Embedded Software development Process and Tools:

Lesson-5

Getting Embedded Software into the Target System using Device Programmer

1. Device PROM or Flash Programmer

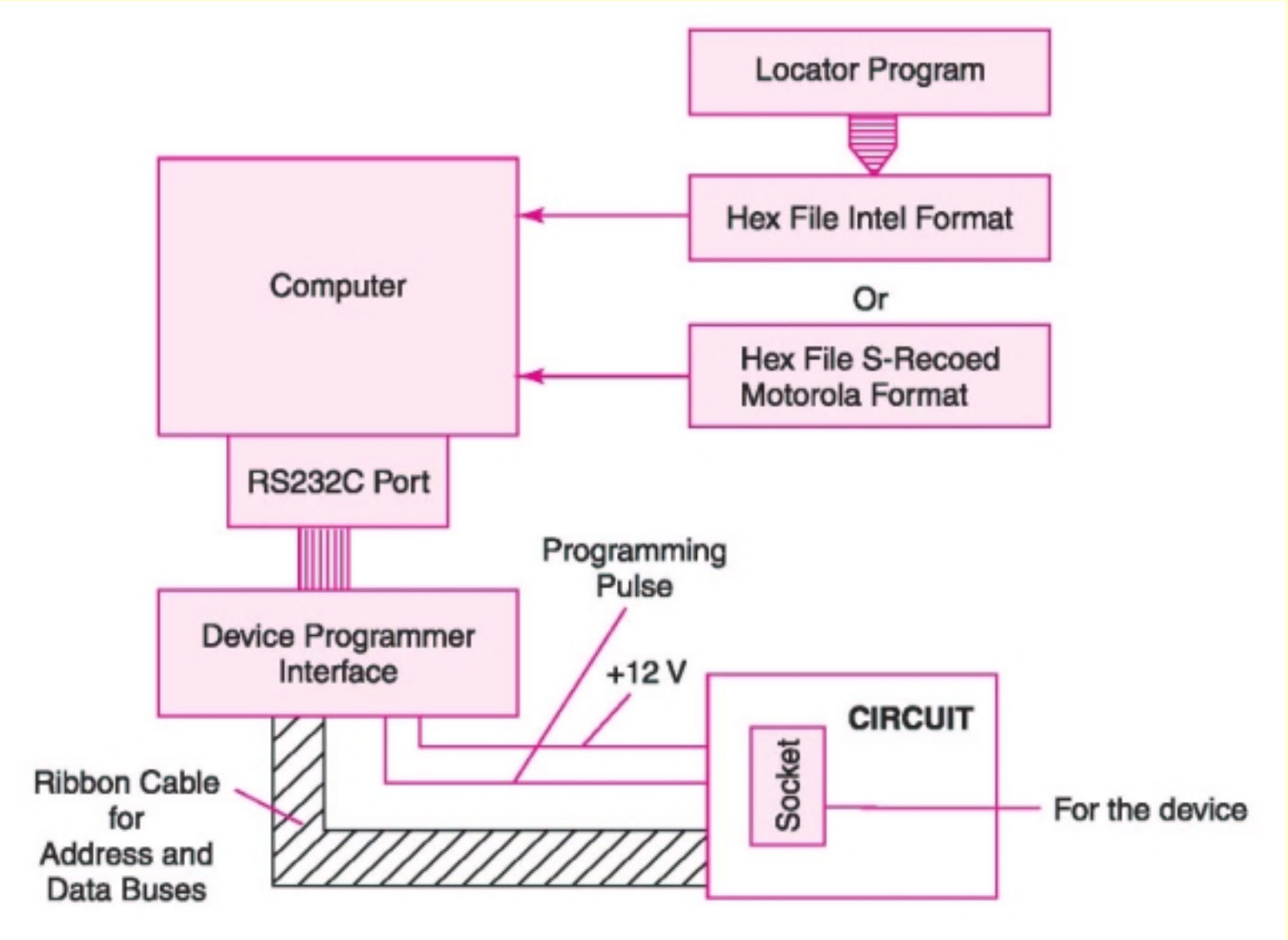
Device programmer

- also called laboratory programmer
- A programming system for a device
- Device selectable
- Device may be a PROM or EPROM chip or a flash or a unit in a microcontroller or PLA, GAL or PLC.

Device programmer

- Selected device inserts into a socket
- Programmed (burned the codes) by transfer of the bytes for each address using the software at the hos

Burning in of the application software codes, data and tables using a device programmer



Software of device programmer

- Runs at a host system
- The system interconnects with the socket and device programmer circuit usually through a serial port (UART or USB).

Software of device programmer…

- Running at the host uses an input file containing the from the locator software output records
- File reflects the final design and has a boot program plus the compressed record, which the processor decompresses before the embedded system processor starts execution.

Software of device programmer…

- Bootstrap program is the program to start up a system.
- An IDE incorporates the device programmer within it

2. Use of Device Programmer for Downloading the Finalized Codes into PROM or flash

Burning

- A process that places the codes.
- Codes downloaded, according to ROM image (*locator* output)
- Burning done in the laboratory using a device programmer into an erased EPROM or EEPROM or PROM or flash

3. Use of Device Programmer for Downloading the Finalized Codes into PROM or flash

Programming Method of the Device Programmer

- A device cell array (at the address defined by A0 to A19 signals) stores the ‘0’s as per 0s at D0 to D7 when a strobe pulse of a few microseconds duration applied in the presence of a high voltage of 12V by the device programmer circuit.

Programming Steps of the Device Programmer

(*i*) Applies the A0 to A19 bits as needed at a selected address input of the array of cells.

(*ii*) Applies as inputs, the D0 to D7 bits that are meant for that address.

Programming Steps of the Device Programmer…

- (*iii*) Applies a high voltage to make programming feasible for the needed duration in microseconds.
- (*iv*) Applies a programming pulse for a sufficient duration to cause fusing of the desired links in the array, to convert a '1' to '0'.
- (*v*) Switches off high voltage

Programming Steps of the Device Programmer…

- (*vi*) Applies a next higher address than the previous one.
- (vii) Repeats the above steps (*ii)* to (*iv)* for writing (converting) the logic states of the D0 to D7 bits at the current instance at the new address, and
- (viii) Continues till a cell array at the last desired address programmed.

Summary

We learnt

- Device programmer used to burn the binary image of the codes from the locator created files of Intel Hex or Motorola S format

End of Lesson-5 of chapter 13 on Getting Embedded Software into the Target System using Device Programmer