Downloading a HEX file to an AT89C51RC2 using Atmel FLIP:

Downloading the program erases the previous program from Flash memory and programs the new HEX file in its place. Flash memory is non-volatile, meaning that its contents are preserved even when the power is switched off. Programs are removed by erasing Flash memory and Flash memory must be erased before programming.

A) Make sure the power switch on the circuit is turned off. The circuit should be switched off when making any changes to the hardware configuration to help prevent damage to the circuit.

B) Change the DPDT (double pole double throw) DIP switch (the red square part) to the ISP position. The ISP (In-System Programming) position connects the two BC574 transistors to the RS232 connector.

C) Connect the serial cable from the PC serial port to the 9-pin connector.

D) Turn the power on.

E) Start Atmel FLIP.

   1) Click on Settings>Preferences…

      a. Make sure the box labeled "ISP Hardware Conditions Controlled by FLIP" is checked. This will only need to be done once at the start of a session.

   2) Click on Device>Select… or the IC icon. Select the AT89C51RC2 from the list. This will only need to be done once at the start of a session.

   3) Click on Settings> Communication> RS232 or click on the Communication Cable icon.

      a. Select a baud rate (my preference is 57,600). Slower baud rates are more reliable, but take longer to download large files.

      b. Click on Connect. If the communication connects properly, the processor information will be read and displayed on the right section of the program window.

      c. If the communication does not connect, a timeout error will be displayed. Check the ISP switch position, power and RS232 connections.

   4) Click on File> Load Hex File… or the "Arrow into paper" icon to bring up the open file window. Locate the Hex file and click Open.

   5) Click on the Run button in the lower left of the program window. Each of the checked items in the Operations Flow is performed to download the hex code. Any errors that occur will cause that operation to highlight red.

   6) Click on the Start Application button to release the serial port so that Putty can use it.

F) Turn the power off.

G) Switch ISP switch back to the RUN position. The serial cable can remain connected to the circuit.

H) Turn the power on to start the program.