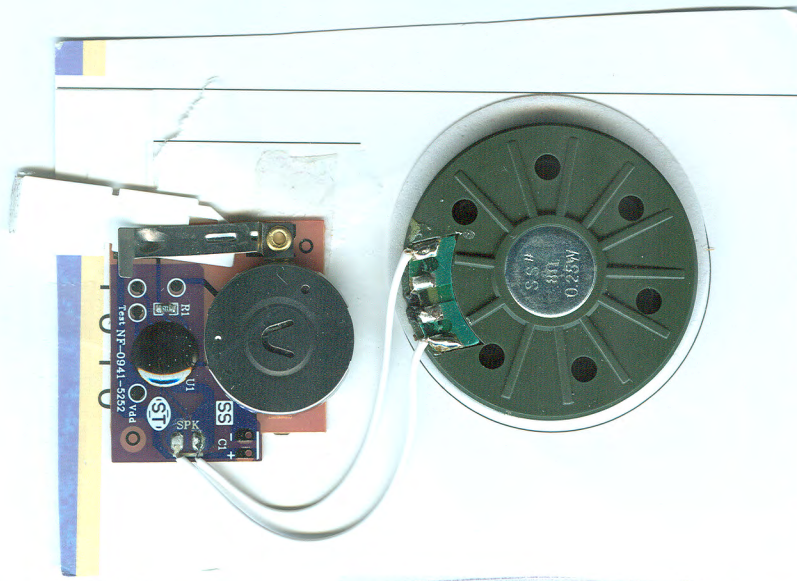


ECGR 4101/5101 - Lecture 10

Embedded app of the day  
Hallmark Card - music player Card

(1)



Chapter 4 - software

- 1) IDE
- 2) Debugging
- 3) Simple use of tools

Integrated Development environment

Many tools in one package

\* Compiler

\* Linker

\* Debugger

\* Downloader

\* Text Editor

\* "Project creator"

# ECGR 4101/5101 - Lecture 10

What do you need to know about your embedded system? (hardware) (2)

\* which microcontroller are you using?

\* Instruction → Compiler, Debugger

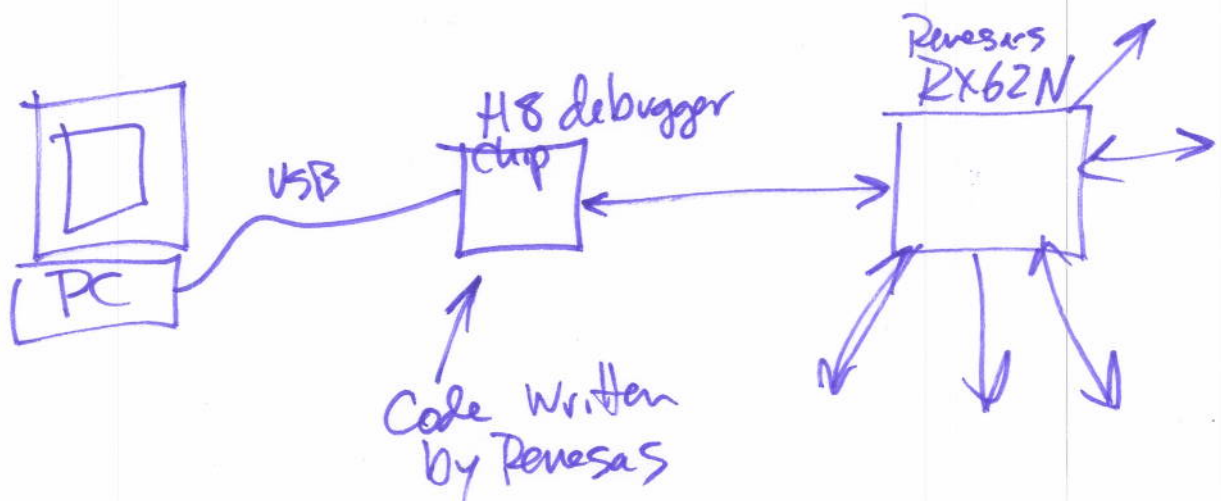
\* Architecture → Compiler, Debugger

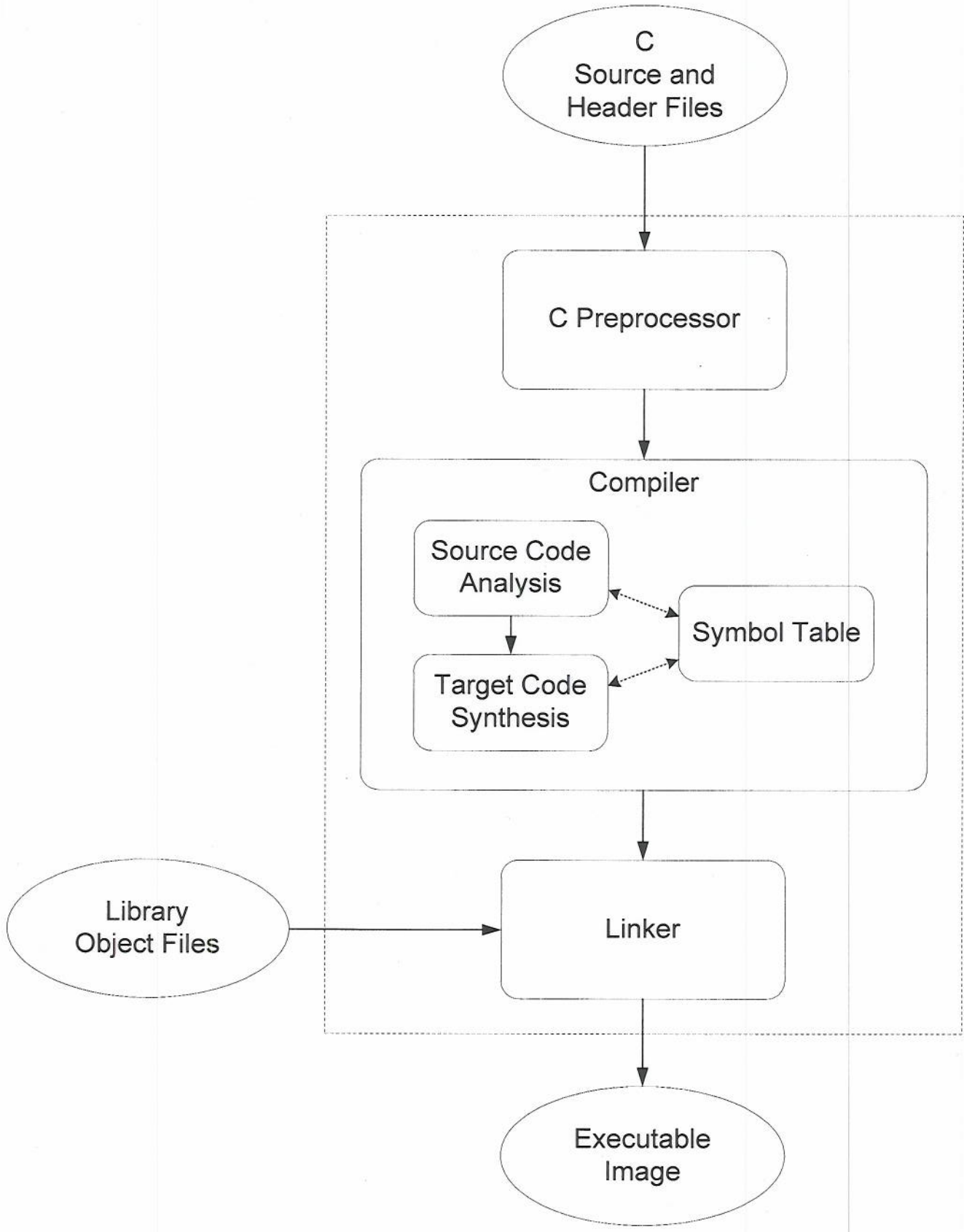
\* Memory → Linker, Down loader

\* ~~Peripherals~~ <sup>Compiler, Debugger</sup> Peripherals → all of above

\* Libraries/Tools/existing code

\* Definition/Mapping of hardware I/O devices to ports (0h)







# ECGR4101/S101 - Lecture 10

How much RAM?

0000 0000 to 0001 7FFF (4)

98 304

= 96K bytes

Where are our I/O devices "located" (addresses)?

0000 0000h	On-chip RAM
0001 8000h	Reserved area <sup>11</sup>
0008 0000h	Peripheral I/O registers
0010 0000h	On-chip ROM (data flash)
0010 8000h	Reserved area <sup>11</sup>
007F 8000h	FCU-RAM <sup>13</sup>
007F A000h	Reserved area <sup>11</sup>
007F C000h	Peripheral I/O registers
007F C500h	Reserved area <sup>11</sup>
007F FC00h	Peripheral I/O registers
0080 0000h	Reserved area <sup>11</sup>
00F8 0000h	On-chip ROM (program ROM) (write only)
0100 0000h	Reserved area <sup>11</sup>

FEFF E000h	On-chip ROM (FCU firmware) <sup>13</sup> (read only)
FF00 0000h	Reserved area <sup>11</sup>
FF00 C000h	On-chip ROM (user boot) (read only)
FF80 0000h	Reserved area <sup>11</sup>
FFF8 0000h	On-chip ROM (program ROM) (read only)
FFFF FFFFh	

```
#define PORT0 (*(volatile struct st_port0 __evenaccess *) 0x8C000)
#define PORT1 (*(volatile struct st_port1 __evenaccess *) 0x8C001)
#define PORT2 (*(volatile struct st_port2 __evenaccess *) 0x8C002)
#define PORT3 (*(volatile struct st_port3 __evenaccess *) 0x8C003)
#define PORT4 (*(volatile struct st_port4 __evenaccess *) 0x8C004)
#define PORT5 (*(volatile struct st_port5 __evenaccess *) 0x8C005)
#define PORT6 (*(volatile struct st_port6 __evenaccess *) 0x8C006)
#define PORT7 (*(volatile struct st_port7 __evenaccess *) 0x8C007)
#define PORT8 (*(volatile struct st_port8 __evenaccess *) 0x8C008)
#define PORT9 (*(volatile struct st_port9 __evenaccess *) 0x8C009)
#define PORTA (*(volatile struct st_porta __evenaccess *) 0x8C00A)
#define PORTB (*(volatile struct st_portb __evenaccess *) 0x8C00B)
#define PORTC (*(volatile struct st_portc __evenaccess *) 0x8C00C)
#define PORTD (*(volatile struct st_portd __evenaccess *) 0x8C00D)
#define PORTE (*(volatile struct st_porte __evenaccess *) 0x8C00E)
#define PORTF (*(volatile struct st_portf __evenaccess *) 0x8C00F)
#define PORTG (*(volatile struct st_portg __evenaccess *) 0x8C010)
```