1DT301, Computer Technology, Autumn 2019
Lab. 6: CyberTech Wall Display

Goal for this lab:
The aim is to use STK600 for communication with an external device. In this case, a display that has its own protocol and the documentation is not entirely clear. Description of the protocol (CyberTech_Display.pdf) and installation manual are available on the website (mymoodle.lnu.se); see also Lecture 4 on Embedded C Programming.

The program should be written in C.

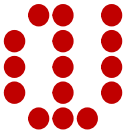
Presentation of results:
Present each task for the tutor when you have solved the task. All programs should be put together in one Word-file and sent to the teacher(s) after the lab.
Use extensively comments in the program to explain the functionality of code parts. Each program should also have a header like the examples in previous labs.

Task 1: Write a program that writes a character on the CyberTech Display.
Any character can be displayed. The display is connected to the serial port (RS232) on the STK600. Communication speed is 2400 bps.

Ckecksum is calculated modulo 256.
The frame ”Afbeeld” consists of following fields:
[START] [ADRESS] [COMMAND] [CHECKSUM] [END]

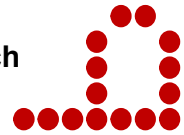
That will be: [0x0D] [’Z’] [’D001’] [’3C’] [0x0A] (Z as address means all = broadcast.)

Check sum is calculated on what is in the frame before the check sum, ie:
0D + 5A + 44 + 30 + 30 + 31 = 13C (Decimal: 13 + 90 + 68 + 48 + 48 + 49 = 316)
Modulo 256 = 3C in hexadecimal format.



The checksum is 3C in this case. Note that the checksum must be entered as ASCII characters, thus the characters **3** and **C** in this case!

Task 2: Write a program that writes characters on all text-lines on the CyberTech Display.
The program will write to all three rows.



Task 3: Write a program that change text strings on the display.
Example text:

Computer Science, 2015
Computer Technology
Assignment #6
Your names. Change after 5 sec.

The display can’t display Swedish characters å, ä or ö.

Task 4: Write a program that communicates with both the terminal and the display.
Since we only have one serial port, we must make a special cable, so that the STK600 receive unit is connected to the terminal (PuTTY, for instance) and transmit is connected to the display. Text can be entered at the terminal. End of line with a special character that you choose. It should also be possible to enter address on the screen to display text.

Task 5: Write a program for text input.
When text is inserted it should be possible to choose the address (1 - 9) of the display and send it via the serial port.