AutoDev Module Use

AutoDev Module Use   **Description of Controls**   **Background Notes**

Purpose:
- To intelligently apply a global stretch to the image for inspection and development purposes

Description:
 For a general overview see Autodev.
- AutoDev is designed to show up the faults in an image - that is why most images look bad when doing the initial global stretch.
- When given a suitably cropped and Wiped image AutoDev is designed to find the optimal global stretch.
- Autodev employs an enhanced algorithm that yields optimal global dynamic range assignment - without masking artifacts - while being easy to control.

When to use:
- For the initial global stretch - Just after loading the image in StarTools - to allow initial viewing of the features and problems associated with the image.
- For the final global stretch - After using the Wipe module.

Workflow:
See the Quick Start Tutorial for a quick generic workflow.

Full Workflow Example:

AutoDev-{Band/Lens}-Bin-Crop-Wipe-AutoDev (or Develop)-{Decon/Sharp/Contrast/HDR/Flux/Life}-Color-{Filter}-Denoise-{Layer/Magic/Heal/Repair/Synth}
Key: {...} optional modules

Method:
1. Set Ignore Fine Detail - to ensure AutoDev ignores noise, dust specks and other dark anomalies.
2. Select Region of Interest (ROI):
3. Highlight the subject, or a part of it, to select the range of levels that AutoDev should allocate dynamic range to.
4. Sometimes highlighting an area within the subject gives the optimum dynamic range.
5. In rare cases, possibly due to the subject or the amount of noise, AutoDev does not produce a good result. In these cases it is necessary to use the Develop module instead.
6. If you make a mistake, the 'Reset' button discards all the changes since you started using the module.
7. 'Keep' the result when you are happy with it - Unless you plan to use the Band module.

### What results to look for:

Initial global stretch
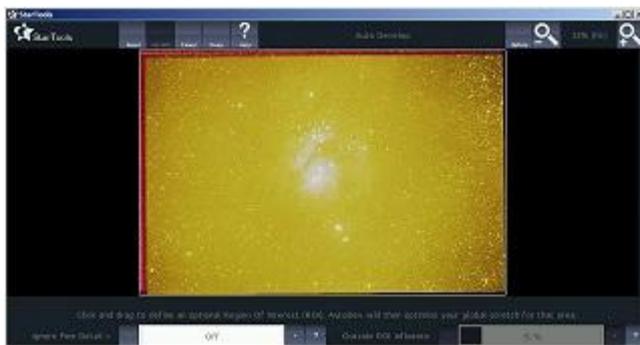
Initial Global Stretch

AutoDev will highlight any of the following:
- Stacking Artefacts - remove later with the Crop module.
- Colour bias (remove this later with the Wipe module)
    - red or yellow/brown cast - skyglow that has been white balanced.
    - teal, blue or green cast - skyglow that has not been white balanced.
    - bright blue-green cast - skyglow filtered using a light pollution filter.
    - missing yellow (e.g. no yellow stars) - indicates use of light pollution filter.
- Vignetting - darkening towards the corners, Amp Glow - remove later with the Wipe module.
- Dust specks - remember to mask out when using the Wipe module.
- Noise.
- Banding - use the Band module next - but don't 'Keep' the AutoDev result.

- Debayering Problems - checkerboard pattern. See the description [here](#).
- Coma - fix later with the Lens module.

Final global stretch
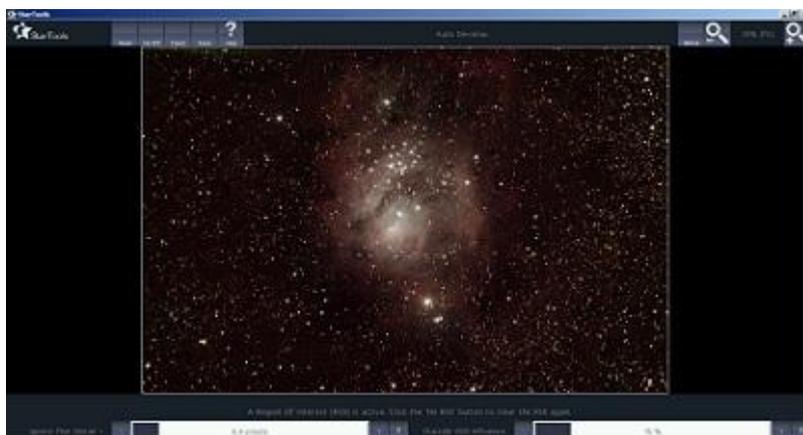
Look for:
- Good dynamic range in the area of interest, showing all the major structures of interest. Don't worry about the detail within the structures - they will be targeted later.
- Controlled noise in the background - if not go back and do a less aggressive stretch (by changing ROI selection). The Denoise module can handle a reasonable amount of background noise but has problems when it is excessive.
- Colour Bias, Vignetting, Dust specks, etc. should be well controlled or removed by this stage. If not you may need to go back and redo the Wipe or Crop.

Ways of Getting Better Results:
- Use Flats and Darks (or Dither) when creating the original image
- Use the Bin module at the start of processing if the original image is oversampled.
- If you continue to have problems with background noise you may want to try the Develop module instead. It may provide the level of control you need.

After Use:
- After initial global stretch - use the Band module if needed - followed by Lens-Bin-Crop-Wipe modules - as needed
- If using the Band module next - don't 'Keep' the initial stretch.
- After final global stretch - Consider using the Decon, Sharp, Contrast, HDR modules as needed.

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Presets
- Reset - Resets controls 'Ignore Fine Detail' to 'Off' and 'Outside ROI Influence' to 0%.
- No ROI - Clears any Region of Interest (ROI) set.

Ignore Fine Detail
Allows AutoDev to ignore small features such as noise when allocating dynamic range.
- Particularly important when the image has a low signal to noise ratio (SNR).
- Default is Off. Range is Off then 1.1 to 50.0 pixels.
- Increase to exclude noise - usually until the image doesn't darken any more.

Outside ROI Influence
Defines how much dynamic range to reserve for outside the Region of Interest (ROI).
- Defaults to 15%. Range is 0% to 100%.
- Reduce if you have a high dynamic range subject and you want to allocate more dynamic range to the subject.
- Avoid AutoDev clipping the data by never reducing this value to 0%.
- Increase if there is some detail outside the ROI which you want to show up.

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The AutoDev module, along with the Develop, Contrast and HDR modules, provide automated stretching at all levels of detail. These modules replace the traditional curve-based adjustment of stretching.

Thanks
Many thanks to Ivo for his feedback and tireless support. Thanks also to others who have contributed.