

*****Draft*****

**Icarus Simulator
helloworld simulation
repo 102121icozip
10/10/23**

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The helloworld_tb.v needs to be created. See catboard-relook/doc/iverilog/helloworld_tb.v

```
devel@pi4-20:~ $ cd 102121icozip/rtl/uart/
```

```
devel@pi4-20:~/102121icozip/rtl/uart $ iverilog -o dsn helloworld_tb.v helloworld.v
```

The following

```
initial  
begin  
#1920000  
$finish();  
end
```

```
devel@pi4-20:~/102121icozip/rtl/uart $ vvp dsn  
VCD info: dumpfile helloworld.vcd opened for output.  
devel@pi4-20:~/102121icozip/rtl/uart $
```

```
devel@pi4-20:~/102121icozip/rtl/uart $ vvp dsn  
VCD info: dumpfile helloworld.vcd opened for output.  
Killed
```

```
devel@pi4-20:~ $ kill -9 9093
```

```
devel@pi4-20:~/102121icozip/rtl/uart $ gtkwave helloworld.vcd
```

GTKWave Analyzer v3.3.104 (w)1999-2020 BSI

[0] start time.
[1920000000] end time.

```
devel@pi4-20:~/102121icozip/rtl/uart $ gtkwave helloworld.vcd
```

GTKWave Analyzer v3.3.104 (w)1999-2020 BSI

Near byte 57770007, Unknown VCD identifier: '11101100101000010010'

{0} start time:
{9697700} end time:

```
    reg    pwr_reset;  
    initial pwr_reset = 1'b1;  
    always @(posedge i_clk)  
        pwr_reset <= 1'b0;
```

```
    reg    [24:0] ledctr;  
    initial ledctr = 0;
```

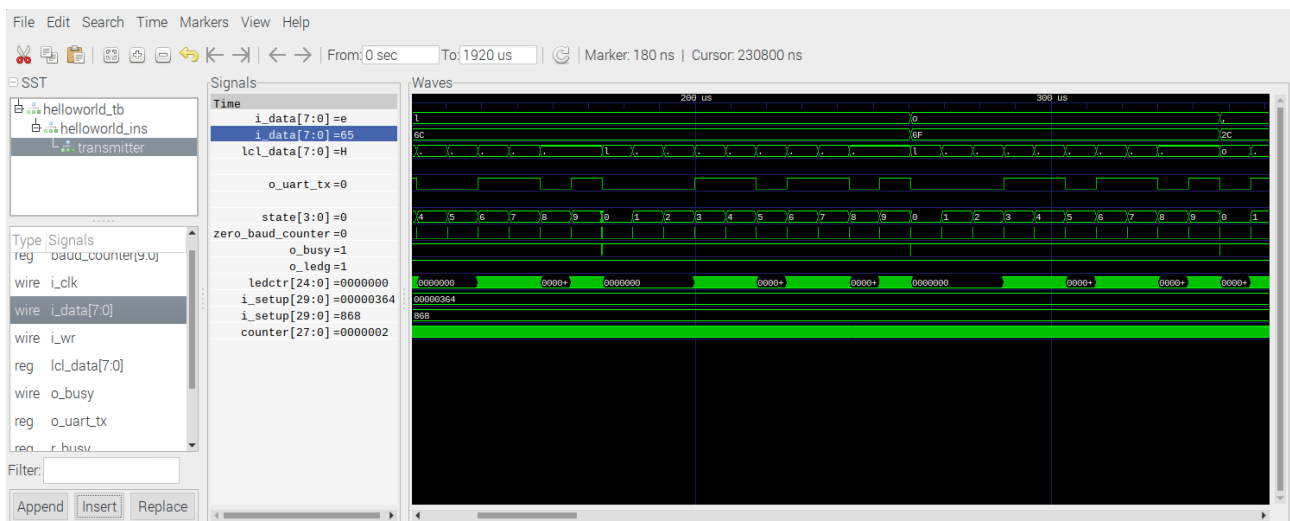
```

always @(posedge i_clk)
    if (!o_uart_tx)
        ledctr <= 0;
    else if (ledctr != {(25){1'b1}})
        ledctr <= ledctr + 1'b1;
assign o_ledg = !ledctr[24];

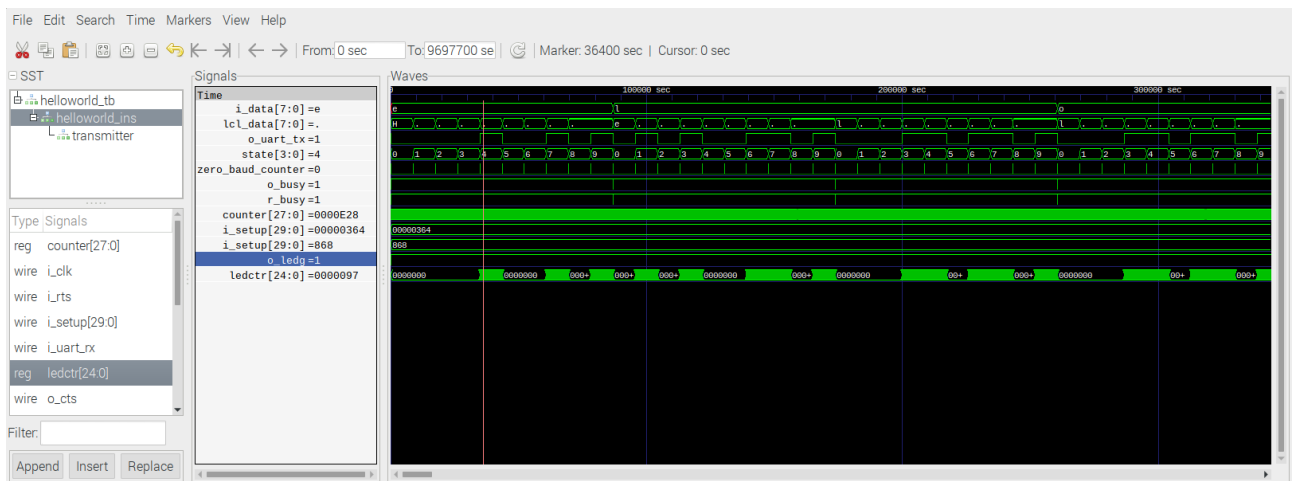
reg    [7:0]  message    [0:15];

initial begin
    message[ 0] = "H";
    message[ 1] = "e";
    message[ 2] = "l";
    message[ 3] = "l";
    message[ 4] = "o";
    message[ 5] = ",";
    message[ 6] = " ";
    message[ 7] = "W";
    message[ 8] = "o";
    message[ 9] = "r";
    message[10] = "l";
    message[11] = "d";
    message[12] = "!";
    message[13] = " ";
    message[14] = "\r";
    message[15] = "\n";
end

```



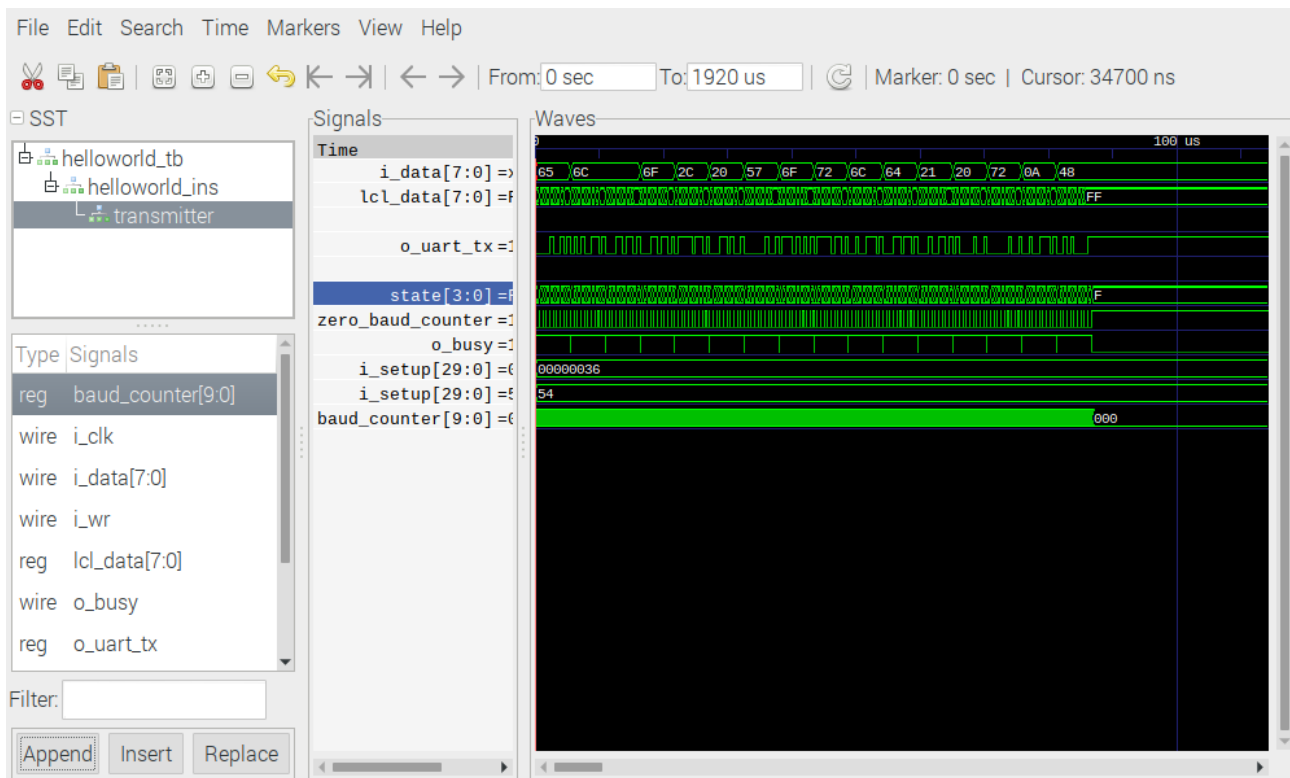
The above image has time where as the image below time is unknown.



i_setup is 0x364 or 868 is for a baudrate 115200.

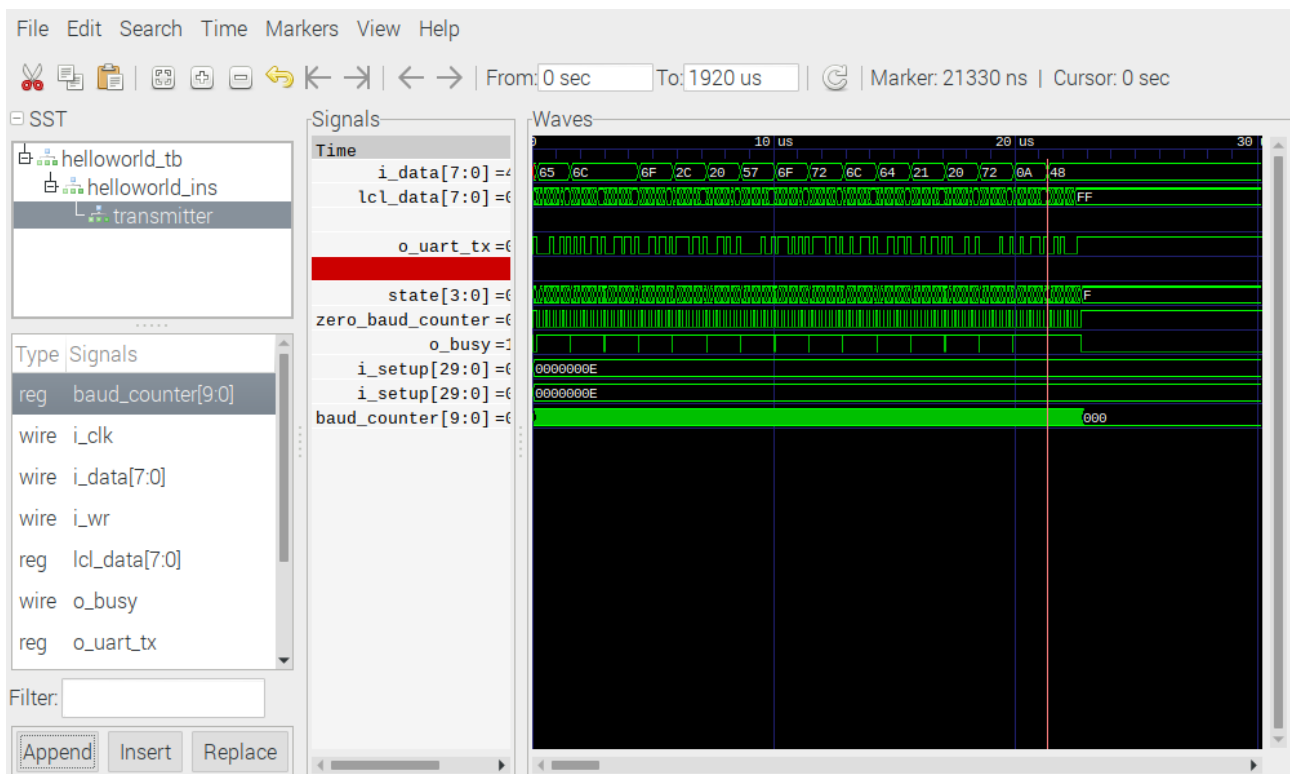
		868.055555
100000000	115200	555556
		434.027777
100000000	230400	777778
		289.351851
100000000	345600	851852
		217.013888
100000000	460800	888889
		108.506944
100000000	921600	444444
		54.2534722
100000000	1843200	222222

In the image below the baud rate would be increased 1M.
15 characters transmitted in 81400ns.



Xx

In the image below the baud rate would be increased 4M.
15 characters transmitted in 21300ns.



XX

state is 0-9 for the 10 bits to transmit 1 ASCII chacter.

```
devel@pi4-20:~/102121icozip/rtl/uart $ git diff helloworld.pcf
diff --git a/rtl/uart/helloworld.pcf b/rtl/uart/helloworld.pcf
index 8337466..b12f38f 100644
--- a/rtl/uart/helloworld.pcf
+++ b/rtl/uart/helloworld.pcf
@@ -13,6 +13,6 @@ set_io o_ledg A9          #IOT_194 LED1
#set_io o_ledr B7          #IOT_207 LED4

set_io i_rts A1            #IOT_220 PM2-A1 i_rts
-set_io o_uart_tx B3       #IOT_214 PM2-A3
-set_io i_uart_rx B5       #IOT_223 PM2-A2
+set_io o_uart_tx B3       #IOT_214 PM2-A2
+set_io i_uart_rx B5       #IOT_223 PM2-A3
set_io o_cts B6           #IOT_208 PM2-A4 o_cts
```