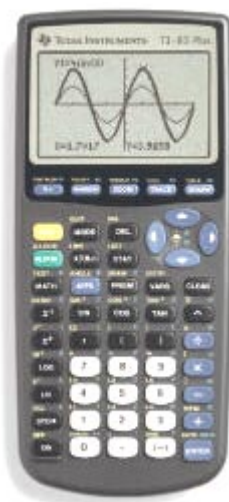# Graph-Link 83: The Brief Course

Set up Graph-Link

- Connect your *Graph-Link* cable to the computer and to the TI-83. You might need to use the 25-pin to 9-pin adapter. Look for a connection on the back of the computer that the cable will fit.
- Install the Graph-Link software from a floppy diskette or get the Graph-Link software from http://www.ti.com/calc/docs/link.htm. It comes in an EXE (setup) file. Download it to a temporary folder (**c:\temp** or **c:\windows\temp**). Run this SETUP83.EXE file to install the Graph-Link software for the TI-83.
- Turn on the **TI-83** and leave it on the HOME screen.
- Run the *Graph-Link* software and set the COM port to which the cable is connected (see the **Link** menu). It will probably be COM2 or COM1. To test your connection, try the **Link/Receive** menu item until it shows the TI-83's contents.

> *Tip*: **Know where your files are!** In a lab setting, it's a good idea to put your files on a floppy (3.5") diskette. If you have access to the hard drive, you should make a folder in "*My Documents*" called "*TI-83 Files*" and put all your TI-83 files there.

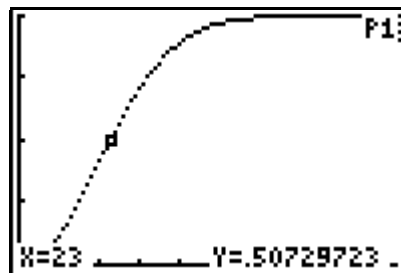> *Troubleshooting*: If you get a "Transmission Error":
> - Is the *Graph-Link* cable *connected* **securely** at both ends?
> - Is the TI-83 ON and on the **HOME** screen?
> - Is the correct COM port selected in the **Link** menu?

Back up your TI-83

- Make sure the *Graph-Link* cable is **plugged** into the TI-83 and the TI-83 is **ON** and on the HOME screen
- Run the *Graph-Link* software on the computer.
- On the **Link** menu, choose **Get Backup**.
- The default filename is **backup.83b**. You can change the filename but *do not change the extension*. Save it in **c:\My Documents\TI-83 Files** or on your diskette (**a:**).

Paste TI-83 screen shots into your word processor

1. Run *Graph-Link* and your word processor *at the same time*.
2. Display *any* desired screen on the TI-83.
3. In *Graph-Link*, select **Link/Get Screen.**
4. In the **Get Screen** dialog box, click on the **Get Screen** button. The screen shot appears.
5. Click the **'Clipboard'** button to send it to the *clipboard*.
6. Switch to the word processor.
7. Place the cursor at the point where you want the picture to go.
8. Select **Edit/Paste** or press **Ctrl-V**.
9. You can customize the placement, size, and text-wrap of the image, but the methods depend on the word processor.

Get a program from the TI-83

1. In *Graph-Link*, select **Link/Receive**
2. The computer displays all items in the TI-83 that can be uploaded to the computer.
3. Select a filename on the left, click the 'Add' button in the middle. You may select multiple files.
4. The 'Group' checkbox at the bottom will cause all the files you select to be placed into one 'Group file' (*.83G) on the computer.
5. Click the **OK** button.
6. The computer will display the upload progress.
7. Wait for "** Completed **" to appear on the computer.
8. The directory (folder) in which the file(s) will be saved is indicated at the top. To save there, click the 'Save' button. To change the directory, click the 'Directory' button.
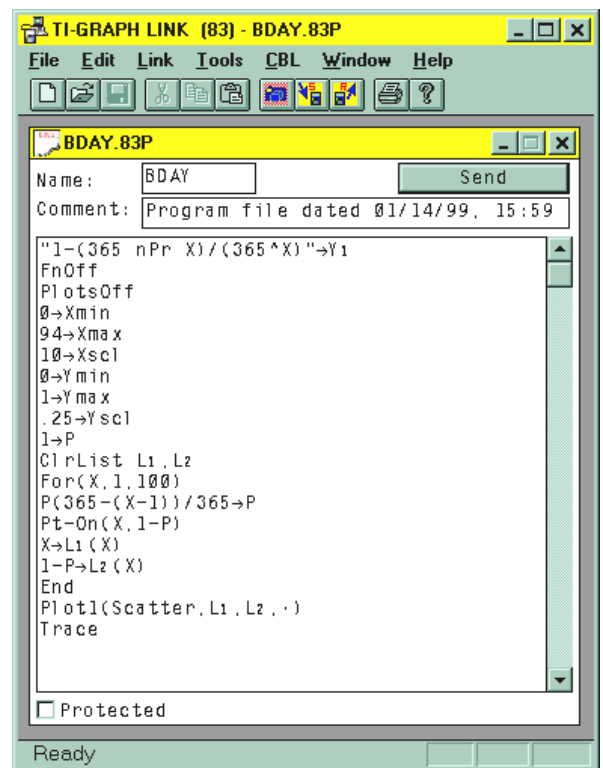
Send a program to the TI-83

1. In *Graph-Link*, select **Link/Send**
2. Navigate to the folder that contains the program(s) you want to send to the TI-83: use the 'Directories' list.
3. Select the file from the 'Filenames' list on the left, then click the **ADD** button. You may select multiple files.
4. Click the **OK** button.
5. The computer and the TI-83 will display the download progress.
6. Wait for "DONE" to appear on the TI-83 and "** Completed **" to appear on the computer.
7. Press the PRGM key on the TI-83 to see that programs were downloaded.
8. If you see the "Duplicate name" menu on the TI-83, choose one of the options: Overwrite, Omit, Quit, or Rename.

Edit a program

Graph-Link has a built-in *program editor* and shortcuts to the programming commands in the TI-83. You can edit and send a program quickly to the TI-83 right from the program editor. You can type in programs 'by hand' or select programming statements from a menu.

1. You do not need the *Graph-Link* cable or the TI-83 connected to *edit* programs.
2. Run *Graph-Link*.
3. If there is no program window, select **File/New** or **File/Open**.
4. The top of the program window displays the current program name and the comment. The program name can be different from the computer filename, and the comment is stored in the computer file, but not sent to the TI-83.
5. Type a program into the program window: (do not type the colons (*Where do you get that 'square root' symbol?*)
6. The **Window/Function list** or **Window/TI-83 Keypad** come in handy for entering symbols that do not appear on the computer keyboard, like ➔.
7. Click the **SEND** button in the program window to 'quick send' this program to the TI-83 (if it is connected and ready).
8. If you want the program to be '**un-editable**' in the TI-83, check the 'Protected' check box before sending.
9. Press the PRGM on the TI-83 to verify that the program is in the TI-83.
10. Run the program in the TI-83, not on the computer.
11. If there is an error, do not fix it in the TI-83: fix it on the computer and re-send it.
12. You can save this program on the computer (in an "83P" file). You can open other programs and have multiple program windows open simultaneously for copying chunks of code.

The Tools Menu

- **Group** and **Ungroup** are used with Group files (*.83G). If you have a group file that contains programs, you will ungroup them so that you can edit them.
- You can send group files directly to the TI-83 without ungrouping them. The reason they are in a group file is because they belong together for some reason!
- **UUEncode** and **UUDecode** are used for converting binary files into text files so that they can be sent as email. This is no longer necessary, so ignore these features!

- **Convert TI-82** programs works about 90%. You still have to touch up the code.
- **Import** and **Export** are useful for data, not for programs. You can import/export tab-delimited ASCII files for use with spreadsheets.
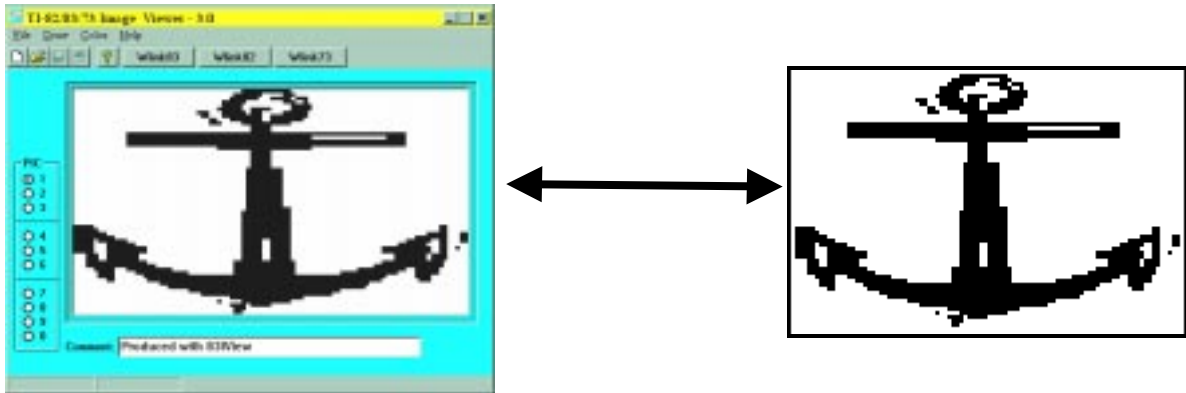
The CBL menu

is handy for entering **CBL** programming statements into a program that will control the **CBL**. This menu is available only when a program window is open.

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Fun with Image files

Image files are TI-83 *PIC files* uploaded to the computer, not 'Screen Shots'. Using 83IVIEW for Windows 95, you can open, edit, and print these "Image" files on your computer.

1) Get IVIEW:
   a) On the Internet, go to http://www.bergen.org/~tejohhan/iview.html
   b) Download a "Setup package" for the TI-83 into **c:\temp**. This is an EXE file.
   c) Run SETUP83IVIEW.EXE. This will install the 83IVIEW program on your computer.
2) Run IVIEW and Graph-Link simultaneously.
3) On your TI-83:
   a) Get a **graphic** screen that you like.
   b) Save the picture in a **PIC**ture variable in the TI-83:
      Use Draw(2nd PRGM) STO/**StorePic**, then VARS, Picture…, choose one, then press ENTER.
4) Use *Graph-Link* to get the **PIC**ture from the TI-83 to the computer:
      Get the picture file from the TI-83 and save it. The file extension will be "83I"
5) In **IVIEW**:
      Open the file, edit it and save it (see *Using 83IVIEW* below).
6) Use *Graph-Link* to send it back to the TI-83.
7) Back on the TI-83: use DRAW/STO/**RecallPic** *<picvar>* to display an image. It helps to first clear the graph screen and turn **off** all functions, plots, and the axes so they don't mess up the picture.

Using IVIEW

Click on the picture area and drag the mouse to draw 'freehand'. Right-click the picture to bring up the Tools menu (Draw/Tools: Pen, Line, Box, Bar, Circle, Ellipse). Tools that begin with "Wh" will draw using the background color. The picture can be displayed using any two colors (Pixels and Background). Choose the colors using the Color menu. The Draw menu also contains Flip/Vertical and Flip/Horizontal. Clear the screen using Draw/ClrDraw or by clicking the 'New' button.

The image can be saved as either an "??**I**" (calculator image) file or as a **BMP** file. When it is saved as an "??**I**" file, the color information is not saved. Use File/Page Setup to determine the positioning of the image on the page and to print in color.

The "Wlink83" button will run or switch to *Graph-Link 83*. The first time you click this button, you will have to locate the file WLINK83.EXE on your hard drive. If you installed the software to its default location, it will be in c:\winlink.

83IVIEW works with **83I**, **82I**, and **73I** files and it works with image files from the **TI-83 Plus**. The **Pic Vars** option buttons on the left are for establishing the PIC variable that the image will be downloaded into in the calculator. Use only the PIC variables that are allowed on the calculator you are writing for: the TI-83 uses PIC0 through PIC9.

IVIEW can **import** image files in WMF, BMP, ICO, GIF, or JPG format. It's a good idea to prepare the image using another picture editing program. For the TI-83, images should be 96x63 pixels and should be 2-color (black and white). Use File/Import to select the file to convert. It appears in the top left corner of the window and a confirmation dialog waits for your response. Images smaller than the screen size will be centered in the screen. Larger images will be cropped to the upper-left 96x63 pixels.

*The **IVIEW** programs are written by John Hanna (tejohhan@bergen.org).*

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