

## Appendix A

### Programming the PIC10F Microcontrollers

This appendix covers the following device programmers:

- The PICSTART Plus Device Programmer
- The PICKit 1 Flash Starter Kit Programmer
- The Baseline Flash Programmer (BFMP)
- And the PIC10F2XX Universal Programming Adapter (\*)

#### The PICSTART Plus device programmer

The PICSTART Plus programmer is the top of the line work-horse programmer and will handle almost all of the PIC microprocessor chips currently on the market without special adapter sockets, except for the PIC10F 23SOT-6 parts. The PIC10F family comes in both a PDIP-8 package and a 23SOT-6 package. Figure 1 below shows how to handle these two packages. The 23SOT-6 package soldered to a 'converter board' can be inserted into the 40-pin programming socket with the converter board pin-1 matching the programming socket pin-1. The PDIP-8 package is inserted into the 40-pin programming socket with the PDIP-8 pin-1 matching the programming socket pin-9. A special PIC10F2XX Universal Programming Adapter is required to handle the tiny 23SOT-6 package, as shown below:

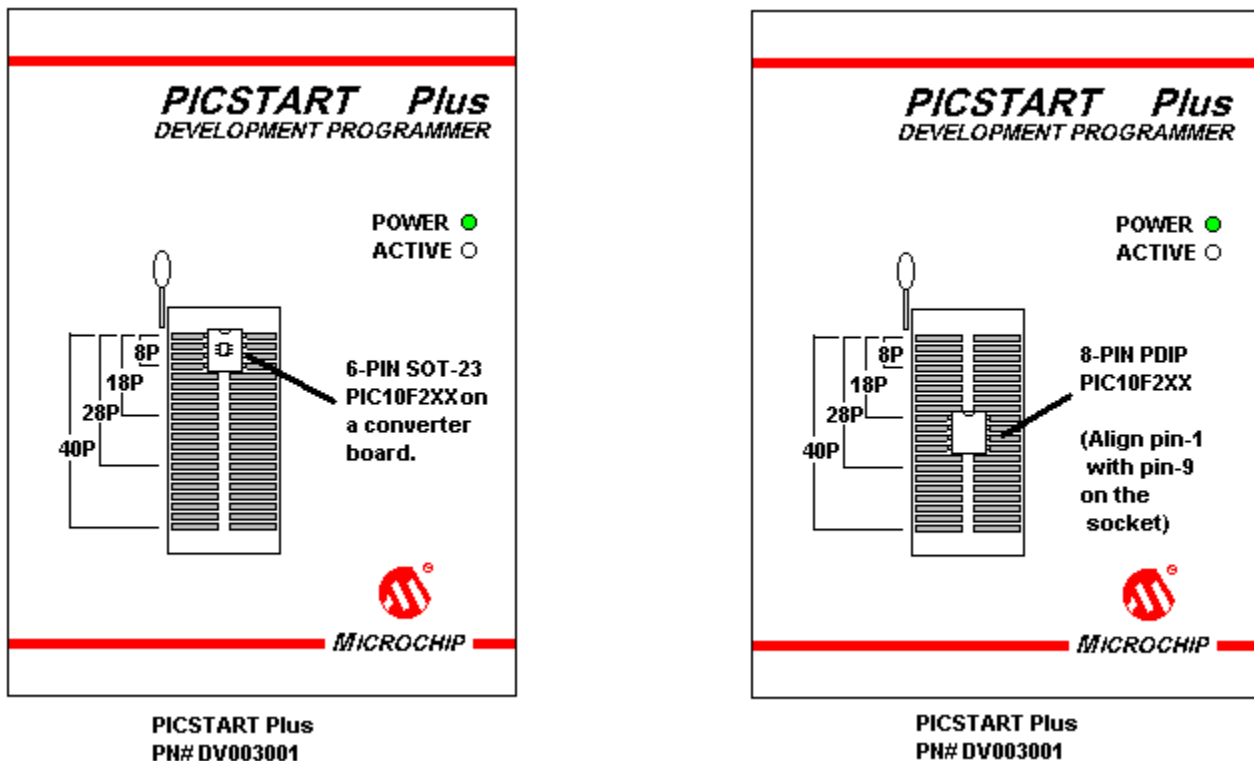


Figure 1 – Illustrates using the PIC10F 23SOT package on a 'converter board' and using the PDIP-8 package.

\*Note: The names PICKSTART Plus, PICKit 1 Flash Starter Kit, Baseline Flash Programmer (BFMP) and PIC10F2XX Universal Programming Adapter are the registered trademarks, copyrights or other property of Microchip Technology.

The PICSTART Plus device programmer (Continued)

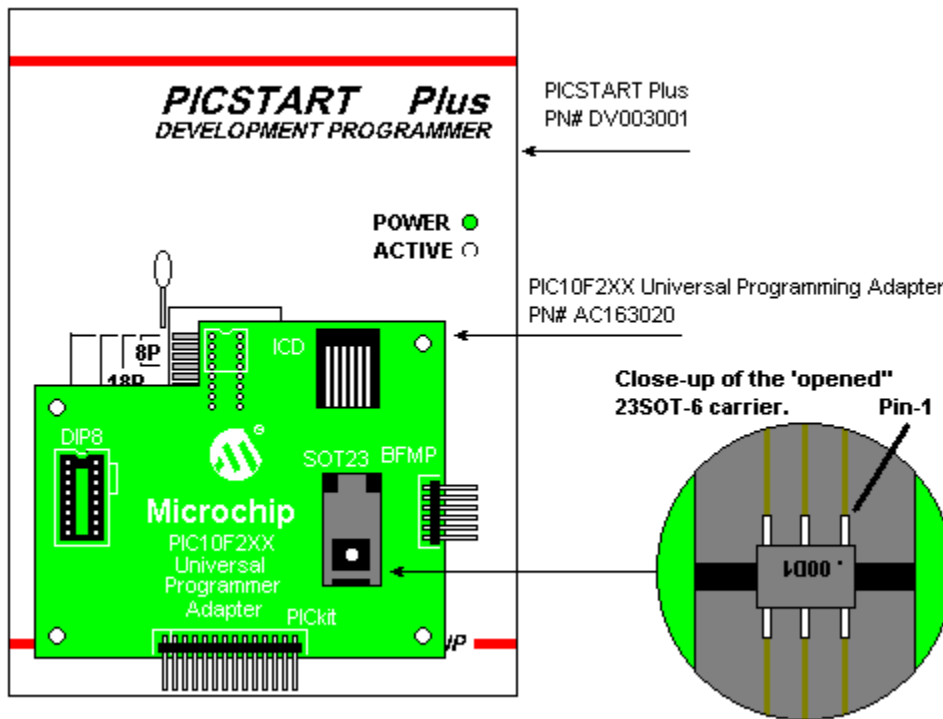


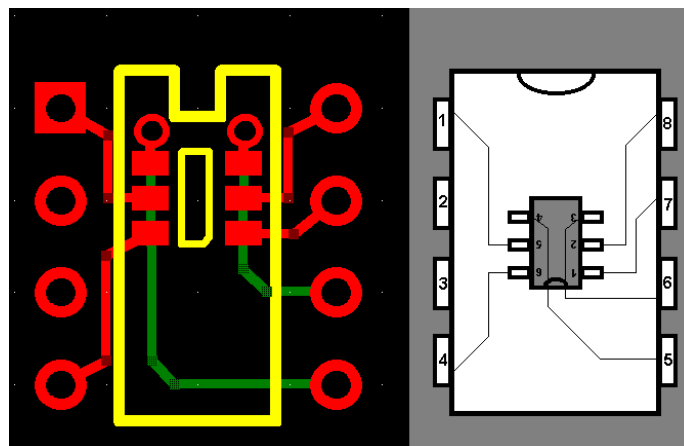
Figure 2 – Illustrates how to use the PIC10F2XX Universal Programming Adapter with the tiny 23SOT-6 package.

The PICSTART Plus programmer is available from Microchip Technology for \$199.00 USD at the following link:  
<http://buy.Microchip.com/ProductSearch.aspx?Keywords=DV003001>

If you have an older PICSTART Plus, you may need the firmware upgrade PN# UK003010. You can buy it at:  
<http://buy.Microchip.com/ProductSearch.aspx?Keywords=UK003010>

The PIC10F2XX Universal Programming Adapter is available from Microchip Technology for \$36.00 USD:  
<http://buy.Microchip.com/ProductSearch.aspx?Keywords=AC163020>

The PIC10F2XX Universal Programming Adapter may be used with other device programmers to enable them to use both the PIC10F PDIP-8 package and the PIC10F 23SOT-6 package. It cannot be used with the PIC10F converter board, shown as PCB artwork and as a schematic below:



## Using the Microchip MPLab IDE v7.00 to Control the PICKSTART Plus

- Connect the PICSTART Plus to the serial port on your PC.
- Connect a [12VDC@1Amp](#) wall transformer to the PICSTART Plus.
- Insert the PIC10F into the PICSTART Plus as shown above.
- Start MPLab IDE V7.0 or higher. This powerful free software package is a totally integrated design environment and is available at:  
[http://www.microchip.com/stellent/idcplg?IdcService=SS\\_GET\\_PAGE&nodeId=1406&dDocName=en019469](http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en019469)
- Open the project where you assembled your PIC10F code, if it is not already open. It will have a project name similar to "C:\PIC10F200.mcp."
- Left-click Programmer/Select Programmer/1. PICSTART Plus. The PICSTART Plus is selected and the window closes.
- The first time you use the PICSTART Plus device programmer, load the most recent PICSTART OS (operating System). Left-click Programmer/Download PICSTART Plus OS. A window opens and displays several 'psplsXXXXX.hex' programs. Left-click the program where XXXXX is the highest number (i.e.: The latest program, probably pspls43001.hex) then left-click 'Open'. Wait until the message 'Download Complete' is displayed, then continue. You should only need to do this the first time you use the PICSTART Plus device programmer.
- Again left-click Programmer/Enable Programmer. The window will close. Wait until the activity bar stops.
- Again left-click Programmer. Make sure the device is in the programming socket and that the socket locking-bar is up (i.e.: Toward you). The activity light on the PICSTART Plus will go out when the programming is done and the 'Configuration Memory' window will pop-up. Left-click on Yes.
- If the first-time programming effort fails, then left-click Programmer/Erase Flash Device. Then left-click Programmer/Blank Check All. A message will print 'Device is Blank'. Then again left-click Programmer/Program. If all is OK the message "Programming/Verification completed successfully" will print. Remove the device from the programming socket.

## Using the PICkit 1 Flash Starter Kit

The PICkit 1 Flash Starter Kit is a low-cost programmer for the PIC10F200/202/204/206, PIC12F508/509 and PIC16F54/57/505. There are various ways to handle the PIC10F packages. Figure 3 below illustrates how to program the PIC10F on a converter board. The PICkit 1 Flash Starter Kit is available from Microchip for \$36.00 USD at: <http://buy.Microchip.com/ProductSearch.aspx?Keywords=DV164101>

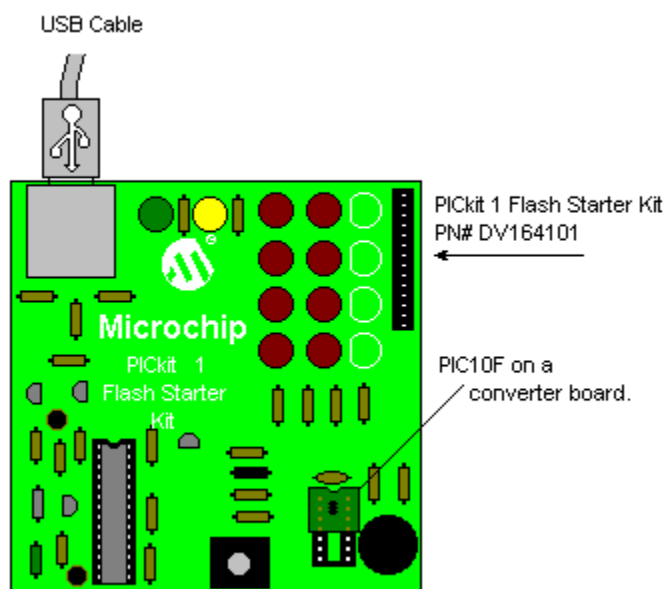


Figure 3 – Illustrating how to use the PICkit1 to program a PIC10F on a converter board.

### Using the PICkit 1 Flash Starter Kit (Continued)

The PICkit 1 Flash Starter Kit is also used with the PIC10F2XX Universal Programming Adapter as shown in figure 4 and figure 5 below:

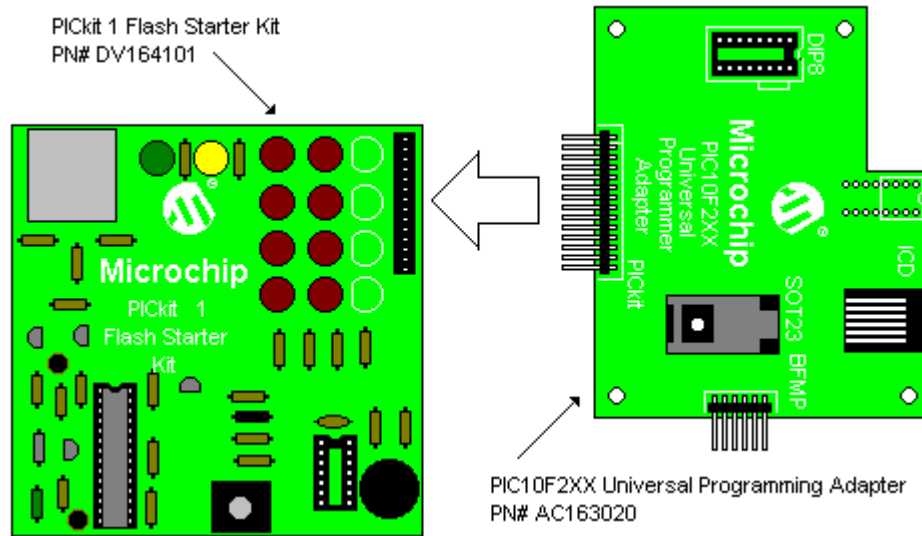


Figure 4 – Illustrating how to connect the PIC10F2XX Universal Programming Adapter to the 14-pin header on the PICkit 1.

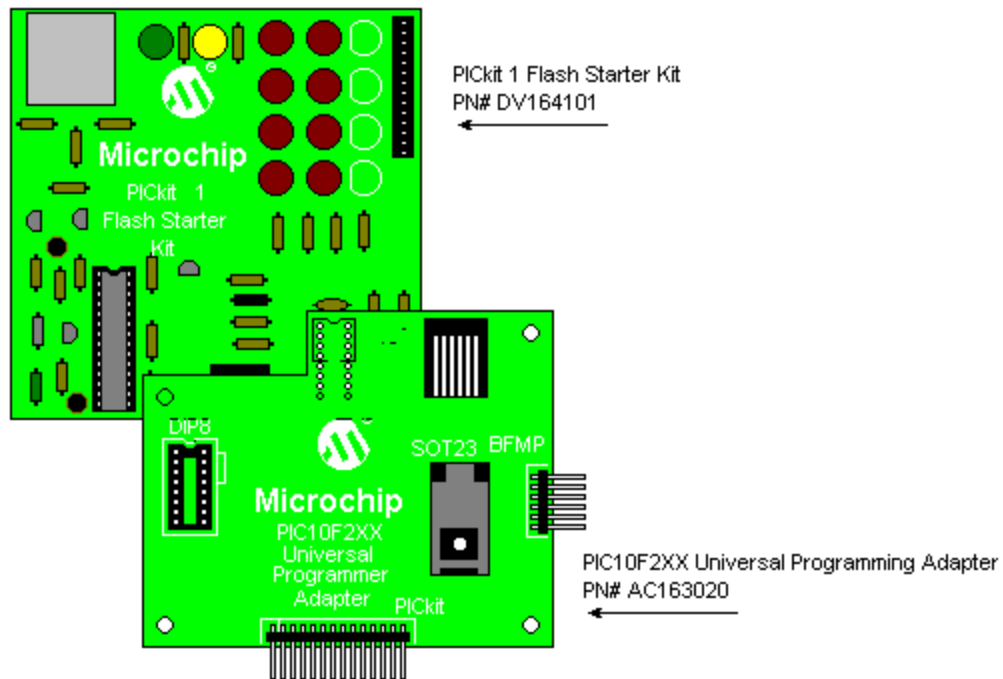


Figure 5 – Illustrating how to connect the PIC10F2XX Universal Programming Adapter to the 14-pin evaluation socket on the PICkit 1. Align pin-1 of the PICkit 14-pin socket with pin-1 of the adapter's 16-pin socket.

### Using the PICkit 1 Programming Software

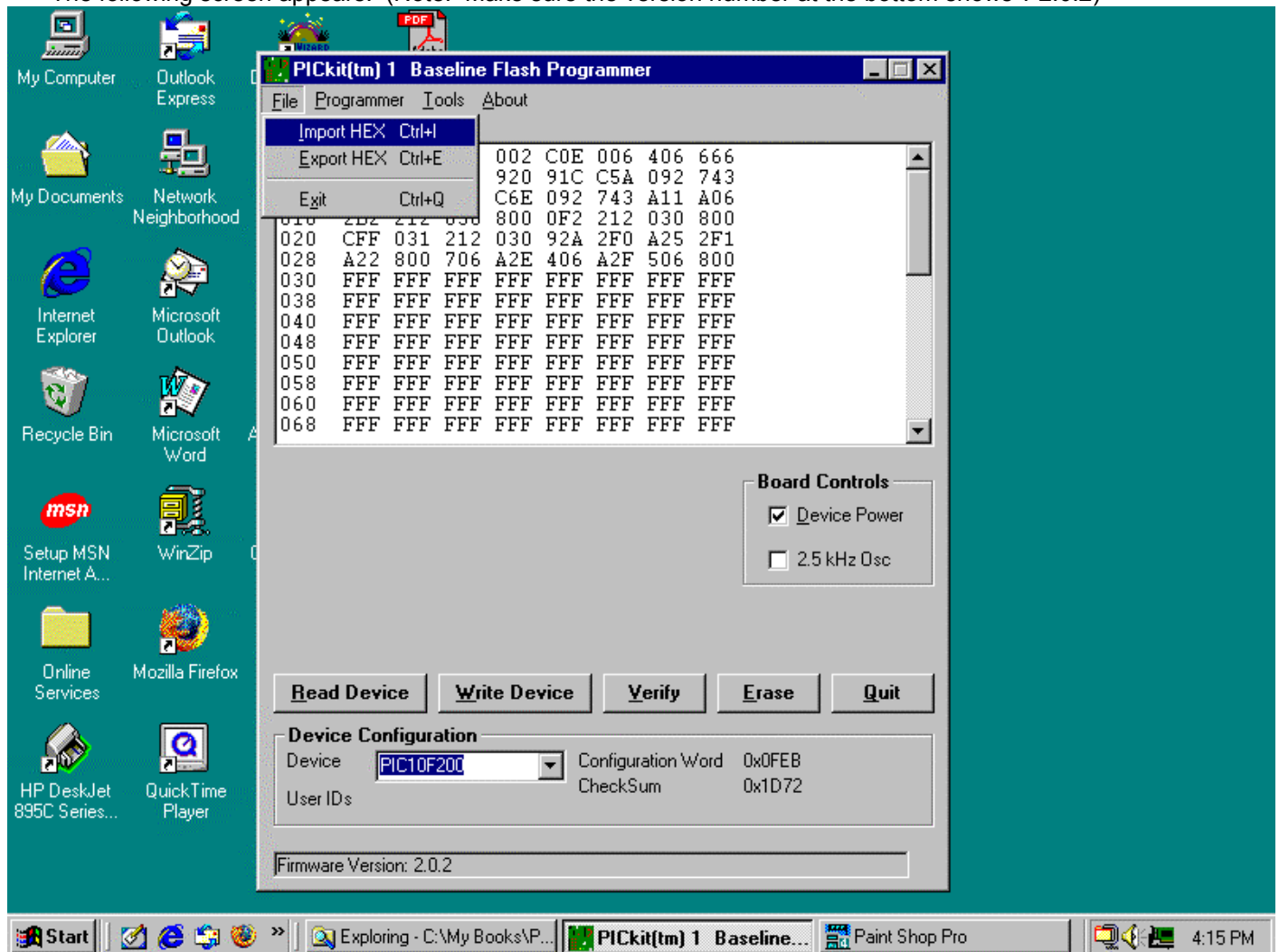
The PICkit 1 Flash Starter Kit comes with software. You need version 2.0.2 or later. If you have an older version of the PICkit 1, you may order the most recent software from Microchip Technology for \$5.00 USD at: <http://buy.Microchip.com/ProductSearch.aspx?Keywords=UK003010>

- Connect the PICkit 1 to the USB port on your PC, using the USB cable that came with the kit.
- Open



PICKit1 Baseline Flash.exe

- The following screen appears: (Note: Make sure the version number at the bottom shows v 2.0.2)



- Insert the device to be programmed into the socket of the adapter you are using.
- Left-click on the 'Device' window and select your device from the 'drop-down' list.
- Left-click on File/Import HEX as shown above.
- Go to your source code directory and select the .HEX file to burn into your device. If you have used the MPLab IDE to assemble your source code, a .HEX file of the same name will exist.
- Left-click on the 'Write Device' button. A progress bar will indicate the progress.
- The 'Firmware Version' window will turn green and indicate 'success'. Otherwise, it will turn red and indicate 'fail'.

### Using the Baseline Flash Programmer (BFMP)

The Baseline Flash Programmer (BFMP) is another inexpensive device programmer, available from Microchip Technology for \$36.00 USD at:

<http://buy.Microchip.com/ProductSearch.aspx?Keywords=PG164101>

The Baseline Flash Programmer (BFMP) is designed to be used with the PIC10F2XX Universal Programming Adapter as shown in figure 6 below:

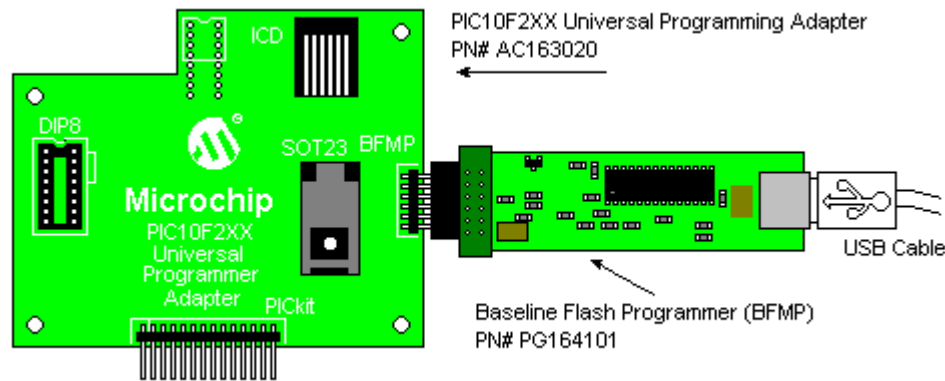


Figure 6 – Illustrating how to connect the Baseline Flash Programmer to the PIC10F2XX Universal Programming Adapter. The adapter cannot be used to program PIC10Fs on a 'converter board'.

### Using the PICKit 1 Programming Software with the Baseline Flash Programmer (BFMP)

- Connect the Baseline Flash Programmer (BFMP) to your PC, using the USB cable that came with the PICKit 1.
- Open



- Proceed as described above for the PICKit 1. The Baseline Flash Programmer uses the PICKit 1 software.

### Conclusion

This document has illustrated and described how to use three device programmers from Microchip Technology:

- The PICSTART Plus,
- The PICKit 1 Flash Starter Kit, and
- the Baseline Flash Programmer (BFMP)

We should also mention that you can use the PICKit 1 device programming software from within the MPLab environment. Simply open MPLab, and left-click on Select Programmer/ 1 PICKit 1.

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