

TORRENT Software User Manual for *arrayDesc fclPlnDesc dewarDesc dheDesc sysConfig*

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Authored by: Nick C. Buchholz

Please send comments: <u>nbuchholz@noao.edu</u>

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1.0 Introduction

This document is the user manual for the Torrent programs *arrayDesc*, *fclPlnDesc*, *dewarDesc*, *dheDesc* and *sysConfig*. Section 1 describes the target audience and the functions preformed by each of the programs. Section 2 through Section 5 is the user manual for each of the **Desc**riptor programs. Section 6 is the user manual for the *sysConfig* program.

1.1. Who Needs to Use *sysConfig* and the Desc Programs

The descriptor programs and **sysConfig** are interactive programs written for *detector engineers* and scientists responsible for the integration of a TORRENT detector subsystem into an instrument. The programs are written to automate or simplify tasks currently done by hand and to ensure a consistent level of documentation for the detector controller integration task.

1.2 Why ****Desc

The four descriptor programs were created to support the configuration of a Torrent detector controller system. They are GUI-based programs designed to allow the user to specify the configuration of the various parts of the detector controller in a consistent way and to document the decisions made during the process.

1.2.1 arrayDesc

arrayDesc is a program that allows the user to describe a detector to be used in a focal plane. It allows the description of the pins on the detector, their designation, signal names and types and the minimum, maximum and nominal, voltage values that should be applied to the pin.

The output of **arrayDesc** is a file that can be read by **fc1P1nDesc** to allow the detector to be used in a focal plane. Detector files are identified by the detector type (sta1042, e2v44-82, site1K, orionII, etc.) and by an ID (normally either generic or the detector serial number). A generic description file can be read into the program and written as a unique detector by changing the ID field. Detector file names have the form DtctrName_ID=DtctrID.dsc.

Example: e2v44-82_ID=generic.dsc or e2v44-82_ID=44627.dsc.

1.2.2 fclPlnDesc

fclPlnDesc is a program that allows the user to describe a focal plane containing one or more detectors and a number of other functions (heaters, temperature sensors, etc.) associated with the focal plane. It allows the user to specify the detector to be used and the expected values for the auxilliary functions.

The output of *fclPlnDesc* is a file that can be read by *sysConfig* to allow the engineer to use the description to configure the connections between the focal plane detector signals and focal plane functions to the Dewar connectors and thus to the DHE function connections. Focal plane files are identified by the focalPlane name, such as basicCCD, sta2wTrnt, and so forth. A focal plane description file will be stored in MONSOONHOME/cfg/detectors and will have a name like sta2wTrnt_FclPln.dsc or basicCCD_FclPln.dsc.

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1.2.3 dewarDesc dewarDesc

1.2.4 dheDesc dheDesc

1.2 Why sysConfig

sysConfig is written to help insure that a Torrent detector controller system is properly set up and documented; that the system software **collector**, **mborg**, **borg** will be able to read and understand the eeprom data that resides in the TSM module EEPROM and describes how to start-up and initialize a TORRENT system. The **collector** program automatically creates the configuration file (*****_Config.csv) at system runtime using information provided by **assimilate** and **sysConfig** to determine the layout of the EEPROMs.

The *sysConfig* program suite will allow an engineer to complete and document the following tasks and produce a consistent output format describing the results of the tasks:

- a. assign DHE hardware functions to Dewar pins and detector signals.
- b. describe the connections from array pin to Dewar connector pin to DHE TSM preAmp and/or Utility Pin.
- c. print a wire list to be used for making the correct connections described in (a.).
- d. set up and assign voltage levels to adjustable voltage supplies.
- e. assign user-friendly names to the detector signals and DHE functions connected to them.
- f. set maximum and minimum values to hardware function values to restrict voltages, etc. to safe values.
- g. assign warning and alarm error bands to functions to ensure safe operation of the detector.
- h. assign an initialization value to functions that is automatically set on system startup.
- i. assign a preliminary nominal value to functions that are used during detector optimization.
- j. produce a system document and file to describe all decisions made during the process.
- k. assign a page, line & column position for each function assigned for use in a detector telemetry and control console GUI. ??

1.4 sysConfig Inputs and Outputs

sysConfig uses the output created by **assimilate** and the files created by the descriptor files to determine the capabilities of the detector, Dewar and Torrent DHE hardware. The program will use the DHE TSM connector description, the Dewar connector description to allow the connection of DHE input and output signals to the Dewar connectors to the detector.

After the engineer uses *sysConfig* to complete the tasks above for the required signals and hardware functions, the program will be able to create the following outputs:

- a. an EEPROM image in a file containing the results of tasks (d) through (g) in Section 0.
- b. a .cfg file to be used by **eepStor** and **collector** to describe the TSM eeprom layout.
- c. a wire list describing the connections to be made between the TSM preAmp boards and the Dewar connectors.

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- d. a wire list describing the connections to be made between the Utility board and the Dewar connectors.
- e. a wire list describing the connections to be made between the Dewar connectors and the detector/focal plane pins.
- f. a text file describing the correspondence between user name, DHE function name and detector signal name.
- g. a file/documents describing the initial and default nominal values to be set for each DHE function used by the configuration.

1.5 Standard Arguments to the Programs

Starting the programs in Linux is done by going to an xterm window and typing the appropriate command along with the command line arguments for the command. All of the commands share two arguments:

- -help typing this command line argument with any of the programs will result in a display of all the arguments and the default values for that command.
- -stdout this argument takes a parameter either True or False. If True the program will startup and print debug and error/warning messages to the xterm. If False it will only output warnings and errors to a Python display.

2.0 arrayDesc User Manual

The **arrayDesc** program is started in Linux by typing a command line in an xterm window. The **arrayDesc** command line takes the following optional arguments with defaults in parentheses: Note that the argument and its value are separated by an ascii space.

| -help | print help and exit |
|-------------------------------|--|
| -stdout | print messages rather than display in label (True) |
| -type <arraytype></arraytype> | The name of the Array being described (generic) |
| -arrayID <arrayid></arrayid> | The name of the Array being described (generic) |

To start a description of a new array type (e.g. e2v88-44) you would type:

arrayDesc -type e2v88-44 -arrayID generic

The result of this command should be a splash window like this:

| 🗵 Describing the generic Array (using F | | | |
|---|------------------------------------|-----------------------|--|
| Welcome to ArrayDesc | The Torrent Array Description Tool | Futile resistence is! | |
| | | | |

arrayDesc Splash Screen Figure 1

followed by the main **arrayDesc** GUI window shown in Figure 2.

| Describing the generic Array (using Pmw 1.3) | × |
|---|---|
| Error: array couldn't read file >/MNSN/soft_dev/cfg/_detectors/e2v88-44_ID=generic_ Array.dsc< No Name?? | |
| | |
| Default Directory /MNSN/soft_dev/cfg/_detectors | |
| Array Description file name e2v88-44_ID=generic_Array.dsc | |
| Read Description File Write Description file | |
| | |
| Array Type e2v88-44 Array ID generic | |
| # of Pins 0 # of Cols 0 # of Cols 0 | |
| Pin Descriptions | |
| Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm | |
| | |
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| | |
| | |
| Edit Pin Values Copy Pin Paste Pin | |
| Save & Exit (No save) | |
| Now Amor CLU Samon | |

New Array GUI Screen Figure 2

Note the file read error message in the status display and the fact that the pin description area is blank indicating that no .dsc file with this array name was found. To edit an existing array description, the command (for the generic e2v44-82 detector) would be:

> arrayDesc -type e2v88-44 -arrayID generic

resulting in the following display with the details of pin descriptions filled in with previous work.

| 🗵 Desci | Describing the generic Array (using Pmw 1.3) | | | | | | | | |
|--|---|-------------|-----------|-----------|-----------|----------|----------|-------|---|
| | Starting logging: Wednesday 20100707.1422:18 – | | | | | | | | |
| Status | Status: | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Default Directory //MNSN/soft_dev/cfg/_detectors | | | | | | | | | |
| Array (| Array Description file name e2v44-82_ID=generic_Array.dsc | | | | | | | | |
| | Read Description File Write Description file | | | | | | | | |
| | | Arra | y Type | e2v44-82 | Array | J ID | generic | | _ |
| | | # of Pins | 40 | | | | | | |
| | | # of Cols | 4096 | # of Rows | 204 | B Out | oput Cfg | AB | |
| Γ | | | | Pin Des | criptions | | | | |
| [| Desg | Signal Name | Sgnl Type | Minimum | Maximum | Nominal | Warning | Alarm | |
| | A1 | SUB | AGND | 0.0 | 9,0 | 0.0 | 0,08 | 0,16 | |
| | A8 | SUB | AGND | 0.0 | 9.0 | 0.0 | 0,08 | 0,16 | |
| | C1 | SUB | AGND | 0.0 | 9.0 | 0.0 | 0,08 | 0,16 | |
| | C8 | SUB | AGND | 0,0 | 9,0 | 0.0 | 0,08 | 0,16 | |
| | F2 | SUB | AGND | 0,0 | 9.0 | 0.0 | 0,08 | 0,16 | |
| | F7 | SUB | AGND | 0.0 | 9,0 | 0.0 | 0,08 | 0,16 | |
| | D8 | P1 | DCLK | 0.0 | 10.0 | LORL | 0.08 | 0,16 | |
| | E8 | P2 | DCLK | 0.0 | 10.0 | HIRL | 0.08 | 0,16 | |
| | F8 | P3 | DCLK | 0.0 | 10.0 | LORL | 0.08 | 0,16 | |
| | D4 | S1_L | DCLK | 1.0 | 11.0 | HIRL | 0.08 | 0,16 | |
| | E4 | S2_L | DCLK | 1.0 | 11.0 | HIRL | 0.08 | 0,16 | |
| | D5 | S1_R | DCLK | 1.0 | 11.0 | HIRL | 0.08 | 0,16 | |
| | E5 | S2_R | DCLK | 1.0 | 11.0 | HIRL | 0,08 | 0,16 | |
| | F6 | S3 | DCLK | 1.0 | 11.0 | LORL | 0,08 | 0,16 | |
| | E2 | SW_L | DCLK | 1.0 | 11.0 | LORL | 0,08 | 0,16 | |
| | E7 | SW_R | DCLK | 1.0 | 11.0 | LORL | 0,08 | 0,16 | |
| | E3 | RG_L | DCLK | 0,0 | 12,0 | HIRL | 0,08 | 0,16 | |
| | E6 | RG_R | DCLK | 0.0 | 12.0 | HIRL | 0.08 | 0,16 | |
| | | Edit Pi | n Yalues | Copy Pin | P | aste Pin | | | |
| | Save & Exit (No save) | | | | | | | | |

arrayDesc Main GUI Window

Figure 3

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From this point you can edit a description or create a new description. A new description begins by filling in the detector description fields just below the "**Array Type**", "**Array ID**" fields.

- "# of Pins" Fill this in by selecting the number of pins from the slider control. This will result in this number of lines appearing in the "Pin Descriptions" scroll list. The lines will be filled with default values of None, 0.0, 0.08 or 0.16.
- "# of Cols" Fill this in with the number of pixels in the active image area of each row.
- "# of Rows" Fill this in with the number of rows in the active image area of the detector.
- "Output Cfg" Fill this in with the output configuration of the detector. The correct values are letters or strings of letters telling how many outputs the detector has and how they are being read out.
 - 'A' indicates a single output CCD. The assumption is made that this is detector reads from lower left to upper right.
 - 'AB', 'CD', 'AD', 'BC', 'AC', 'BD' indicates a two output CCD, with outputs in two of the four corners of the detector. The assumption is that the corners are labeled A, B, C, D starting in the lower left corner and labeling counter clockwise. Thus 'AB' are outputs lower left and lower right corners, and 'AD' are outputs lower left and upper left corners. The rows of the detector are numbered from bottom to top and the columns from left to right.
 - 'ABCD' indicates a four output CCD, reading from each corner toward the center. The first pixel received is assumed to be the lower left corner.
 - 'ABCDEFGH' indicates and eight output CCD (like an OTA) with the outputs evenly spaced along the bottom of the CCD.

IR arrays use this information in a slighly different way and decode the information according to the code used to descramble the pixels coming from the detector.

The next step in the process is to fill in the pin descriptions. From the detector manufacturer's specification sheet fill in the pin Designation ("**Desg**" column), the "**Signal Name**" column, "**Sgnl Type**" column for each pin. When completing the information for the "**Sgnl Type**" column, right click in the field to bring up the selection list for signal types. See Appendix II for the meanings of the types. After selecting a signal type a dialog box will pop up allowing the user to assign nominal, min, max, warning and alarm levels to the signal.

When finished with the description (or at any time you wish to take a break) press the "**Write Description File**" button or the "**Save & Exit**" button to save your work for later use.

3.0 fclPlnDesc User Manual

The *fclPlnDesc* program is started in Linux by typing a command line in an xterm window. The *fclplnDesc* command line takes the following optional arguments with defaults in parentheses: Note the argument and its value are separated by an ascii space.

| -help | print help and exit |
|-----------------------------------|---|
| -stdout | print messages rather than display in label (True) |
| -fclpln <fclplnname></fclplnname> | The name of the focal plane being described (default) |
| -arrays <arraytype></arraytype> | The type of detector in the focal plane ("") |
| -mosRows <mosrows></mosrows> | The number of rows of detectors in the focal plane (1) |
| -mosCols <moscols></moscols> | The number of columns of detectors in the focal plane (1) |

To start a description of a new focal plane (e.g. sta1x4) using sta1042 detectors you would type:

fclPlnDesc -fclpln stalx4 -arrays stal042 -mosRows 4 -mosCols 1 -orfclPlnDesc

This would begin the description of a 1x4 mosaic of sta1042 detectors. The result of this command should be a welcome splash window like this:

| Welcome to BORG Tools | | | | | | |
|--------------------------|--|----------------------------|--|--|--|--|
| Welcome to fcIPlaneDesc | The Torrent focal plane Description Tool | You are being Assimilated! | | | | |
| fclPlnDesc Splash Screen | | | | | | |

Figure 4

followed by the main *fclPlnDesc* GUI window for the first command as shownin Figure 5 or a similar window with no values filled in for the Focalplane Name, Array Type or other fields.

| Describing the sta1x4 Focal plane (using Pmw 1.3) | | | | | | |
|---|---|--|--|--|--|--|
| Starting logging: Thursday 20100708.1151:33 – Error: xx couldn't read file >sta1x4_FclPIn.dsc< No Name?? | | | | | | |
| | | | | | | |
| Default FP Directory /MNSN/soft_dev/cfg/_detectors | | | | | | |
| Focal Plane Description file sta1x4_FclPln.dsc | | | | | | |
| Read Description File Write Description file | | | | | | |
| FclPlane Name sta1x4 Array Type sta1042 of mosaic Co: 1 of mosaic Rol 4 # of Arrys Arry1 Arry2 Arry3 Arry4 | 4 | | | | | |
| Dewar Functions | | | | | | |
| Cnctr Type unk # of Pins 0 | | | | | | |
| Pin Descriptions | | | | | | |
| Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm | F | | | | | |
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| | | | | | | |
| | | | | | | |
| Copy Pin Paste Pin Copy Array Paste Array | | | | | | |
| Save & Exit (No save) | | | | | | |

fclPlnDesc Main Screen for a New Focal Plane Figure 5

If what you wish to do is edit an existing focal plane description, the command line would look like this:

```
fclPlnDesc -fclpln mosaicTest
```

which would result in a main GUI screen with the information you have already filled in displayed as shown in Figure 6.

| ıs: | rting logging: | | | | | | | |
|-----------|-----------------|--------------|-----------|--------------|-----------|------------|-----------|--------|
| | | | | | | | | |
| 1t FP D | irectory /MNS | N/soft_dev. | /cfg/_det | tectors | | | | |
| Plane (|)escription fi | le e2vEng_i | ID=ccd1_4 | Array.dsc | | | | |
| | · | cription I | | -0 | nito Doco | ription f | ila | 1 |
| | Keau Des | scription i | TIE | | Tie Desc | TIPTION T | i ie | |
| clPlane M | Name mosaicTest | Array Type 🗍 | e2vEng (| of mosaic Co | 2 of mos | saic Row 2 | # of Arry | s 4 |
| | Anny | j1 ccd1 Ar | rry2 cod1 | Arry3 c | odi Arry4 | ccd1 | | |
| Dewar | Arry1 | Arry2 A | rry3 A | rry4 | | | | |
| unction | s mingr | | | | | | | |
| | | Cnctr Type | Misc | # of Pins | 20 | | | |
| | Γ | | Pin De | scriptions | | | | |
| Desg | Signal Name | Sgnl Type | Minimum | Maximum | Nominal | Warning | Alarm | F |
| | TS1_i+ | TEMP | 0.0 | 0.0 | 0.0 | 0.1 | 0,2 | |
| 2 | TS1_v+ | TEMP | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | - 17 |
| 3 | TS1_i- | TEMP | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | - |
| 4 | TS1_v- | TEMP | 0.0 | 0.0 | 0.0 | 0,1 | 0,2 | |
| 5 | None | NONE | 0.0 | 0,0 | 0.0 | 0.08 | 0,16 | |
| 6 | TS2_i+ | TEMP | 0.0 | 0,0 | 0.0 | 0,1 | 0,2 | |
| 7 | TS2_v+ | TEMP | 0.0 | 0.0 | 0.0 | 0,1 | 0.2 | |
| 8 | TS2_i- | TEMP | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | |
| 9 | TS2_v- | TEMP | 0,0 | 0,0 | 0.0 | 0.1 | 0,2 | |
| 10 | NC3 | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0,16 | |
| 11 | vHtr1+ | DVLT | 0.0 | 0.0 | 0.0 | 0.1 | 0,2 | |
| 12 | vHtr1Rtn | DVLT | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | |
| 13 | vHtr2+ | DVLT | 0.0 | 0.0 | 0.0 | 0.1 | 0,2 | |
| 14 | vHtr2Rtn | DVLT | 0.0 | 0.0 | 0.0 | 0.1 | 0,2 | |
| 15 | NC4 | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0.16 | |
| 16 | TS3+ | TEMP | 0.0 | 0.0 | 0.0 | 0.1 | 0,2 | \Box |
| | | | | | | | | |
| | | | | | | | | |
| | Сору Р | in Pa | aste Pin | Сору | Array | Paste Arra | y I | |

fclPlnDesc Main Screen for Editing MosaicTest Focal Plane Figure 6

From this point you can edit or create the new description. Fill-in the fields as needed by clicking in the field and typing in the response and hitting the <Return> or <Enter> key.

"FclPlane Name" Type in the name of the focal plane you are creating or a new name to create a focal plane based on the current focal plane.

| "Array Type" | type previous | y type name for a new focal plane. This must be an array y created and stored using arrayDesc . If editing, the y not be changed. |
|------------------------------|-----------------------|--|
| "Mosaic Cols", "Mosaic Rows" | | The number of columns or rows of detectors in the mosaic. If the focal plane is irregular or not rectangular, set one of rows or cols to 1 and the other to the number of detectors in the entire focal plane. Should not be changed when editing. |
| "# of Arrays" | Not usually us fields | sed directly filled in from the values in the previous two |

When the number of arrays has been determined, a number of entry fields will be created for the detector IDs of each detector in the focal plane. The fields are labeled "**Arry1**", … "**Arry#**". As each name is typed and <Enter> or <Return> pressed a new page will be created in the notebook area labeled "**Arry1**", … "**Arry#**".

The first page in this area is always reserved for a virtual connector page called "**Dewar Functions**". This page exists to contain the descriptions of Dewar functions like temperature sensors, focal plane heaters, etc. that are in the cryostat but not directly associated with a detector signal. This connector can be filled in by hand by filling in the various fields or it can be copied from another focal plane using the procedure in section 0.

To fill in the Dewar Functions by hand complete the fields as follows:

"Cnctr Type" Since this does not represent an actual physical connector use Misc or Unk.

"# of Pins" Type in the number of functions required for the current Dewar. If you discover you need more pins at a later date you can increase the number. When you type the number of pins in the pin, display lines will be created in the scrolled entry area on the notebook page.

The next step in the process is to fill in the pin descriptions. Fill in the information for each pin.

- "**Desg**" A designation (1, 2, A4, etc.) for the pin (used for sorting in later steps) the designation must be unique for each pin.
- "Signal Name" Select a unique, short descriptive name for the signal. Append a number to signals with identical names, such as Nc1, Temp1+, etc.
- "Sgnl Type" Select a signal type for each pin. Right click in the field to bring up the selection list for signal types. See Appendix II for the meanings of the types. After selecting a signal type, a dialog box will pop up allowing the user to assign nominal, min, max, warning and alarm levels to the signal.

When finished with the description (or at any time you wish to take a break) press the "**Write Description File**" button or the "**Save & Exit**" button to save your work for later use.

3.1 Copying a Dewar Functions Description

If you wish to copy the Dewar Functions information from another description before filling in any of the DewarFunctions information, press the "**Save & Exit**" button to save the current state.

If using emacs or xemacs, start the editor, split the window and open the .dsc file you just saved in one half and the dsc file you wish to copy from in the other half.

If using vi or vim, open the two files in separate editors.

In the new dsc file look for and delete the three lines below and anything after them:

In the dsc file you are copying from you will find lines similar to the ones above. In the mosaicTest_FclPln.dsc file the lines are:

Select everything from the ####### line to the end of the file and copy it to the new dsc file at the last line and save the new dsc file. The next time you start **fclPlnDesc** to edit your new focal plane, the Dewar Functions page will be filled in.

4.0 dewarDesc User Manual

The *dewarDesc* program is started in Linux by typing a command line in an xterm window. The *dewarDesc* command line takes the following optional arguments with defaults in parentheses. Note the argument and its value are separated by an ascii space.

| -help | print help and exit |
|--------------------------------|--|
| -stdout | print messages rather than display in label (True) |
| -numCnct | the number of connectors on the Dewar wall (1) |
| -dewar <dewarname></dewarname> | The name of the Dewar being described (default) |

To start a description of a new Dewar such as RCSpecDwr, you would type:

```
dewarDesc -dewar RCSpecDwr
```

This would begin the description of a Dewar called RCSpecDwr. If this name already existed *dewarDesc* would one the description for editing. The result of this command should be a welcome window as shown in 0.

| 🕱 Describing the RCSpecDwr Dewar (using Pmw 1.3) | |
|--|--|
|--|--|

Welcome to DewarDesc

The Torrent Dewar Description Tool

Resistence is Futile!

dewarDesc Splash Welcome Window Figure 7

followed for a new Dewar by the main *dewarDesc* GUI window as shown in 0.

| Describing the R | CSpecDwr Dewar | (using Pmw 1.3) | | | | |
|--|---|--------------------|----------------|-----------------|----|--|
| Status: Error: dewar couldn't read file >/MNSN/soft_dev/cfg/_dewars/RCSpecDwr_Dewar.dsc< | | | | | | |
| | | | | | | |
| Default Directory /MNSN/soft_dev/cfg/_dewars | | | | | | |
| Dewar Descriptio | Dewar Description file name RCSpecDwr_Dewar.dsc | | | | | |
| | ead Dewar Descr | | ć. | Description fi | le | |
| | De | war Name RCSpecDwr | # of Cnctrs 1 | _ | | |
| | | Cnctr1 | | | | |
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| | | | | | | |
| | Copy Pin | Paste Pin | Copy Connector | Paste Connector | | |
| | Save & Exit | | | Exit (No save) | | |

dewarDesc Main Screen for New Dewar

Figure 8

or for an existing Dewar a main window with information filled in as in 0.

| 🗵 Describ | Describing the RCSpecDwr Dewar (using Pmw 1.3) | | | | | | | | | |
|-----------|--|----------------|-------------|-----------|---------|------------|-------------|--------|------------|---|
| Status: | Status: Error: dewar couldn't read file >/MNSN/soft_dev/cfg/_dewars/RCSpecDwr_Dewar.dsc< | | | | | | | | | |
| | | | | | | | | | ł | |
| Default | Direc | tory /MNSN/se | oft dev/cfo | ı∕ dewars | | | | | | _ |
| | | tion file name | | | | | | | | _ |
| Dewar De | scrip | | , | | 0 | | | 1 | | |
| | | Read Dewar | Descriptio | n File | Write | e Dewar Do | escriptio | n file | | |
| | Dewar Name RCSpecDwr # of Cnctrs 4 | | | | | | | | | |
| | Cnetr1 JP1 Cnetr2 JP2 Cnetr3 JP3 Cnetr4 JP4 | | | | | | | | | |
| JP1 | Í | JP2 JP3 | JP4 | | | | | | | |
| | | | | | | | | | | |
| | Cnotr Type MilCirc # of Pins 32 | | | | | | | | | |
| | Pin Descriptions | | | | | | | | | |
| D | esg | Signal Name | Sgnl Type | Minimum | Maximum | Nominal | Warning | Alarm | F | |
| N | ONE | None | NONE | 0,0 | 0,0 | 0,0 | 0,08 | 0,16 | $[\Delta]$ | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0,0 | 0,0 | 0,0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0,0 | 0,0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0,0 | 0,0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0.08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0.08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0.08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0.08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0,0 | 0,0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0,0 | 0.0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0.08 | 0,16 | | |
| N | ONE | None | NONE | 0.0 | 0.0 | 0.0 | 0,08 | 0,16 | | |
| | ONE | None | NONE | 0.0 | 0,0 | 0.0 | 0,08 | 0,16 | | |
| J | | | | | | | | | 10.0 | |
| | | | (| | 1 | (| | | | |
| | | Сору Рі | in Pa | ste Pin | Сору Со | nnector Pa | aste Connec | tor | | |
| | | Save & Ex | it | [| | E | cit (No sav | ve) | | |
| | | | | | | | | | | |

dewarDesc Main Screen for Editing an Existing Dewar Figure 9

Doc. File TRNT-AD-08-0006 R0.doc Doc. Number TRNT-AD-08-0006

From this point you can edit or create the new description. Fill in the fields as needed by clicking in the field and typing in the response and hitting the <Return> or <Enter> key.

| "Dewar Name" | Type in the name of the Dewar you are creating or a new name to create a Dewar based on the current one. |
|---------------|--|
| "# of Cnctrs" | Enter the number of connectors in the Dewar wall. The program will create entry fields for the name/designation of each connector. These names must be unique within a description and should match the designation on the Dewar. |

By filling in the name/designation of each connector you will create a notebook page for that connector. Once the page is created you can begin describing the connector by filling in the appropriate fields.

| "Cnctr Type" | The type of the connector. This is a string name for the type such as |
|--------------|--|
| | Dtype, MilCirc, Misc or unk. |
| "# of Pins" | fill in the number of pins for the connector. When you type the number of pins |
| | in the pin, display lines will be created in the scrolled entry area on the |
| | notebook page. Note the program knows about "MilCirc" connectors and will |
| | automatically fill in the pin designations when the number of pins is filled in. |
| | Other types of detectors are not known and the Pin Designations will have to be |
| | completed by hand |

The next step in the process is to fill in the pin descriptions. Fill in the "**Desg**" field for each pin. The pin designation is a unique designation (1, 2, A4, etc.) for the pin (used for sorting in later steps). The rest of the fields are unnecessary for Dewar descriptions and can be ignored.

When finished with the description (or at any time you wish to take a break) press the "**Write Description File**" button or the "**Save & Exit**" button to save your work for later use.

If two connectors are identical except for their connector name, the second may be copied from the first connector. For example 'JP3' and 'JP4' are identical connectors in the RCSpecDwr. Once 'JP3' is filled in, select its page tab to display it then press the "**Copy Connector**" button. Now select the page tab for 'JP4'. The page will be blank. Press the "**Paste Connector**" button to paste the JP3 description here also.

5.0 dheDesc User Manual

The *dheDesc* program is started in Linux by typing a command line in an xterm window. The *dheDesc* command line takes the following optional arguments with defaults in parentheses: Note the argument and its value are seperated by an ascii space.

| -help | print help and exit |
|---------------------------|---|
| -stdout | print messages rather than display in label (True) |
| -type <dhetype></dhetype> | The type (TRNT or ORNG (NYI)) of Dhe being described (NONE) |
| -dhe <dhename></dhename> | The name of the Dhe being described ("") |

To start a description of a new DHE you would type:

```
dheDesc -type TRNT -dhe generic2AFE
```

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This would begin the description of a DHE called generic2AFE. Note that at this time only Torrent DHEs can be described using this tool. In addition, since all Torrent systems will have two AFE boards, this DHE has already been described and is supplied with your distribution. The file is "/Monsoon/cfg/_common/generic2AFE_trntDHE.dsc". To distinguish different DHEs, use the tool to open the generic2AFE file and the rename the DHE to something like "gen2AFE_ID=542". Writing this to the disk will result in a file "/Monsoon/cfg/_common/gen2AFE_ID=542_trnt.dsc".

The result of this command should be a welcome window like this:

| Describing the generic2AFE Dhe (using |) Pmw 1.3) | |
|---------------------------------------|----------------------------------|------------------------|
| Welcome to DheDesc | The Torrent Dhe Description Tool | Resistence IS useless! |

dheDesc Splash Welcome Screen Figure 10

followed by the main *dheDesc* GUI edit window as shown in Figure 11.

| Cnetr Type Miso # of Pins 20 Pin Descriptions Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBiasO0 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBiasO1 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO2 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBiasO5 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO6 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO7 BI | | rectory /MNSN/ | soft_dev/cfd | | | | | | |
|---|--|---|--------------|---------|----------|-----------|----------|---------|-------------------|
| Read DHE Description FileWrite DHE Description fileSystem Name Cnotr1 AFE1Diased Cnotr5Seneric2AFE AFE2DiksVoltages Cnotr3 AFE1VideoBoards Cnotr4 Cnotr6AFE1Diased Cnotr5Cnotr2 AFE2DiksAFE1Ciks Cnotr6Cnotr3 AFE2DiasesAFE1Video Cnotr7Cnotr4 JUUIIFE1BiasesAFE1Ciks AFE1DiaseAFE1Video AFE2DiasesAFE2Ciks AFE2DiasesAFE2Diases AFE2DiasesFE1BiasesAFE1CiksAFE1Video AFE2DiasesAFE2CiksAFE2Diases AFE2DiasesAFE2DiasesDesgSignal Name Sgnl TypeMinimum MaximumMominal MarningAlarmHVR0HVBiasRtn0AGND0.00.00.080.16HVB0HVBiasO0BIAS-5.030.00.00.080.16HVB1HVBiasO1BIAS-5.030.00.00.080.16HVB2HVBiasO2BIAS-5.030.00.00.080.16HVB3HVBiasO3BIAS-5.030.00.00.080.16HVB4HVBiasO5BIAS-5.030.00.00.080.16HVB6HVBiasO7BIAS-5.030.00.00.080.16HVB6HVBiasO7BIAS-5.030.00.00.080.16HVB1HVBiasO1BIAS-5.030.00.00.080.16HVB6HVBiasO5BIAS-5.030.00.00.080.16HVB6HVBi |)escrip | | | | | | | | |
| System Name generic2AFE Voltages Boards Cnotr1 AFE1Biases Cnotr2 AFE1C1ks Cnotr3 AFE1Video Cnotr4 AFE2Biases Cnotr5 AFE1C1ks Cnotr6 AFE2Video Cnotr7 Utility Cnotr8 JUUI1 FE1Biases AFE1C1ks AFE1Video AFE2Biases AFE2C1ks AFE2Video Utility JI FE1Biases AFE1Video AFE2Diase AFE2C1ks AFE2Video Utility JI FE1Biases Signal Name Signal Name Signal | escription file name generic2AFE_trntDHE.dsc | | | | | | | | |
| Cnctr1 AFE1Biased Cnctr5 Cnctr2 AFE1Clks Cnctr3 AFE1Video Cnctr7 Cnctr4 AFE2Biases AFE2Biases AFE2Diases AFE2Video Cnctr4 AFE2Biases AFE2Video Utility Cnctr4 AFE2Biases AFE2Video Utility Cnctr4 AFE2Diases AFE2Clks AFE2Video Utility JI Filbiases AFE1Clks AFE1Video AFE2Diases AFE2Clks AFE2Video Utility JI Cnctr Type Misc # of Pins 20 Pin Descriptions Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.08 0.16 HVB0 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias03 BIAS -5.0 30.0 0.0 <th></th> <th>Read DHE</th> <th>Description</th> <th>File</th> <th>Writ</th> <th>te DHE De</th> <th>scriptio</th> <th>n file</th> <th></th> | | Read DHE | Description | File | Writ | te DHE De | scriptio | n file | |
| Cnctr1 AFE1Biases Cnctr2 AFE1Clks Cnctr3 AFE1Video Cnctr4 AFE2Biases FE1Biases AFE1Clks AFE1Video AFE2Video Cnctr7 Utility Cnctr8 JUtil FE1Biases AFE1Clks AFE1Video AFE2Biases AFE2Clks AFE2Video Utility JU FE1Biases AFE1Clks AFE1Video AFE2Biases AFE2Clks AFE2Video Utility JU Cnctr Type Hiso # of Pins 20 Pin Descriptions Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.00 0.08 0.16 HVB0 HVBiasO1 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBiasO2 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 | | System Name generic2AFE Voltages Boards | | | | | | | |
| Cnotr5 AFE2CIks Cnotr6 AFE2Video Cnotr7 Utility Cnotr8 JiUtil FE1Biases AFE1CIks AFE1Video AFE2Biases AFE2CIks AFE2Video Utility JI Frin Signal Name Signal Yein 20 Pin Descriptions Desg Signal Name Signl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBias00 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 < | | | | | | | | | |
| Cnetr Type Miso # of Pins 20 Pin Descriptions Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBiasO0 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBiasO1 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO2 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBiasO5 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO6 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO7 BI | | | | | _ | Utility | - | | |
| Cnetr Type Miso # of Pins 20 Pin Descriptions Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBiasO0 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBiasO1 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO2 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBiasO5 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO6 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBiasO7 BI | AFE1Bi | ases AFE1C1ks | s AFE1Video | AFE2Bia | ses AFE2 | C1ks AFE | 2Video | Utility | J1Uti |
| Pin Descriptions Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB1 HVBiasO0 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO1 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBiasO2 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBiasO3 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBiasO5 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBiasO5 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBiasO7 BIAS -5.0 30.0 0.0 0.08 0.16 | | | | | - | | ' | • | |
| Desg Signal Name Sgnl Type Minimum Maximum Nominal Warning Alarm HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 HVB0 HVBiasRtn0 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 < | | | Chotr Type | | | 20 | | | |
| HVR0 HVBiasRtn0 AGND 0.0 0.0 0.0 0.0 0.08 0.16 HVB0 HVBias00 BIAS -5.0 30.0 0.0 0.08 0.16 HVB1 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 LVR0 | | | <u> </u> | Pin Des | | | | | _ |
| HVB0HVBias00BIAS-5.030.00.00.080.16HVB1HVBias01BIAS-5.030.00.00.080.16HVB2HVBias02BIAS-5.030.00.00.080.16HVB3HVBias03BIAS-5.030.00.00.080.16HVB4HVBias04BIAS-5.030.00.00.080.16HVB5HVBias05BIAS-5.030.00.00.080.16HVB6HVBias06BIAS-5.030.00.00.080.16HVB7HVBias07BIAS-5.030.00.00.080.16HR10HVBiasRtn1AGND0.00.00.00.080.16LVR0LVBiasRtn0AGND0.00.00.080.16LVB0LVBias01BIAS-18.018.00.00.080.16LVB1LVBias02BIAS-18.018.00.00.080.16 | Desg | : Signal Name | Sgnl Type | Minimum | Maximum | Nominal | Warning | Alarm | F |
| HVB1 HVBias01 BIAS -5.0 30.0 0.0 0.08 0.16 HVB2 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS </td <td>HVRO</td> <td>HVBiasRtn0</td> <td>AGND</td> <td>0,0</td> <td>0,0</td> <td>0,0</td> <td>0.08</td> <td>0,16</td> <td>$\Box \Delta$</td> | HVRO | HVBiasRtn0 | AGND | 0,0 | 0,0 | 0,0 | 0.08 | 0,16 | $\Box \Delta $ |
| HVB2 HVBias02 BIAS -5.0 30.0 0.0 0.08 0.16 HVB3 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias02 BIAS -18.0 | HVBC |) HVBias00 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HVB3 HVBias03 BIAS -5.0 30.0 0.0 0.08 0.16 HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 LVR0 LVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB: | HVBias01 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HVB4 HVBias04 BIAS -5.0 30.0 0.0 0.08 0.16 HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVR0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB2 | 2 HVBias02 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HVB5 HVBias05 BIAS -5.0 30.0 0.0 0.08 0.16 HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB1 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB3 | 3 HVBias03 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HVB6 HVBias06 BIAS -5.0 30.0 0.0 0.08 0.16 HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB4 | HVBias04 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HVB7 HVBias07 BIAS -5.0 30.0 0.0 0.08 0.16 HR10 HVBiasRtn1 AGND 0.0 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 LVB0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB | 5 HVBias05 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| HR10 HVBiasRtn1 AGND 0.0 0.0 0.0 0.08 0.16 LVR0 LVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 LVB0 LVBiasRtn0 AGND 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB6 | 6 HVBias06 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| LVR0 LVBiasRtn0 AGND 0.0 0.0 0.0 0.08 0.16 LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HVB7 | HVBias07 | BIAS | -5.0 | 30.0 | 0,0 | 0,08 | 0,16 | |
| LVB0 LVBias00 BIAS -18.0 18.0 0.0 0.08 0.16 LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | HR10 | HVBiasRtn1 | AGND | 0.0 | 0.0 | 0,0 | 0,08 | 0,16 | |
| LVB1 LVBias01 BIAS -18.0 18.0 0.0 0.08 0.16 LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | LVR | | AGND | 0.0 | 0.0 | 0,0 | 0,08 | 0,16 | |
| LVB2 LVBias02 BIAS -18.0 18.0 0.0 0.08 0.16 | LVB | LVBias00 | BIAS | -18.0 | 18.0 | 0,0 | 0,08 | 0,16 | |
| | LVB: | LVBias01 | BIAS | -18.0 | 18.0 | 0,0 | 0,08 | 0,16 | |
| UVBZ UVB: ==07 PTOC ==10.0 10.0 0.0 0.00 0.16 | LVB2 | 2 LVBias02 | BIAS | -18.0 | 18.0 | 0,0 | 0,08 | 0,16 | |
| | LVB3 | LVBias03 | BIAS | -18.0 | 18.0 | 0,0 | 0,08 | 0,16 | |
| LVB4 LVBias04 BIAS -18.0 18.0 0.0 0.08 0.16 | LVB4 | | BIAS | -18.0 | 18.0 | 0.0 | 0,08 | 0,16 | |
| | | | | | | | | | - p.e. |

dheDesc Main Edit Screen Figure 11

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When editing a Torrent DHE description only two controls are really needed. The "Boards" button brings up a dialog box that allows the user to specify the serial numbers of the boards in the DHE being edited. The "Voltages" button allows the user to select the voltage levels to be used by this DHE. This information is used by the *sysConfig* program to document the desired voltage settings for the DHE.

The 'Blue' control buttons are only useful if describing a DHE from the beginning.

6.0 sysConfig User Manual

The *sysConfig* program is started in Linux by typing a command line in an xterm window. The *sysConfig* command line takes the following optional arguments with defaults in parentheses: Note the argument and its value are separated by an ascii space.

| -help | print help and exit |
|------------------------------|--|
| -stdout | print messages rather than display in label (True) |
| -sysName <sysname></sysname> | The system configuration name (default) |
| -fclPlane <fpname></fpname> | The Focal Plane Name (fromFile) |
| -dewar <dwrname></dwrname> | The dewar name (fromFile) |
| -dhe <dhename></dhename> | The DHE name (fromFile) |

To start the description of a new system such as RCSpec, using the focal plan **sta1x4** and the Dewar **RCSpecDwr** and the Torrent DHE gen2AFE_ID=542 you would type:

```
sysConfig -sysName RCSpec -fclPlane stalx4 -dewar RCSpecDwr -dhe gen2AFE_ID=542
-Or-
```

sysConfig -sysName RCSpec

and fill in the other fields when the sysConfig GUI appears. The result of this command should be a welcome window as displayed in Figure 12

| 🕱 Welcome to BORG Tools | | |
|-------------------------|---------------------------------------|------------------------------|
| Welcome to sysConfig | The Torrent System Configuration Tool | Assimilation is inevitable!! |

sysConfig Splash Screen Figure 12 and followed a few seconds later by the system identification screen.

| System Identification Dialog | × |
|------------------------------|--------|
| 4-digit Document Number | 0 |
| Responsible Engineer's na | ame |
| Enter System Name | RCSpec |
| Enter Customer ID | |
| | |
| ОК | Cancel |



When the fields on this screen are completed, pressing "OK" will remove the screen and bring up the *sysConfig* main GUI screen looking something the one shown in Figure 14.

| Configuring the RCSpec System (using Pmw 1.3) | | | | | | @ ! _ D × |
|---|----------------|--------------------------|-------|---------------------------------|----------------|--------------------|
| Starting logging: Friday 20100709.08 Status: | 48:27 - | | | | | |
| | | | | | | |
| Default configuration Directory /MNSN/soft_d | ev/cfg/_RCSpec | | | | | |
| Config Description file name RCSpec_System.c | lsc | | | | | |
| Edit System Info | | Read system config F | i 1e | Write system | config f | i 1e |
| Focalplane Name default | Dewa | r Name default | | Torrent DHE Name d | efault | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Current Pin List: | I. | I | | | Clear S | election |
| | | | | | | |
| ArrayName*PinDesg,> DewarConnecto | r*PinDesg, | -> DHEConnector*PinDesg, | | Do Connect | Delete | Connect |
| | | | | | Delete | |
| | | | | Sort by Sort Array Pin Dewar | | Sort by DHE Pin |
| | | | , i i | Set User Dflts | Set Att | |
| | | | | System dsc File | Print Print | Write |
| | | | | WireList | Print | Write |
| | | | | FPGA cfg Files | Print | Write |
| | | | | Default .mod File | Print | Write |
| 1 | | | | | | |
| | | | | | | |
| | | | | | | |
| | | с е. <u>г</u> . ч | 1 | - - - - - | , | 1 |
| Load EEPROM | | Save & Exit | | Exit (No : | save) | |
| | | | | | | |

sysConfig Main Screen Before Filling in Component Names Figure 14

You should now fill in the "**Focalplane Name**", "**Dewar Name**" and "**Torrent DHE Name**". After pressing <Return> or <Enter> in each of the name fields the details for the named component will be filled in, resulting in a screen like 0.





At this point the user can begin the process of connecting the focal plane functions and detector signals to the Dewar wall connectors and then to the DHE function connection points. However, for our example system we will use the basicCCD sysem. This system consists of a focal plane with a single e2v44-82 engineering grade detector in a universal Dewar called mosTest with a prototype Torrent DHE controlling the detector.

| Configu | | System (using Pmw 1.3) ith detHdElctn U ith detHdElctn J | | | | | | | | |
|---------|---------------|--|----------------------|-------------------|--------------|------------|--------------------|----------------------|------------|-------------|
| | - | irectory <mark>/MNSN/soft_</mark> name basicCCD_Syst e | - | CCD | | | | | | |
| Edit | t System Info | | | Read syste | em config Fi | le | Write s | ystem con | fig file | a |
| | Focal | olane Name basicCCD | Dewa | ar Name 🛛 mosTest | | Т | orrent DHE Na | me generic | 2AFI | |
| | | ls Mosaic Rows # of Arr | ys Dewar N mosTes | | | Yolta | ages | Boards | | |
| Dewa | | | J1 | J2 J3 J4 | FE1Biase FE | 1C1k FE1Y | ide FE2Biase F | E2C1k FE2V | ide tilit | 4 110ti |
| Functi | | | Cnotr | Type MilCirc | Cnotr | • Type | Misc # d | of Pins | 20 | <u> </u> |
| Cnotr | | # of Pins 20 | # of F | Pins 10 | | | Pin Descrip | tions | | 1 |
| | Pin De | escriptions | Pin | Designation | Desg S. | ignal Name | e Sgnl Type | Minimum | Maximum | <u> </u> |
| Desg | Signal Name | Sgnl Type Nominal | ··· | A 🛛 | | WBiasRtn0 | | 0.0 | 0.0 | |
| 1 | TS1_i+ | TEMP 0.0 | | B | | HVBias00 | BIAS | -5.0 | 30.0 | |
| 2 | TS1_v+ | TEMP 0.0 | | C | | HVBias01 | BIAS | -5.0 | 30.0 | |
| 3 | TS1_i- | TEMP 0.0 | | D | HVB2 | HVBias02 | BIAS | -5.0 | 30.0 | |
| 4 | TS1_v- | TEMP 0.0 | | E | HVB3 | HVBias03 | BIAS | -5.0 | 30.0 | |
| 5 | None | NONE 0.0 | | F | HVB4 | HVBias04 | BIAS | -5.0 | 30.0 | |
| 6 | TS2_i+ | TEMP 0.0 | | G | HVB5 | HVBias05 | BIAS | -5.0 | 30.0 | |
| 7 | TS2_v+ | TEMP 0.0 | | <u>н</u> | HVB6 | HVBias06 | BIAS | -5.0 | 30.0 | |
| 8 | TS2_i- | TEMP 0.0 | | | HVB7 | HVBias07 | BIAS | -5.0 | 30.0 | |
| 9 | TS2_v- | TEMP 0.0 | | | | што то и | - ACUD | | | |
| rent P: | 'in List: | | 1 | | I | | | CJ | lear Sele | ction |
| irrayNa | me*PinDesg, | > DewarConnect | or*PinDesg, | -> DHEConnect | or*PinDesg, | | Do Connect | D | elete Con | nect |
| | | | | | | | Sort by ray Pin | Sort by Dewar Pin | Sor DHE | t by Pin |
| | | | | | | | Set User Dflt | s S | et Attr D | flts |
| | | | | | | | öysten dsc Fi | le Pr | int | Write |
| | | | | | | | WireList | Pr | int | |
| | | | | | | | FPGA cfg Fild | es Pr | int | ₩rite |
| | | | | | | De | fault .mod F | ile Pr | int | Write |
| | | | | | | | efault GUI F: | ile Pr | int | Write |
| | oad EEPROM | 1 | | Save & Exit | | 1 | E ta | ; (No save) | | |

The **sysConfig** screen for the system is shown in 0.

basicCCD **sysConfig** Screen Figure 16

The following is a concise explanation of the parts of the main screen before continuing with how to use the system.

- The topmost grey section is the status message area. Error, warning and information messages will appear in this scrollable area as well as in the log file for the session. All messages are logged for review in case of a programming or formatting error.
- The next area, with the blue background, is the File control section. Here you can change the directory for storing the description File and output files, change the system identity information with the "Edit System Info" button or initiate a read or write of the system description file using the "Read system config File" and "Write system config file" buttons.
- The next section is the system component display area, divided into three parts. On the left is the focal plane description area with the focal plane name, detector type and geometry fields and the notebook with a page for the *Dewar Functions* and a page for each array labeled *Arry1* through N.
 The center part is the Dewar description area with the Dewar name, and a notebook page for each connector.
 The right part is the DHE description area with the DHE Name, The "Voltage" and "Beards" buttons and a page for each connector.

"**Boards**" buttons and a notebook page for each group of function connections and connectors in the DHE transition module.

- The light grey area below the component display is the temporary area that displays the pins being included in the current connection along with the "**Clear Selection**" button to abort a connection before creating it.
- Next on the left is the connection list giving the currently active connections for the system. On the right is the controls display with "Do Connection" and "Delete Connection" buttons; three "sort by" buttons to determine how the wire list output will be sorted; "Set User Defaults" and "Set Attr Defaults" buttons and finally "Print" and "Write" buttons to initiate a print or write to disk of the five types of outputs that can be seperately output. <u>NOTE:</u> This may be replaced at a later time with a dialog box that will allow printing or writing additional information.
- Finally at the bottom of the screen are the "Load TSM EEPROM", "Save & Exit" and "Exit (No Save)" buttons.

Most of the controls in the system component display area disabled. This allows the user to review the settings made using the lower level description files. Disabled controls are light gray with darker gray lettering. Enabled controls are darker gray with black lettering.

The main purposes of **sysConfig** is to document the design of the image acquisition system, specifically the focal plane Dewar and DHE component. Section 0 explains how to use **sysConfig** to create the wire list used to wire up the focal plane, Dewar and DHE connectors.

It is also used to associate user names with DHE hardware functions and to assign starting nominal values to the various bias and clock rail voltages.

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6.1 Using sysConfig to Create a Wire List

To connect a focal plane to the DHE the engineer must provide several pieces of information. One of these is the wire list. The wire list is a set of instructions to a technician telling them what connections should be made in the system. The wire list can be broken down into two parts; a list of connections from the detectors and internal Dewar functions to the Dewar wall connectors and a list of connections from the Dewar wall connectors to the TSM preamp and utility boards and TSM auxilary connectors.

Thes lists are created by connecting a pin on the focalplane to a Dewar pin and finally to a DHE pin. To make a connection the engineer clicks on a pin in each section of the **sysConfig** componets area. Selected pins are highlighted. See 0 for an example of a partial connection. When a pin from each section is selected, the user can press the "**Do Connect**" button to create the highlighted connection. This will create a line in the Connections area and pop up a window, as shown in 0, that will allow the engineer to set the nominal max and min values for the DHE function being used. If the engineer decides the proposed connection is faulty, he or she may use the "**Clear Selection**" button to erase the proposed connection. Once the connection is made and added to the Connections list the pins will be highlighted with a tan background. See 0.

| | Type Mosaic Co | ls Mosaic Rov | us # of Arrys | • | Dewar Name mosTest | # of Cnotrs | | Voltage | es | Boards | | |
|----------------|------------------|---------------|---------------|---------------|-----------------------|------------------|------|-------------|-----------|---------|---------------------------|----------------------------|
| Dewa Functi | ir Lons Arry1 | # of Pins | 20 | | J1 J2 Cnotr Type | J3 J4 MilCirc | | | | Pins | ide tilit ; 20 | J1Ut |
| | Pin D | escriptions | , | | Pin Desi | | Desg | Signal Name | Sgnl Type | Minimum | Maximum | D |
| Desg | Signal Name | Sgnl Type | Nominal . | | A | | HVRO | HVBiasRtn0 | AGND | 0.0 | 0,0 | īΕ |
| 1 | TS1_i+ | TEMP | 0.0 | | B | — Fi | HVBO | HVBias00 | BIAS | -5.0 | 30.0 | r |
| 2 | | TEMP | 0.0 | | | — | HVB1 | HVBias01 | BIAS | -5.0 | 30.0 | ſ |
| 3 | TS1_i- | TEMP | 0.0 | | | | HVB2 | HVBias02 | BIAS | -5.0 | 30.0 | Γ. |
| 4 | TS1_v- | TEMP | 0.0 | | E | | HVB3 | HVBias03 | BIAS | -5.0 | 30.0 | [- |
| 5 | None | NONE | 0.0 | - - | F | | HVB4 | HVBias04 | BIAS | -5.0 | 30.0 | Ι. |
| 6 | TS2_i+ | TEMP | 0.0 | | G | | HVB5 | HVBias05 | BIAS | -5.0 | 30.0 | |
| 7 | TS2_v+ | TEMP | 0.0 | | Н | | HVB6 | HVBias06 | BIAS | -5.0 | 30.0 | I I |
| 8 | TS2_i- | TEMP | 0.0 | | J | | HVB7 | HVBias07 | BIAS | -5.0 | 30.0 | $\Pi_{\overline{\lambda}}$ |
| 9 | TS2_v- | TEMP | 0.0 | $\overline{}$ | j v | | | | ACUD. | | | |
| 40 | 107 | LIQUE | | | | | | | | | | |
| ent P | in List: | dfCnc | t*1, | 1 | | J1*A, | 1 | | | C | lear Selec | tio |

Partially Made Connection Figure 17

| Signal Connection Value Display | | I@I _ D X |
|--|------------------------|---|
| User Attribute Name TS1_i+ | is Connected to I_SRC1 | |
| Array: dfCnct Pin: 1 Signal Name: TS1_i+ Sgnl Type: Temperature Sensor | Dewar Cnctr: J1 Pin: A | DHE Cnctr: Utility Pin: E7 Detector Voltage Minimum Maximum Default |
| Temperature Sensor Nominal Value 0.0 | | 0.0 0.0 0.0 |
| | | |
| ОК | [| Cancel |

Signal Value Display for Connection Figure 18

| Array | Type Mosaic Co | ls Mosaic Row | us # of Arrys | Dewar Name | # of Cnctrs | | Voltage | | Boards | | |
|--|----------------|---------------|-----------------|---------------------|--------------|------------|--------------|------------|---------|-------------------|--------------|
| e2vl | | 1 | 1 | mosTest | 4 | | TUICage | 1 1 | buarus | _ | |
| Dewa F uncti Cnctr | ons Hrry1 | # of Pins | 20 | J1 J2 Cnotr Type | J3 J4 | | | | Pins | ide Itilitų 15 | J1Ut |
| chica | | | 20 | # of Pins | 10 | | | | | | |
| | Pin D | escriptions | | Pin Des | ignation | Desg | Signal Name | Sgnl Type | Minimum | Maximum | D |
| Desg | Signal Name | Sgnl Type | Nominal | A | | E1 | TEMPSNS2- | TEMP | 0.0 | 0.0 | |
| 1 | TS1_i+ | TEMP | 0.0 | В | | E2 | TEMPSNS2+ | TEMP | 0,0 | 0,0 | |
| 2 | TS1_v+ | TEMP | 0.0 | C | | E3 | TEMPSNS1- | TEMP | 0.0 | 0,0 | Ĩ |
| 3 | TS1_i- | TEMP | 0.0 | D | | E4 | TEMPSNS1+ | TEMP | 0,0 | 0,0 | Γ. |
| 4 | TS1_v- | TEMP | 0.0 | E | | E5 | I_SRC1_RET | OGND | 0.0 | 0.0 | Γ. |
| 5 | None | NONE | 0.0 | F | | E6 | I_SRC2_RET | OGND | 0,0 | 0,0 | I _ |
| 6 | TS2_i+ | TEMP | 0.0 | G | | E7 | I_SRC1 | DVLT | 0,0 | 0,0 | |
| 7 | TS2_v+ | TEMP | 0.0 | Н | | E8 | INPWR_SHIELD | OGND | 0,0 | 0,0 | ī |
| 8 | TS2_i- | TEMP | 0.0 | J | | E9 | SHUTTER_RTN | OGND | 0.0 | 0.0 | Π_{\neg} |
| 9 | TS2_v- | TEMP | 0.0 | | | | DDEEL ACH AN | тинт | | | r jv |
| 40 | 107 | HOUE | | | | | | | | | |
| ent Pi | in List: | | | I | | I. | | | CJ | lear Selec | tion |
| rrayNa | me*PinDesg, | > De | ewarConnector*F | inDesg, -> | DHEConnector | ∾*PinDesg, | •••• | Do Connect | D | elete Conn | nect |
| fCnct: | 1=>J1:A=>Utili | tu:E7 | | | | | | t by | Sort by | Sort | hu |

Component Display and Connection List after a Connection is Made Figure 19

The cfg files for the hardware modules and Dewar/detector will contain information to prevent the user from connecting a clock function to a voltage without special overrides.

- 6.2 Creating a User Defaults List
- 6.3 Creating Other Attributes Defaults List
- 6.4 Assigning User Names to DHE Functions
- 6.5 Using the *sysConfig* Documentation Functions

Appendix I TSM .cfg File Format

Appendix II Function and Signal Categories

The connections made by the **sysConfig** program are checked for consistency. The DHE function and the detector signal must have the same type to be connected. This is enforced by the program but a detector engineer can override this requirement. What follows is all the signal and function types used by the **assimilate** program. The last three (CMND,CNST,SFTW) are generally not used by detectors.

| AGND | a detector analog ground signal. |
|------|--|
| BIAS | a detector bias voltage. |
| DCLK | detector clock signal – a control clock for the detector. These break down into an UpperRail, a LowerRail and a logical level. Connecting any one of the three signals to a detector pin automatically connects the other two signals. |
| DPWR | a detector power signal – a voltage usually connected to a fixed bias level. used by both dewar and DHE descriptions. |
| DVLT | a detector voltage not otherwise classified (e.g. logical controls as in OTA's. or hardware gain controls). |
| LGCL | an attribute that is a logical connection to the detector (i.e. rowCount, Number of outputs, pipeline enables, etc.) |
| OGND | other detector ground signals. |
| TEMP | a temperature control signal. |
| VOUT | a detector video output. This breaks out into the video signal and an offset voltage for that signal. |
| NONE | an attribute that does not connect to the detector (i.e. power module control signals, telemetry read back attributes, etc.) |
| CMND | |
| CNST | |
| SFTW | connects to Dewar only through other values. |