Embedded Software development Process and Tools:

Lesson-3
Host and Target Machines

1. Host-Target Based Development Approach

Host-Target System Development Approach

- During development process, a host system is used

- Then locating and burning the codes in the target board.

- Target board hardware and software later copied to get the final embedded system

- Final system function exactly as the one tested and debugged and finalized during the development process

2. Host System

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

Host system at PC or workstation or laptop

- High performance processor with caches, large RAM memory

- ROMBIOS (read only memory basic input-output system)

- very large memory on disk

- keyboard

- display monitor

- mice

- network connection

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

Host system at PC or workstation or laptop…

- Program development kit for a high level language program or IDE

- Host processor compiler and cross compiler

- Cross assembler

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

2. Program Development Tool Kit at host

Program Development Tool Kit

- Program development tool kit or IDE

- Editor─ used for writing C codes or assembly mnemonics or C++ or Java or Visual C++ using the keyboard of the host system (PC) for entering the program.

- Using GUIs for allowing the entry, addition, deletion, insert, appending previously written lines or files, merging record and files at the specific positions.

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Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.
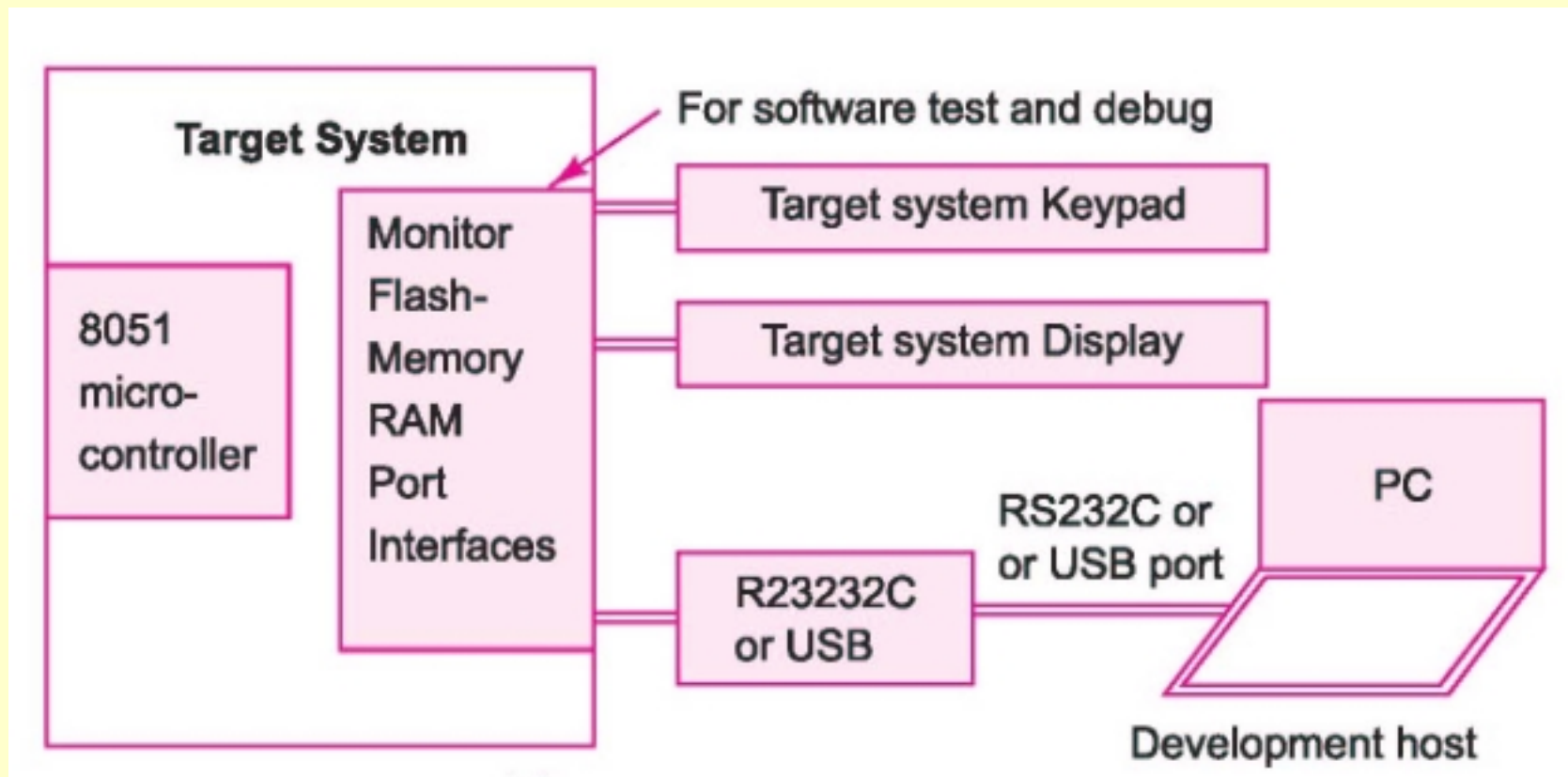
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Program Development Tool Kit…

- Create source file that stores the edited file.
- File given an appropriate name by the programmer
- Can use previously created files
- Can also integrate the various source files.
- Can save different versions of the source files.
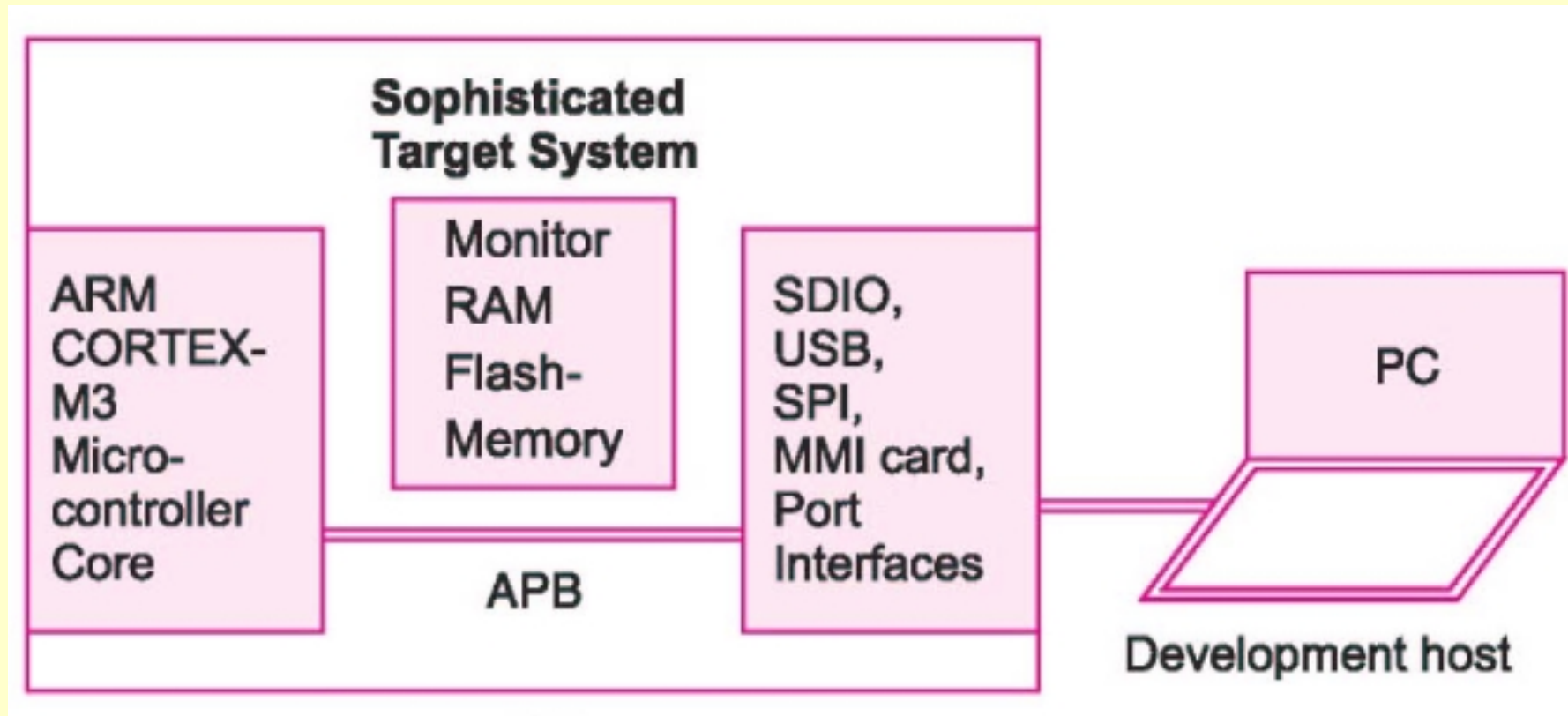
Program Development Tool Kit…

- Compiler, cross compiler, assembler, cross assembler, …

2. Target System

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

Target System Board

Target System

8051 micro-controller

Monitor
Flash-
Memory
RAM
Port
Interfaces

For software test and debug

Target system Keypad

Target system Display

R23232C or USB

RS232C or or USB port

PC

Development host

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Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

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Sophisticated Target System

Sophisticated Target System

ARM CORTEX-M3 Micro-controller Core

Monitor RAM Flash-Memory

SDIO, USB, SPI, MMI card, Port Interfaces

APB

PC

Development host

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Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

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Target and final systems .. .

- Target system differs from a final system

- Target system interfaces with the computer as well works as a standalone system

- In target system might be repeated downloading of the codes during the development phase.

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

Target and final systems .. .

- Target system copy made that later on functions as embedded system

- Designer later on simply copies it into final system or product.

- Final system may employs ROM in place of flash, EEPROM or EPROM in embedded system.

2. Target System Examples

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

Sophisticated ARM base System Targets

Sophisticated Target System Examples

(a)

Phillips LPC 21xx development board

ARM Powered STR710 ARM MCU System Development Board

Summary

We learnt

- Host system and software development tools used in developing, testing and debugging the embedded software in development process

Chapter-13 L03: "Embedded Systems - Architecture, Programming and Design" , Raj Kamal, Publs.: McGraw-Hill, Inc.

End of Lesson-3 of chapter 13 on Host and Target Machines