

## 6. Dspix Utility

The **dspix** utility can be used to debug the interface hardware to the RVP6 or RVP7 signal processor, and to help in developing new software using the signal processor. It can help to localize a problem when the DSP is suspected of not performing as documented in the appropriate user's manual.

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### 6.1 Invoking Dspix

**Command**

**dspix -nochat**      or      **dspix**

### 6.2 Dspix Commands and Prompts

When started with the “-nochat” option, **dspix** displays a prompt such as:

**[110] :**

For parallel interfaces, the prompt shows (in binary form) the three status lines coming from the DSP. For SCSI interfaces, the prompt shows the equivalent information as obtained through SCSI bus queries. The least significant prompt bit, when 1, indicates that data is available in the DSP output FIFOs. The other bits are unused.

The list of available commands is shown in Table 6–1.

**Table 6–1: Dspix Commands**

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|             |   |
|-------------|---|
| <b>*</b>    | Perform a complete power-up restart of the DSP.   |
| <b>*f</b>   | Clear the DSP output FIFO.  |
| <b>*n</b>   | Clear the measured noise levels.  |
| <b>chat</b> | Access DSP setup terminal information. The terminal behaves as if it were a TTY plugged into the DSP through the serial edge connector. |

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**Table 6–1: Dspix Commands (cont.)**

|                      |  |
|----------------------|--|
| <b>d [n [m] ]</b>    | Display <i>n</i> words starting at location <i>m</i> . The data are shown in both Hex and Signed Decimal format. Variations on the d command are: du which displays entirely in Unsigned Decimal, and dx which displays entirely in Hex. |
| <b>q or e</b>        | Exit   |
| <b>f n m [#]</b>     | Fill, write <i>n</i> , <i>m</i> times, using DMA size #  |
| <b>gparm</b>         | Read the current “gparm” values, and print them in a format that is easy to read.  |
| <b>? or h</b>        | Help, print command summary  |
| <b>r [n [#]]</b>     | Read up to <i>n</i> words, DMA size #  |
| <b>rays</b>          | Display history for the last 40 rays that were processed. The table shows the starting and ending Azimuth and Elevation, the number of samples, and the processing time for each ray.  |
| <b>repeat [n]</b>    | Repeat line <i>n</i> times   |
| <b>w n [n n ...]</b> | Write word   |
| <b>~ [t]</b>         | Sleep <i>t</i> milliseconds (default 1000)   |
| <b>! [n]</b>         | Reexecute last line <i>n</i> times   |
| <b>;</b>             | Command separator  |

## 6.3 Sample Dspix Session

Using the commands in the following sample session, you can manually request the internal processor parameters, and display them in numerical format. Refer to the *Signal Processor User’s Manual* for a detailed listing of the available DSP opcodes.

```
$ dspix -nochat
```

```
Digital Signal Processor Examiner (DSP#1)
```

```
[110] : w 9
```

```
1 Words were written.
```

```
[111] : r
```

```
64 Words were received.
```

```
[110] : d
```

```
0000/ 0:    e000 0096 07d1 e13e    -8192    150    2001   -7874
0004/ 4:    00b6 0780 0514 0000     182    1920    1300     0
0008/ 8:    0000 0280 0000 0000      0     640      0      0
000c/ 12:   002d a7d6 001e 0096     45 -22570     30    150
0010/ 16:   0096 0000 00fa 7530     150      0     250   30000
0014/ 20:   07d0 1770 2ee0 5dc0    2000    6000   12000   24000
```

|       |     |      |      |      |      |        |      |       |        |
|-------|-----|------|------|------|------|--------|------|-------|--------|
| 0018/ | 24: | 842b | 0000 | 2710 | 2710 | -31701 | 0    | 10000 | 10000  |
| 001c/ | 28: | 07d0 | 07d0 | 0017 | 0666 | 2000   | 2000 | 23    | 1638   |
| 0020/ | 32: | 000d | fedf | 0066 | 0050 | 13     | -289 | 102   | 80     |
| 0024/ | 36: | fd89 | 0005 | 001e | 0000 | -631   | 5    | 30    | 0      |
| 0028/ | 40: | 0000 | 0000 | 0000 | b3f6 | 0      | 0    | 0     | -19466 |
| 002c/ | 44: | 0033 | 007a | 0000 | 0780 | 51     | 122  | 0     | 1920   |
| 0030/ | 48: | 8000 | 0000 | 0000 | 0000 | -32768 | 0    | 0     | 0      |
| 0034/ | 52: | 0000 | 0000 | 0000 | 0000 | 0      | 0    | 0     | 0      |
| 0038/ | 56: | 0000 | 0000 | 0000 | 0000 | 0      | 0    | 0     | 0      |
| 003c/ | 60: | 0000 | 0000 | 0000 | 0000 | 0      | 0    | 0     | 0      |

The corresponding results of a **gparm** command can also be shown:

[110] : **gparm**

===== GPARM Read Back =====

Code Revision 14      Serial #: None

L-Status: 0x0000    I-Status: 0x0280    Diagnostics: 0x0000 0x0000

Current A/D Samples:    I:5    Q:0    LOG:30

Requested Trigger: 600.00Hz    Trig-Out: 600.00Hz    Trig-In: 599.40Hz

Last PROC Starting and Ending rates: 600.00Hz, 600.00Hz

Maximum Trigger Rates:    3000.00Hz, 1000.00Hz, 500.00Hz, 250.00Hz

Trigger Count: 2014614    Wave: 0    PW: 0    PW-patterns: 0x842b

Bins in Range Mask: 150      Range Averaging: 1

Last AQ Bin Count: 150      Last Valid Bin Count: 150

AZ Tags: 0x6539 (142.34)      EL Tags: 0x00b6 (1.00)

Noise Range: 250km      Noise PRF: 200.00Hz

LOG Noise: 30.00      LENM: 30.00      LENS: -512.00

I-Mean: 5.08    I-STD: 0.25    Q-Mean: 0.00    Q-STD: 0.03

SOPRM Flags: 0x0017

Thresholds:    LOG: 0.81dB    WSP: 5.00dB    SQI: 0.40    CCOR:

-18.06dB

LOG Slope: 0.400    Cal Refl: -39.44dBZ    Sample Size: 45

The **chat** mode of **dspix** provides a very convenient method of accessing the internal setup information in the signal processor. You may enter **chat** mode directly by starting **dspix** without the “-nochat” argument, or you may enter it via the “chat” command. The former method is much more convenient.

In **chat** mode, you can access the TTY setup commands from the host computer, as if it were a terminal plugged directly into the DSP. When you are in **chat** mode, the normal square-bracket prompt disappears. Begin the dialog with the RVP7 exactly as you would on a real TTY, i.e., by typing the <ESC> key.

[110] : **chat**

<ESC>

SIGMET Incorporated, USA

RVP7 Digital IF Signal Processor Rev.B/13

RVP7> ?

Command List:

F: Use Factory Defaults

```
S: Save Current Settings
R: Restore Saved Settings
M: Modify/View Current Settings
    Mb - Burst Pulse and AFC
    Mc - Board Configuration
    Mf - Clutter Filters
    Mp - Processing Options
    Mt<n> - Trigger/Timing <for PW n>
    Mz - Transmitter Phase Control
    M* - Stand-alone Settings
    M+ - Debug Options
P: Plot with Oscilloscope
    Pb - Burst Pulse Timing
    Ps - Burst Spectra and AFC
    Pr - Receiver Waveforms
    P+ - Visual Test Pattern
V: View Jumpers and Status
?: Cmd list (?? Settings list)
*: Power-Up Reset
Q: Quit
>
```

Refer to the *Signal Processor User's Manual* for a description of how to use the interactive TTY setup commands.

One of the more intriguing features of **dspix** is that it will generate an X-Window version of the oscilloscope plots that are produced by the RVP7 plot commands. The scope window will popup as soon as a plot command is entered, and the window will disappear when the plot command is exited. An example of a "ps" plot is shown below.

Before exiting from **chat** mode, disconnect the terminal from the DSP using the **q** command. **dspix** waits for you to press Ctrl/C, then returns to the **dspix** prompt:

```
> q
Exiting Setups...
^C
[110] :
```

