Tutorial for ImageMagick and DirectXTex

Note: Any of the commands below can just be copy-pasted. You don't need to re-type them!
Note: It was reported that on some systems you have to add "magick" before the "mogrify" command.

What you're looking for:

BC1 = NO transparency & NO alpha
BC2 = NO transparency & YES alpha <←- NOT USED in KSP
BC3 = NO transparency & YES alpha
BC4 = “RGTC” (red aka ultra red) encoding <←- Normally not in KSP
BC5 = “RGTC” (green aka ultra red) encoding <←- Normally not in KSP
BC6f = RGB to HDR & NO alpha, transparency
BC7, modes 1 to 3 = RGBA & NO alpha
BC7, modes 7 to 7 = RGBA & YES alpha

RGBA = Red, Green, Blue, Alpha
RGB = Red, Green, Blue

Color maps for that DONT use transparency (Generally “Normal quality/most”, Suits etc):
DXT5 for DX10
BC7 (modes 0 to 3) for DX11, or BC6f for “HDR” colours

Color maps for that DO use transparency (Generally “Low quality/small”, Like a Biome Map etc):
DXT1
BC7 (Modes 4 to 7) for DX11

Color maps for oceanic planets (Laythe, Kerbin, Eve, etc):
DXT5_BC3 for DX10
BC7 (modes 0 to 3) for DX11 with TRANSPARENCY OFF

Color maps for non-oceanic planets (Tylo, Moho, Dres, etc):
DXT1_BC1 for “Low” or DXT5 for “Normal”
If DX11 BC7 (Modes 4 to 7), with TRANSPARENCY ON

This is because, for oceanic planets, the transparency of the 'land pixels' determines the shininess.
The 'ocean pixels' should not have transparency.

- Biome maps:
DXT1_BC1

-Normal maps (blue format):
DXT5_nm

- Normal maps (Kittopia export):
DXT5

- Height maps: **just plain uncompressed .dds files**, but set the format to:
L8

Note:

DXT5, DXT5_nm and DXT1 under the 'Compression' drop-down menu,
L8 is found under the 'Format' drop-down menu.

……..Step By Step……..

1. Install ImageMagick
Get the latest version here: ImageMagick for Windows

2. Download the DirectXTex tools
Get the latest version here: Microsoft DirectXTex releases on GitHub
You have to download »texconv.exe« and »texdiag.exe«.
***Note: This IS DIFFERENT than the TexconvGUI Program, DO NOT MIX THEIR INTERNAL FILES!**

3. (Optional) Install the Cmder command-line tool
This step is optional because you can just use the Windows command shell (cmd). **Cmder is for the power users** (installation is manual, Cmder provides some more/better features).
Get the latest version here: Cmder releases on GitHub
Follow the installation instructions here.

5. Prepare folders and tools
Choose a directory where you want to do the texture conversions and edits. Create the following (sub-) directories there:

File Structure:

LETS MAKE a FOLDER: as "New Folder" on the root of C: (or c:\)

C:\"WorkBin"

Then inside of that make

NOTE: WorkBin shown as an "aid" don't make moee "WorkBin" folders)

WorkBin\dds-source (← this folder is for "unknown" dds files, see step 7 & example commands)

WorkBin dds-source\dxt1

WorkBin\dds-source\dxt5

WorkBin\png-dxt1

WorkBin\png-dxt5

WorkBin\output

WorkBin\OutPut\DXT1_BC1_Colour_4_NO_Transp

WorkBin\OutPut\DXT1_L8_Height

WorkBin\OutPut\DXT5_BC3_Colour_4_YES_Transp

WorkBin\OutPut\DXT5_nm_Normal

WorkBin\OutPut\BC6h

WorkBin\OutPut\BC7_4_YES_Transp

WorkBin\OutPut\BC7_4_NO_Transp

WorkBin\Input\To_L8

WorkBin\Input\To_Color_Low

WorkBin\Input\To_Color_Normal

WorkBin\Input\To_Color_DX10_High

WorkBin\Input\To_Color_DX10_HDR

WorkBin\Input\To_DXT1_L8

Now copy the DirectXTex tools »texconv.exe« and »texdiag.exe« into the "root" of the directory, OR in laymens terms: to **C:\Users\"Your PC's Name"\Documents\"WorkBin",**

(Info) You may chose your own directory names, but then you have to modify the commands below to suit this.

6. Open a command shell in the root folder
Open a new Windows command shell (cmd) in the root folder by press and hold shift key and rightclick somewhere in a empty area. From the menu select »Open command window here«.

(Optional) If you use Cmder and have installed it properly, you can do a rightclick somewhere in the folder and select »Cmder here«.

7. (OPTIONAL) Open a KSP mods folder, find all the dds files and sort them according to their type, COPY all to, THE EMPTY, "dds-source" folder in the "WorkBin".

(Info) Please exclude any cubemaps, heightmaps or normalmaps from the source files as the don't need to be modified.

OPTIONAL, BUT BACK UP, then copy all DDS files KSP install to one of your source image files in the »source« folder. MAKE SURE YOU BACKED UP, Run the following command to gather the format information:

Code:

```
texdiag info dds-source\*.dds > output.txt && START output.txt
```

This command creates an »output.txt« file in the root directory which includes all basic information of the DDS files in the »source« directory. The »output.txt« will be directly opened with the Editor (it's the Windows default, of course you may use another program). You can avoid this by only using the first part of this command (until »&&«).
Screen the »output.txt« for BC1 (a.k.a. DXT1) and BC3 (a.k.a. DXT5). Move the files into the respective sub-directory in your source directory (DXT1 to »dxt1« and »DXT5 to »dxt5«, and so for other formats, *if* you have created more commands).

(Info) Normally the files in DXT1 format are the minority, so moving these first might be the fastest way to sort the files.

8. Convert, modify and convert back with ImageMagick and texconv
(Info) ImageMagick gives the best lossless results for PNG conversion, so this is the preferred method. Texconv can do the conversion too, but the results are compressed too much which will result in even worse DDS later.

Therefore I don't include the alternative commands here, but if you are interested have a look into the DirectXTex Wiki.

Run the following command:

NOTE: Do not run on L8 or NM type dds files!

Example commands:

For Just plain "non-compressed" DDS:

Code:

```
mogrify -format png -define png:compression-level=0 -define png:compression-filter=5 -define png:compression-strategy=2 -depth 8 -channel RGB +level 7.8%,78.4% -path png-dxt1\ dds-source\dxt1\*.dds >> log.txt && mogrify -format png -define png:compression-level=0 -define png:compression-filter=5 -define png:compression-strategy=2 -depth 8 -channel RGB +level 7.8%,78.4% -path png-dxt5\ dds-source\dxt5\*.dds >> log.txt && texconv -nologo -timing -y -f DXT1 -o output png-dxt1\*.png >> log.txt && texconv -timing -nologo -y -f DXT5 -o output png-dxt5\*.png >> log.txt
```

This command will convert the DDS files to PNG based on their source folders (i.e. format) and modify the color levels at the same time. The last part of the command then converts the modified PNG back to DDS and save them in the »output« directory. During all steps the console output gets written into a log.txt file (that's much easier than scrolling the console)

Please note: In case you only have DXT1 or DXT5 textures the above command will fail. You need to use the following separated commands instead:

For DXT1:

Code:

```
mogrify -format png -define png:compression-level=0 -define png:compression-filter=5 -define png:compression-strategy=2 -depth 8 -channel RGB +level 7.8%,86.3% -path png-dxt1\ dds-source\dxt1\*.dds >> %FileDateTime%_log.txt && texconv -nologo -timing -y -f DXT1 -o output png-dxt1\*.png >> %FileDateTime%_log.txt
```

For DXT5:

Code:

```
mogrify -format png -define png:compression-level=0 -define png:compression-filter=5 -define png:compression-strategy=2 -depth 8 -channel RGB +level 7.8%,86.3% -path png-dxt5\ dds-source\dxt5\*.dds >> %FileDateTime%_log.txt && texconv -nologo -timing -y -f DXT5 -o output png-dxt5\*.png >> %FileDateTime%_log.txt
```

Now you are done

End of Tutorial 1, Start of Tutorial 2

Tutorial for Photoshop

(Info) This tutorial uses the macro-capabilities of Photoshop. Follow these simple steps to configure your macro to batch-edit DDS files. You have to record one macro for DXT1 files and one for DXT5. You can follow the steps 4 to 6 from the tutorial above to sort your files.

1. Open one of the files to edit in Photoshop, go to Window-Actions, and you have actions tab near the history tab.
2. Press "Create new action" (sheet icon), name it appropriately
3. Press record. Now every action you make is recorded. But it can be then removed and re-recorded if needed.
4. Apply color levels , and save it in the needed dds format*. It will record the dds saving settings, so you can make 2 sets of actions - for dxt1 and dxt5 for example.
5. Once you've saved, press stop and your action is ready to use.
6. Go to File > Automate > Batch, choose your action, choose folder and it'll convert your files.

*But make sure you revert the changes to the file you've opened for recording actions, and save it before going batch process, or make sure it is in another folder. Otherwise it will open that file again, and will apply levels again.

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Please note: DDS is a compressed format. Open a DDS, edit it and save it again will unfortunately result in a loss of quality. Make sure to not do more than maybe one or too editing steps. Better solution is to go with original files (e.g. with skins or textures in their PSD format).