1 Installing TOPO

1.1 System Requirements

TOPO is written in the IDL scientific programming language, and will run on any platform supported by IDL. While most TOPO routines are intended for use in your own IDL programs, the GUI-based programs included with TOPO – TOPO_prof, TOPO_psd, TOPO_surf, and TOPO*Multiplot – require little or no IDL expertise.

There are two ways to run TOPO: (1) using a licensed copy of IDL, and (2) using the free XOP package, which includes an embedded, licensed copy of IDL.

1.1.1 Using TOPO as an IDL application

TOPO can be run using IDL version 6.3 or higher. IDL is available for purchase from Exelis Visual Information Solutions:

http://www.exelisvis.com/ProductsServices/IDL.aspx

NOTE: The full version of IDL is required to run TOPO.

TOPO will NOT run using the free IDL Virtual Machine.

1.1.2 Using TOPO as an XOP extension

TOPO can be run as an 'extension' to the free XOP software package, available at ESRF:

http://www.esrf.eu/Instrumentation/software/data-analysis/xop2.3

If you will use TOPO as an XOP extension, you can run the GUI-based TOPO programs to analyze surface topography data. You will not be able to use your own IDL programs containing TOPO routines, however.

Reflective
X-rayOptics

7 October 2013

1.2   Installing TOPO as an IDL application

If you will use TOPO as an XOP extension, then you can skip this section and proceed to §1.3.

Once you have IDL installed and running on your computer, follow these steps to install and run TOPO:

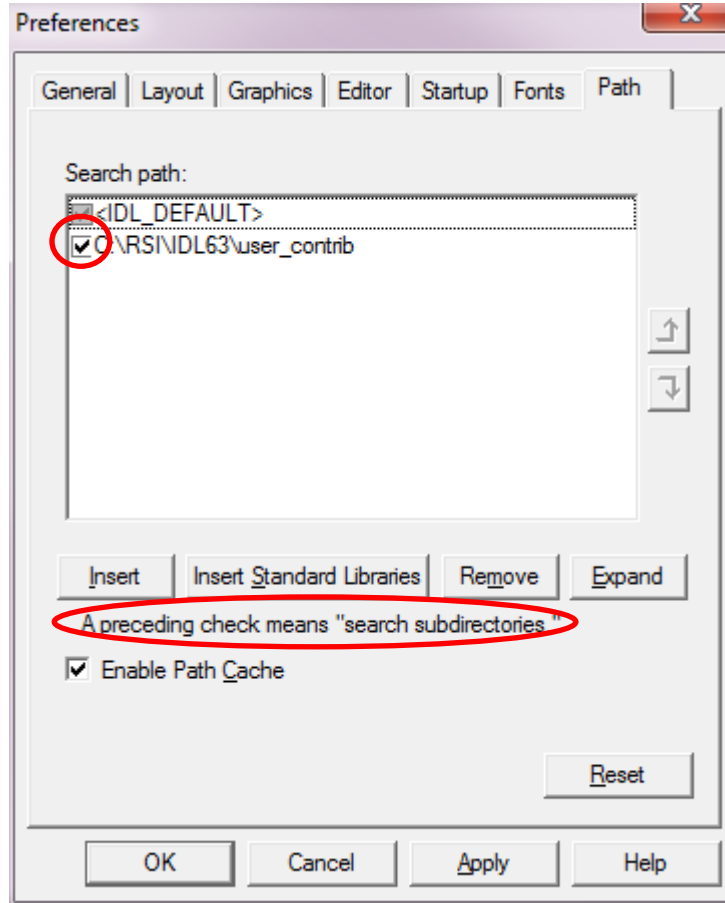1. Create a directory (folder) called `user_contrib` in the main IDL installation directory.

    NOTE: You can install TOPO in a different directory if you so choose. But if you do not install TOPO in the `user_contrib` directory as described here, then you **must** edit the `topo_cfg.pro` configuration file to specify the actual installation location. See §1.4.1 for further details.

2. Download the TOPO installation file `topo_xxx.tar.gz` from http://www.rxollc.com/idl/ (xxx=version number; for example, `topo_2.2.tar.gz`)

3. Unpack the `topo_xxx.tar.gz` file containing the `topo` installation directory.
    - For Windows: use a program like Winzip to open `topo_xxx.tar.gz`
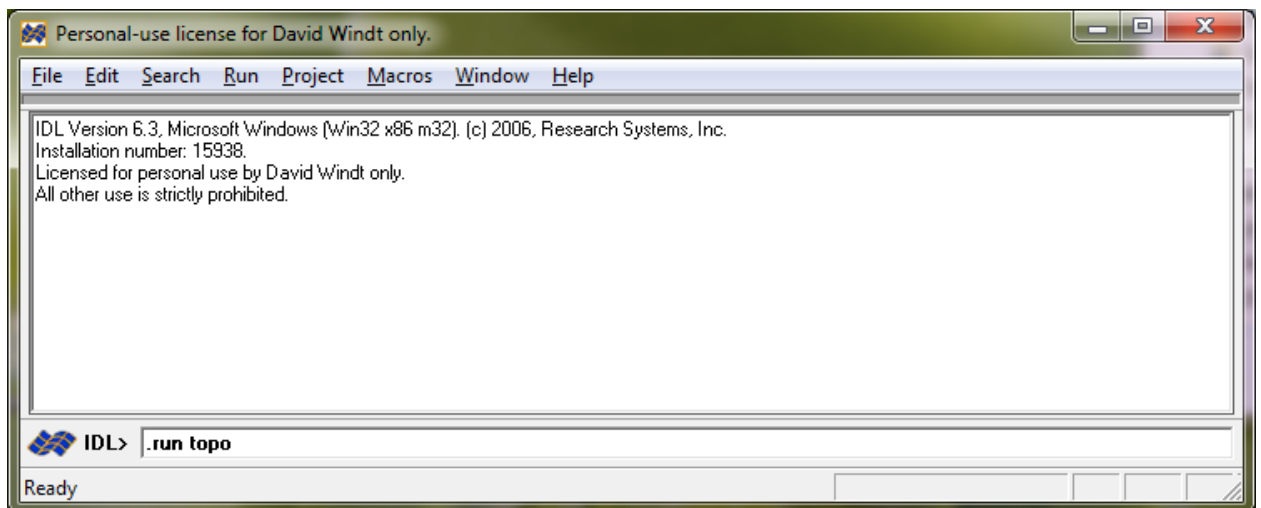   - For Linux/Mac OS X/Solaris: use the gunzip command:
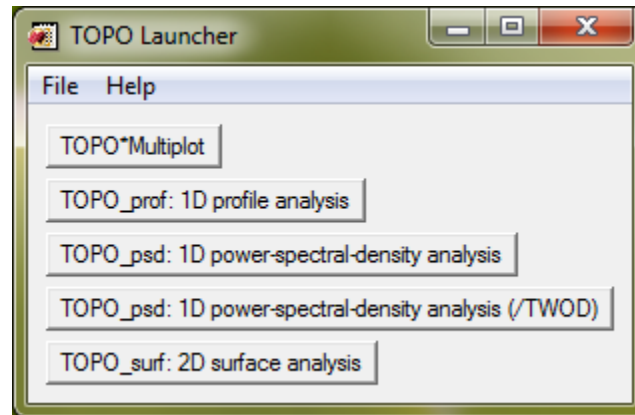 $ `gunzip topo_xxx.tar.gz`
      followed by the tar command:
      $ `tar –xvf topo_xxx.tar`

4. Move the `TOPO` installation directory to the `user_contrib` directory created in step 1. (i.e., to …`/idl/user_contrib/topo`)

5. Start IDL and add the new `user_contrib` directory just created in step 1 to your IDL search path. Consult the IDL documentation for help configuring the IDL_PATH environment variable. If setting IDL_PATH manually, be sure to include a "+" sign so that the subdirectories under `user_contrib` will be included (e.g., IDL_PATH=+/usr/local/rsi/idl/user_contrib:…) If you're using IDL's Preferences GUI to set the search path, be sure to check the 'search subdirectories' box:

6. After your IDL search path has been redefined in step 5, type `.run topo` at the IDL prompt to start TOPO:

7. The TOPO splash-screen will appear. Click 'OK' to start TOPO Launcher and load the TOPO library of IDL routines. From TOPO Launcher you can run the GUI programs TOPO*Multiplot, TOPO_prof, TOPO_psd, and TOPO_surf:

8. You're up and running!

Now please read the rest of TOPO.pdf so that you get the most out of TOPO!

Also, check out the IMD & TOPO Google group (https://groups.google.com/forum/#!forum/imd_topo) for discussion, and announcements of future releases.

1.3   Installing TOPO as an XOP extension

If you will NOT use TOPO as an XOP extension, then you can skip this section and proceed to §1.4.

Once you have XOP installed and running on your computer, follow these steps to install and run TOPO:

1. Download the TOPO installation file `topo_xxx.tar.gz` from http://www.rxollc.com/idl/
   (`xxx`=version number; for example, `topo_2.2.tar.gz`)
2. Unpack the `topo_xxx.tar.gz` file containing the `topo` installation directory.
   - For Windows: use a program like Winzip to open `topo_xxx.tar.gz`
   - For Linux/Mac OS X/Solaris: use the gunzip command:
     `$ gunzip topo_xxx.tar.gz`
     followed by the tar command:
     `$ tar –xvf topo_xxx.tar`
3. Move the `topo` installation directory to the `extensions` directory in the XOP installation
   directory (e.g., to `…/xop2.3/extensions/topo`).
4. *For Windows only:*
   - copy the file `C:\xop2.3\extensions\topo\extras\topo4xop.bat`
         to `C:\xop2.3\topo4xop.bat`
     and
   - copy the file `C:\xop2.3\extensions\topo\extras\topo4xop.vbs`
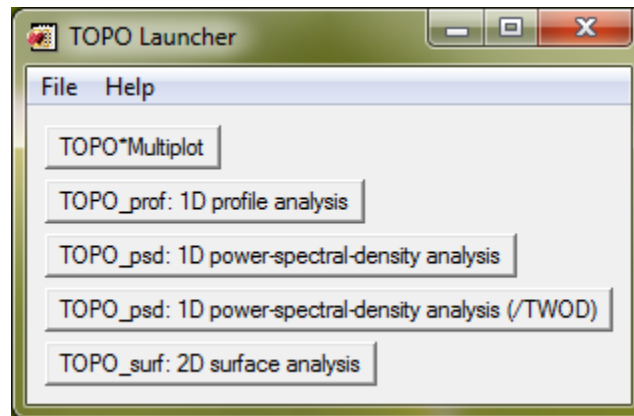   to `C:\xop2.3\topo4xop.vbs`

   *The name of the XOP installation directory depends on the version of XOP that you have
   installed, and on where you have installed it on your computer. For this step we've assumed that
   XOP V2.3 is installed in the default location* `C:\xop2.3`*.   However, if you have a different
   version of XOP, or a different installation location, please substitute the correct name and path
   for your XOP installation directory above.*

   Note*: if you don't use the default installation location (*`C:\xop2.3`*), you MUST edit*
   `topo4xop.bat` *and specify the correct path to* `xop.bat`.

   *You might also want to make a shortcut on your Desktop to one or both of these files, so you can
   start TOPO by double-clicking that shortcut. Use* `topo4xop.vbs` *if it works on your system,
   otherwise use* `topop4xop.bat.`
5. Start TOPO:
   - For Windows: Double-click on `topo4xop.vbs` (or `topo4xop.bat` if necessary.) Or,
     start XOP and then use the XOP➔Load extension… menu option to select topo4xop.
   - For Linux/Mac OS X/Solaris: At the command line, type: `xop topo4xop`

6. The TOPO splash-screen will appear. Click 'OK' to start TOPO Launcher. From TOPO Launcher you can run the GUI programs TOPO*Multiplot, TOPO_prof, TOPO_psd, and TOPO_surf:

7. You're up and running!

Now please read the rest of TOPO.pdf so that you get the most out of TOPO!

Also, check out the IMD & TOPO Google group (https://groups.google.com/forum/#!forum/imd_topo) for discussion, and announcements of future releases.

1.4   Customizing the TOPO installation: `topo_cfg.pro`

1.4.1   Non-standard installation location

If you will use TOPO with a licensed copy of IDL, and you choose not to install the `TOPO` installation directory in the default location, i.e., the `user_contrib` directory in the main IDL directory as described in §1.2, then you **must** edit the TOPO configuration file `topo_cfg.pro`, which is located in the `topo` installation directory you have selected: specifically, using any plain-text editor, change the value of the `topo_home` variable defined in this file so that it refers to the actual location where you've installed the `topo` directory on your computer.

EXAMPLE: You are using a linux system and you have installed topo in your home directory, e.g., `/users/joe/topo`.

Edit `topo_cfg.pro` and replace the line

`if (!version.os_family eq 'unix') then topo_home=!dir+'/user_contrib/topo/'`

with

`if (!version.os_family eq 'unix') then topo_home='/users/joe/topo/'`

1.4.2   Other customizable settings

There are other operating-system- and site-specific settings that you can modify in the `topo_cfg.pro` configuration file, specifically those that control the fonts and special characters used by the TOPO graphical user interfaces (GUI). Please follow the instructions contained within the `topo_cfg.pro` file to make such modifications.

If you are using TOPO on a unix platform, you can also use the `Xdefaults` configuration file included in the `topo/extras` directory to set some TOPO-specific X-windows preferences. One method to do this is to copy the contents of `topo/extras/Xdefaults` into your personal .Xdefaults file, or into the IDL Xdefaults file, `!dir/resource/X11/lib/X11/app-defaults/Idl`, where `!dir` is the IDL installation directory on your computer.

1.5   Common Installation Problems and Solutions

Problem: IDL can't find TOPO:

```
IDL> .run topo
Error opening file. File: TOPO
```

Solution: You must add the TOPO installation directory to your IDL search path, as described in §1.2.

Problem: The TOPO windows don't look right, and/or don't look much like the examples in this document.

Solution: The fonts used by TOPO, which are specified in the `topo_cfg.pro` configuration file, might not be available on your computer. Edit the `topo_cfg.pro` file, as described in §1.4, and specify valid fonts that are actually installed on your computer. [i]

Problem: Special characters, such as 'Å', 'µ', 'δ', etc., don't display correctly in the TOPO windows.

Solution: The special character codes for your particular installation, which are specified in the `topo_cfg.pro` configuration file, must be the correct codes for the fonts used by TOPO, which are also specified in that file. Edit the `topo_cfg.pro` file, as described in §1.4, and specify valid special character codes for the fonts that you have specified. [i]

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[i] If your operating system is not specifically listed in the `topo_cfg.pro` configuration file, you'll need to manually add the necessary entries for optical constants and atomic scattering factors directories, fonts, etc, using as a template the lines in that file that contain "YOUR OS": replace "YOUR OS" with the value of the IDL system variable !version.os as defined on your computer.