**BOT Lookup Table Testing**

The procedures for testing the BOT table updates were originally created at a time when INS was not involved in verifying the contents of the BIT files, and when the procedures within the ETC group were not as formalized as they are now. Given that both of these groups are now intimately involved in verifying the content of the files, we have updated our testing to take advantage of the work being performed by those groups. Note that for both of the major APT software (the Phase I and Phase II) releases, an update to the BOT tables will be performed.

It is important to note that by reducing our testing (eliminating our verification of the contents), we are assuming the INS testing is sufficient, and that the interface between the ETC group and INS is correct (i.e. that the BIT files delivered to INS for testing are the ones used to generate the spreadsheets).

# Overall Process

Here is the process in its entirety.

1. If any new configurations are to be included, the ETC group will update the query-generation file.
2. The BIT files and Excel spreadsheets (containing a summary of the differences between the new files and the previous ones) are placed on Basecamp (Chris Sontag).These files are used by INS for their testing, and by APT for ingest into BOT. As these files should be valid, APT will begin the ingest process while the INS review is occurring. If INS finds problems, APT will need to re-ingest revised files.
3. APT (Chris) runs the Bot Table Tool (or BOTTT), which takes the new BIT files and generates new Instrument lookup xml files.
4. APT (Chris) ingests the files into APT (on the branch), and the APT testers (Ron and David) do their testing. The testing consists of 2 parts:
	1. Verify BIT table to BOT table conversion
	2. Verify that the new BOT tables are ingested into APT

These tests are detailed below.

1. If any problems are found, issues are posted on Basecamp for resolution with the ETC group and the Instrument teams. Repeat steps 2-4 above with the correct files.
2. INS will provide notification of the status of the BIT files (either the delivered files have been validated or they will deliver new validated files for re-ingest) no later than 3 weeks prior to the APT release date.
3. Once the files are validated by INS (and have passed APT testing), they are pushed to Main.

# Test 1: Verify BIT table to BOT table Comparison

Compare the BIT table values with the BOT table values by finding a table entry (configuration) that changed in the new tables using the Excel spreadsheets, and confirming that the new values are in the BOT table. We just need to do one configuration per instrument per catalog (GSC2, Galex, or 2MASS, as appropriate) since we are just verifying that the software has not broken.

BIT table format:

<Response>

<BrightestPixelRate>2.05617148621</BrightestPixelRate>

<validRequest>true</validRequest>

<ImageRate>12421.0258605</ImageRate>

<query>type=bot&amp;magnitude=10&amp;config=COS/NUV&amp;filter0=G285M&amp;centralWavelength=2709&amp;aperture=PSA&amp;obswave=2709&amp;requestCount=2&amp;request0=BrightestPixelRate&amp;request1=ImageRate&amp;stellarType=O5V&amp;magType</query>

</Response>

To get access to the BOT tables, you need to unpack the BOT.jar file in the classes directory of APT (I use 7Zip, but you can use whatever you want); you will want the Instrument Lookup table files (xml files).

BOT table format:

<ResponseTable spectralElement="g285m" responseType="local" aperture="psa">

 - <WebETC\_Request>

 <centralWavelength>2709</centralWavelength>

 <config>COS/NUV</config>

 <aperture>PSA</aperture>

 <magnitude>10</magnitude>

 </WebETC\_Request>

 <ReferenceParameters>

 <VMagnitude value="10"/>

 <CentralWavelength value="2709"/>

 <ExposureTime value="1"/>

 </ReferenceParameters>

 <Response value="2.05617148621" spectralType="O5V"/>

 …………………………..

 <Response value="0.00122650041305" spectralType="M2V"/>

 </ResponseTable>

# Test 2: Verify that the new BOT Tables are ingested into APT

Run an exposure through BOT and confirm (by doing a hand calculation) that the results used the new tables by finding a table entry (configuration) that changed in the new tables using the Excel spreadsheet, and confirming that it was used in the BOT calculation. We just need to do one configuration per instrument per catalog (GSC2, Galex, or 2MASS, as appropriate) since we are just verifying that the correct table was ingested.

Hand calculation:

Configuration: COS/NUV, G285M/2709, PSA, O5V, Exposure time 1s

Fpg=10.5, Jpg=10.0 🡪 V = 10.3

BOT table local countrate (V=10) = 2.05617148621

Scaled countrate = 1.560

BOT value = 1.560