

January 27, 2008

L1Cal Firmware Update Procedure

General Information:

Official home of TAB/GAB firmware and hardware parameters:

/tcc/L1Cal_IIb_Work/Tabgab_Packages

Each official release, e.g. version_2.8, contains:

--> Firmware for every TAB/GAB chip (SWA, global, LVDS, and S30)
with extension ttf.

--> Also hardware parameter files:

tab_param.txt, gab_param.txt, vmesc1_param.txt

--> COMMENTS file describing changes since previous release.

For example here is what is in the version_2.8 directory:

```
mulhearn@d0tcc3>ls /tcc/L1Cal_IIb_Work/Tabgab_Packages/version_2.8/
```

```
COMMENTS
```

```
gab_stratix_03.ttf
```

```
tab_stratix_02.ttf
```

```
tab_stratix_07.ttf
```

```
gab_param.txt
```

```
gab_stratix_04.ttf
```

```
tab_stratix_03.ttf
```

```
tab_stratix_08.ttf
```

```
gab_stratix_00.ttf
```

```
tab_param.txt
```

```
tab_stratix_04.ttf
```

```
tab_stratix_09.ttf
```

```
gab_stratix_01.ttf
```

```
tab_stratix_00.ttf
```

```
tab_stratix_05.ttf
```

```
tab_stratix_10.ttf
```

```
gab_stratix_02.ttf
```

tab_stratix_01.ttf
tab_stratix_06.ttf
vmesc1_param.txt

Columbia has committed to long term support for providing these packages, by Columbia engineers and/or local experts.

To adopt a new version, start by obtaining the package directory.
For example, local expert Mike provides tar ball for new firmware package
Version 2.9: d0tcc3:~mulhearn/version_2.9.tgz

Step 1: Unpack the tar ball in the official TabGab_Package directory:

```
cd /tcc/L1Cal_IIb_Work/Tabgab_Packages
```

then e.g.

```
tar -xzf ~mulhearn/version_2.9.tgz
```

check that everything is there

```
ls version_2.9
```

Step 2: Edit the initializing file which tells TCC which TAB/GAB package to use. This information is contained in the file:

```
/tcc/L1Cal_IIb_Work/Config/Boot_Auxi_TabGab.mcf
```

It is logically assigned to a file with an extension of the present trigger-version (.mcf.v15, for instance, that assigns the firmware version_2.9). A version with extension of .mcf.v16, which assigns the firmware version_3.00, also exists; just changing the logical assignment is also sufficient.
Otherwise:

Change the following line to the correct version, in this example 3.00:

```
!-----  
! Set TabGab Package Version  
!-----
```

TabGab_PackageVersion: "version_3.00"

Step 3: Now tell TCC to reload the Boot_Auxi_TabGab.mcf file.

Using the L1Cal_IIb_GUI (shown below):

From main menu select: TCC Comm File

Then select "Locate TCC Com File",

You may have to cd to "Config" directory by selecting "Up" then "Config".

Then select: "Boot_Auxi_TabGab.mcf".

Execute the file by pressing: "Master ComFile".

If you follow the (make sure it is the latest!) log file, with e.g.

```
tail -f  
/tcc/L1Cal_IIb_Work/LogFiles/L1Cal_IIb_TCC/L1Cal_IIb_Tcc_2007081  
4_V5_2_C.LOG\;1 (this one command line)
```

Then you will see the package version change, e.g.:

```
S$ Setting TabGab Package Version to <version_2.9> %%21-Aug-2007  
12:46:49
```

Step 4: Note that this has not actually changed the firmware yet; just the version that will be loaded the next time the firmware is loaded. To download the firmware use the L1Cal_IIb_GUI (shown below).

From the main menu select: "Control/Status"

Then select: L1Cal Non-Oper.

This tells the TCC that the L1Cal isn't operational. If this step were omitted, then TCC would record TAB/GAB status errors while the firmware is being downloaded and until the TAB/GABs are reinitialized.

In log file you should see e.g.:

```
S$<TrgMgr Set L1Cal Not Operational> %%21-Aug-2007 13:00:56
```

Next from main menu, select "Config TAB/GAB".

Then select Full Config: "Execute: Configure_FPGAs_TabGab.cdf".

Again following along with the log file you should see lots of output like:

```
I$ Configuring TAB/GAB module #7  
I$$--> package version is 2.9, will set firmware version after global  
configure.  
I$$--> doing preconfig type a first...  
I$$ ...made nconfig go low (type a)  
I$$ ...made nconfig go high (type a)  
I$$--> programing regular stratix: module 7, chip 0  
I$$ ...downloading  
/tcc/L1Cal_IIb_Work/Tabgab_Packages//version_2.9/tab_stratix_00.ttf  
to module 7  
I$$ ...done: type is a, last byte is 255, number read is 741068, byteUpper  
is 0.
```

which shows that the correct version is being picked up.

Step 5: Initialize the L1Cal using the L1Cal_IIb_GUI (shown below):

On the GUI's Main page, click on the following boxes in order:

- Simu COOR Msg
- Initialize
- Send Request

Step 6: Important: Ensure that the DO trigger version is incremented before any new physics data is taken!

TROUBLE SHOOTING:

To back out a change:

- Step 1: Repeat all of Step 2 above, but revert back to the previous version, in this example version_2.9.
- Step 2: Repeat all of the remaining steps, but communicate with trigger experts about "Step 6" in case they are expecting a change.
- Step 3: Bookkeeping: Move the failed version, e.g. version_2.9, to e.g. failed_version_2.9 as our convention is that the highest version_X.Y in the official directory is the one being currently run.
- Step 4: Get help from the Nevis engineers or local expert to resolve the problem with the new version.

Note that this has never been necessary so far.



L1Cal_IIb_GUI