DRAFT August 11, 1998

The RTF card Driver

Steve Eichblatt, Fermilab
Steve Furlanetto, Fermilab

1 Introduction

This document describes the basic functionality of the RTF card, and the software tools that perform them.

2 Design

The RTF driver performs in conjunction with the `GPIB protocol`. See ref [1, 2] for a detailed description. The basic idea is that commands are issued from a perl script and are sent *via* tcp/ip to a server which issues the GPIB commands to perform the action on the card.

3 Instructions

The following sections list the methods that apply to instances of the RTFcard class. These commands are issued with the dereferencing operator. Here is an example of a session which interacts with the RTF card. All entries after ## are my comments, and do not need to be typed.

```
telnet fnpx19.fnal.gov
username: cdmsuser
password: ********

cdmsuser>  0% cd perl                   ## move to home directory of rtf
cdmsuser>  0% rtf.pl                    ## run the rtf program

perl: $module = 10                      ##
perl: $rtf[$module]->print              ## print status of card in slot 10.
perl: $rtf[$module]->help               ##
perl: $rtf[$module]->setFilter("P1",3)  ## change the filter setting
perl: $rtf[$module]->print              ## print the status again.
perl: module 4                          ## change module to 4
perl: exit

cdmsuser>  0% exit
```

Note that, as written, the program defaults to creating a connection to the Fermilab GPIB box, subrack 3, module 8 (it does create modules for all 22 slots). Several command line switches are allowed in order to change this connection:

-h (**String** `hostname=ppdm06.fnal.gov`)
Sets host to `hostname`.

-p (**int** `port=2345`)
Sets port to `port`.

-r (**int** `subrack=3`)
Sets subrack to `subrack`.

-m (**int** `module=8`)
Sets module to `module`.

-s (**void**) Disables communication to server (meant for script writing).

This software contains a useful persistence feature. After executing any command to the GPIB box, it will record the card status in a file called `/tmp/hostname-RTFcard-subrack-module.out`, where `subrack` is the subrack of the card and `module` is the module number of the card. If the `-s` switch is used, `hostname` becomes `script`. When `rtf.pl` is run again, it will automatically search for this file and reload those values into memory. This feature is designed to ensure that the hardware and software remain synchronized. If the rack is powered down, be sure to re-initialize the settings when the program is run again.

3.1 General Information

help (**void**)
Prints a subset of the commands that can be issued to the RTFcard.

print (**void**)
Prints Information about the GPIB box and the card including module number and the status bits of the Control Registers.

cardinfo (**void**)
Reads back the type of card, serial number of the card, and the version number of the card.

cardtype (**void**)
Prints card type that computer believes card to be.

saveScript (**String** `filename`, **int** `overwrite`)
Saves all subsequent GPIB commands to `filename`. Commands are saved in format readable by LABView interface and Perl script reading routine. The `overwrite` field is optional (if omitted, and relevant, user will be prompted for it). The possible choices are: `1` to append to existing `filename`, `2` to overwrite `filename`, or `3` to cancel if `filename` exists.

endScript (**void**)
Ceases saving commands to a file.

enableBox (**void**)
Enables communication with GPIB box. Note that this only works for current box.

disableBox (**void**)
Disables communication with GPIB box. Note that this only works for current box.

accumulate (**void**)
Creates a queue of commands for the GPIB box. Will not execute them until "execute" command is given; then it will do them all at once.

unaccumulate (**void**)
Turns off accumulation feature. Note that the remaining items in the queue are NOT executed.

execute (**void**)
Executes all commands in the GPIB box queue.

powerUp (**void**)
Resets control registers and DACs to the values that are believed by the software to be true. Designed for use when power is shut off to board without reloading program.

toFile (**String** `filename`)
Saves current card settings to file `filename`.

fromFile (**String** `filename`)
Reads card settings from `filename` and sets registers and DACs to those settings.

init (**void**)
Resets registers and DACs to initial values (DACs set at zero, filters selected to be 0, and all channels disabled).

3.2 Setting up the DAC's

PHiDAC (**float** `Voltage`)
Sets the Phonon high level trigger DAC to `Voltage` Volts.

PLoDAC (**float** `Voltage`)
Sets the Phonon low level trigger DAC to `Voltage` Volts.

QHiDAC (**float** `Voltage`)
Sets the Charge high level trigger DAC to `Voltage` Volts.

QLoDAC (**float** `Voltage`)
Sets the Charge low level trigger DAC to `Voltage` Volts.

PHiThresh (**float** `Voltage`)
Sets the Phonon high level trigger threshold to `Voltage` Volts.

PLoThresh (**float** `Voltage`)
Sets the Phonon low level trigger threshold to `Voltage` Volts.

QHiThresh (**float** `Voltage`)
Sets the Charge high level trigger threshold to `Voltage` Volts.

QLoThresh (**float** `Voltage`)
Sets the Charge low level trigger threshold to `Voltage` Volts.

3.3 Setting up the Control Registers

Enable (**String** `channel`)
Enable **channel**. Channels are "P1", "P2", "P3", "P4", "Qi","Qo". If `channel` is omitted, enables all channels.

EnableP (**void**)
Enables channels "P1", "P2", "P3", "P4".

EnableQ (**void**)
Enables channels "Qi","Qo".

Disable (**String** `channel`)
Disable **channel**. Channels are same as for Enable. If
tt channel is omitted, disables all channels.

DisableP (**void**)
Disables channels "P1", "P2", "P3", "P4".

DisableQ (**void**)
Disables channels "Qi","Qo".

setFilter (**String** `channel`,**int** `number`)
Set the Filter on `channel` to `number`.
filters are
0: No input filter
1: 1 kHz notch filter
2: Times 10
3: Bessel Low-Pass filter
If `channel` is omitted, sets all channels to appropriate filter.

References

[1] Steve Eichblatt, Sae Woo Nam CDMS note 9712002. *The CDMS Net Protocol*

[2] Steve Eichblatt, Steve Furlanetto *The BLIP Card Driver*