIT EQUATION   ( NOAA-11 )
8 = NIGHT DUAL EQUATION    ( NOAA-11 )
9 = NIGHT TRIPLE EQUATION  ( NOAA-11 )
4 <ENTER>                   (EXAMPLE)
```

The program will take about 2 minutes to allocate data set space and then give you a job number. Write this number down.

```
SAVED
JOB SSTMNDOT(JOB01190) SUBMITTED

----- END OF #SSTMAP
READY
LOGOFF <ENTER>
```

Running the mapping program will take the NAS9000 computer from 30 minutes to 2 hours, depending on how busy it is. After an hour or so, logon the computer again. If the mapping program has run successfully, you will get a message after your logon. A successful run will give a completion code of zero. If no message is received, the job is probably still running. To check the job's status, type:

```
READY
STATUS <ENTER>
```

If the job is still running, logoff and try again later.
The successful job will stay in the computer for about 12 hours.

Within these time limit, you should use IRMA software to download the image to the file server, and create a file name.

If the job has run successfully, you will see after logging on, for example:

```
JOB SSTMNDOT, 1190 ENDED, COMP CODE = ZERO      CN(00)
READY

EX 'NSS.IPATAVST.VICOMX.CLIST(#S)' 'T' <ENTER>
READY
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Run IRMAFS to download the image. You are asked the file type to be converted , and file name to be used:

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IRMAFS <ENTER>
MAKE DATASETS FOR TRANSFER TO FILE SERVER

INPUT THE FILE TYPE TO BE CONVERTED
1 -> TSO DATASET UNDER YOUR USERID
2 -> TSO DATASETS UNDER OTHER USERID'S
3 -> IPB PERMANENT DATASETS

INPUT CHOICE
1 <ENTER>                    (EXAMPLE)

INPUT DATASET PREFIX

      EXAMPLE:  RG        WILL CREATE FILE  'USR.RG.CH1'
                P91038A   WILL CREATE FILE  'USR.P91038A'

P91054M <ENTER>              (EXAMPLE)
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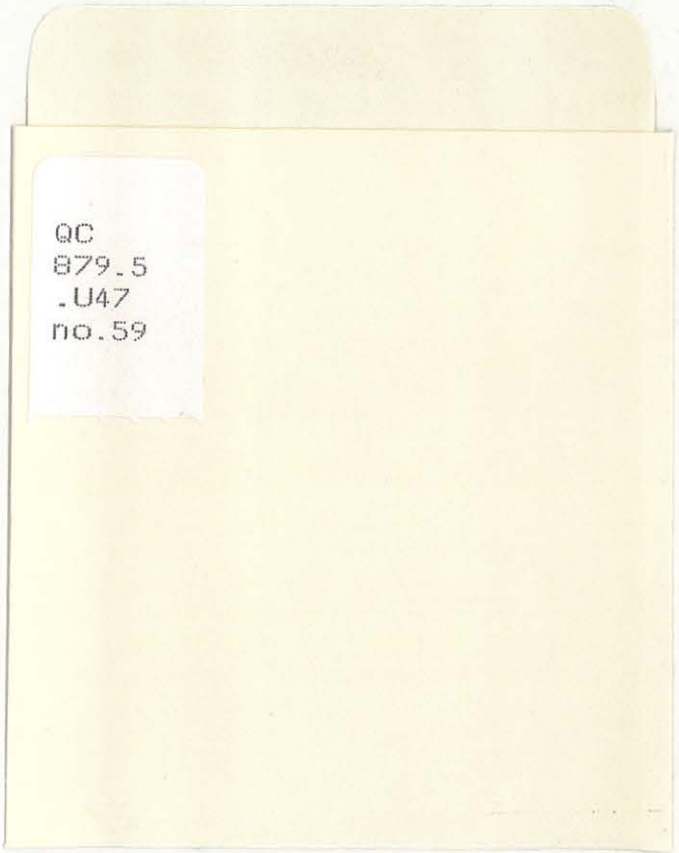
All six channels will be created under your input dataset prefix.

The created dataset files will stay on the mainframe for additional 24 hours.



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(continued from inside cover)

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