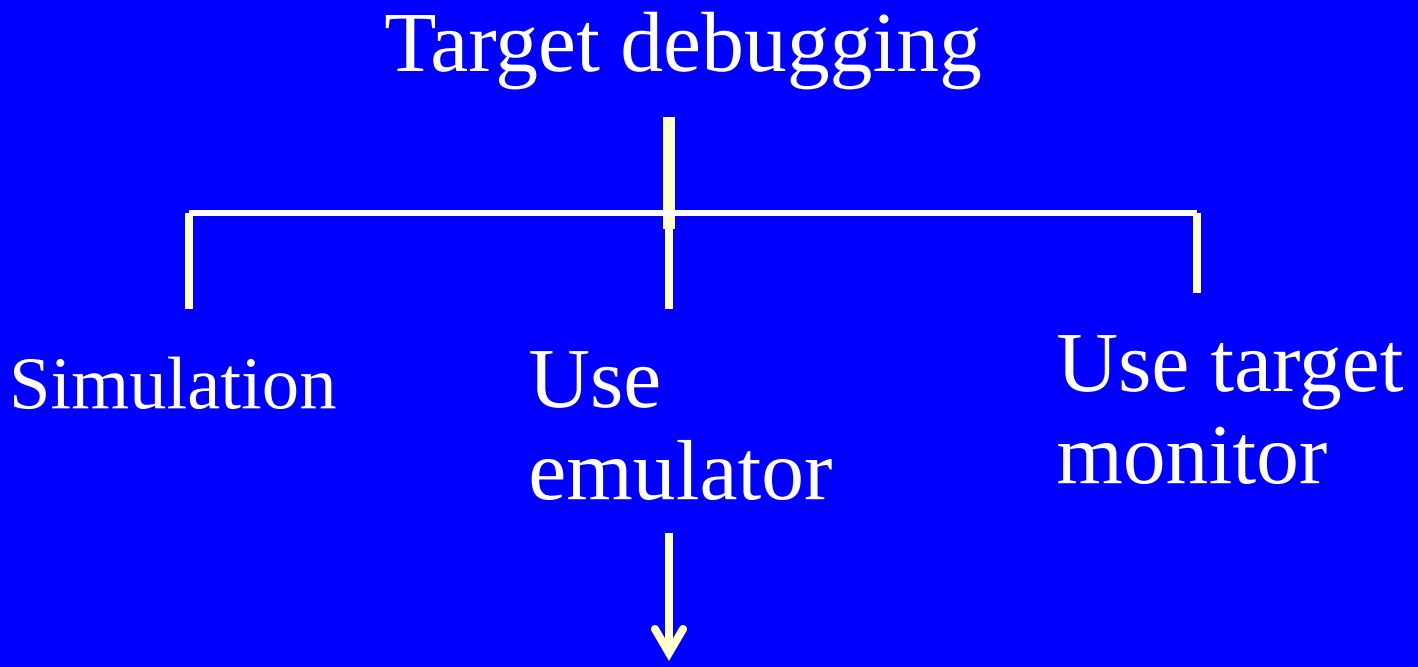
Testing, Simulation and Debugging Techniques and Tools:

Lesson-5

In-Circuit Emulator

1. Development processes using ICE

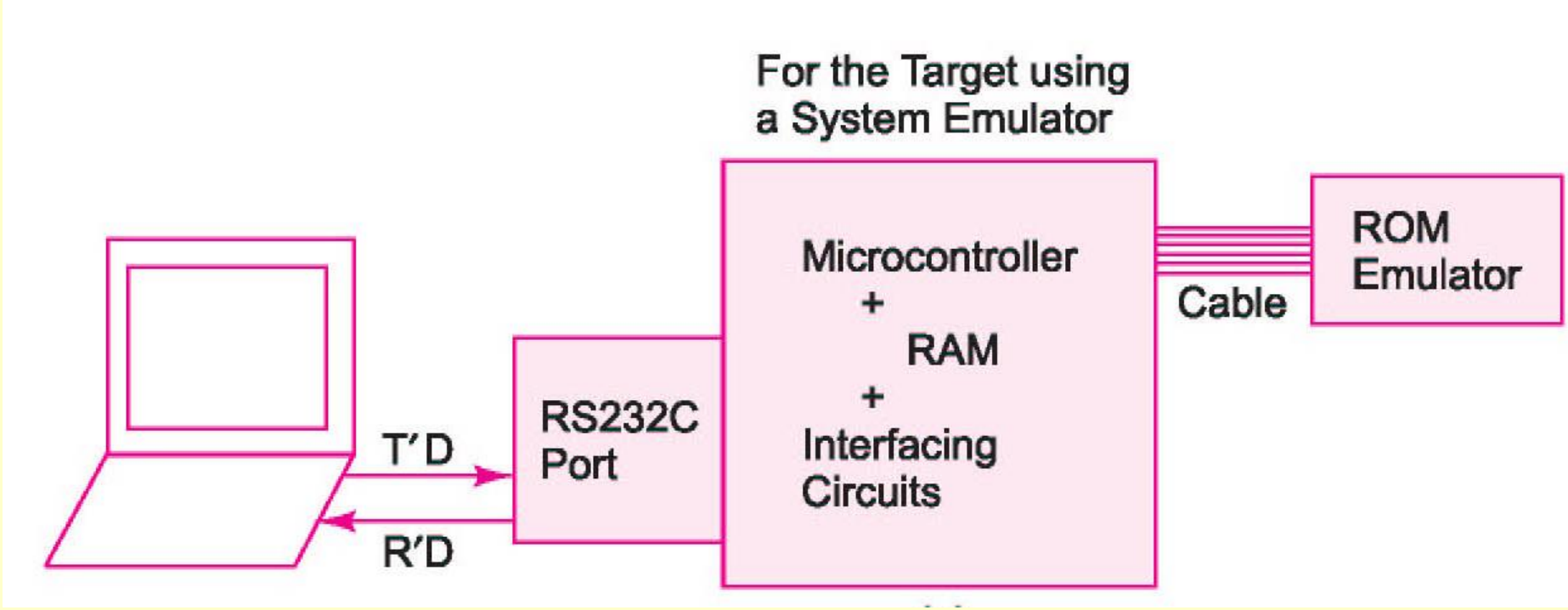


Circuit for emulating target system remains independent of a particular targeted system and processor

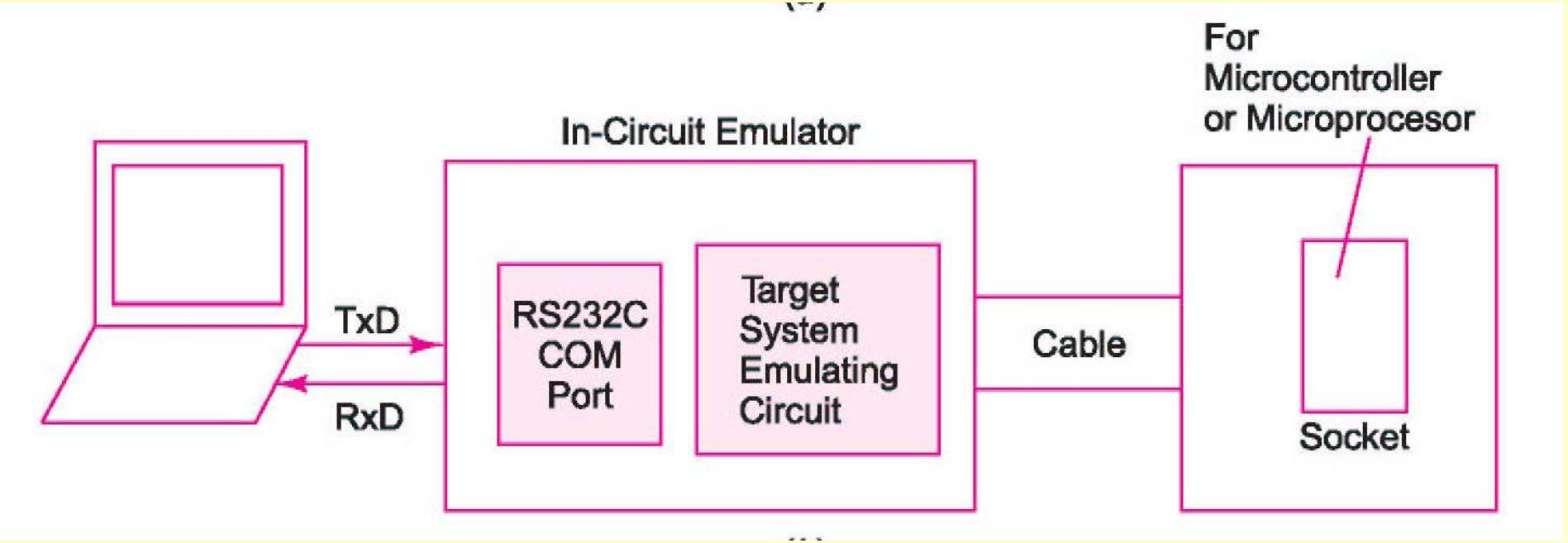
Using an Emulator or ICE

- A circuit for emulating target system remains independent of a particular targeted system and processor
- Emulator or ICE provides great flexibility and ease for developing various applications on a single system in place of testing that multiple targeted systems.

An Emulator


For the Target using
a System Emulator
Microcontroller
+
RAM
+
Interfacing
Circuits
Cable
ROM
Emulator
RS232C
Port
T′D
R′D

An ICE


For
Microcontroller
or Microprocesor
In-Circuit Emulator
TxD
RxD
RS232C
COM
Port
Target
System
Emulating
Circuit
Cable
Socket

Emulator

- Emulates MCU inputs from sensors
- Emulates controlled outputs for the peripheral interfaces/systems
- Emulates target MCU IOs and socket to connect externally MCU

ICE

- Means In-Circuit Emulator
- Interface COM port of a computer
- Emulates target MCU IOs
- ICE socket connects MCU externally

ICE…

- Uses computer developed object files and hex files for the MCU
- Uses debugger at the computer developed files for the MCU application

A Emulator

Difference in Emulator and ICE

- Emulator uses the circuit consisting of the microcontroller or processor itself. The emulator emulates the target system with extended memory and with codes downloading ability during the edit-test-debug cycles.

Emulator and ICE …

- ROM Emulator emulates only a ROM.
- ICE uses another circuit with a card that connects to target processor (or circuit) through a socket.

2. Back support hardware package and ICE Subunits

Back support hardware package and ICE Subunits

- Interface circuit
- Socket
- External Memory
- Emulator-board display unit
- Twenty-keys pad
- Registers
- Connectors

Summary

We learnt

- ICE used for debugging a target system without using the target processor microcontroller

We learnt

- Number of software tools used to develop software for designing an embedded system.
- Sophisticated tools─ RTOS, Integrated Development Environment and Prototype development tools needed for integrated development of system software and hardware.

End of Lesson-5 of chapter 15 on In-Circuit Emulator