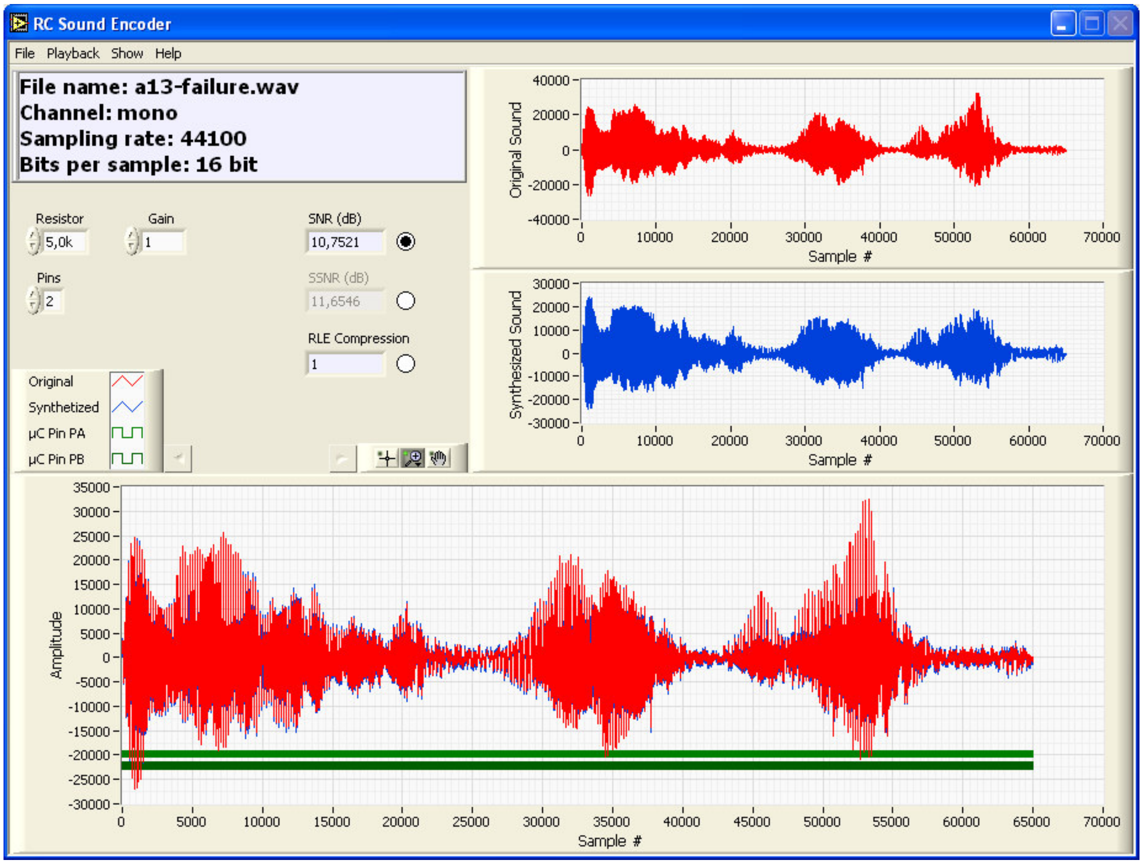
How to make your own samples

Required tools

- Sound edit software, Windows sound recorder will do, but there's always better
- RC Sound encoder
  ftp://ftp.circuitcellar.com/pub/Circuit_Cellar/2005/180/Barron180.zip
- Atmel Avr studio 4 www.atmel.com
- I2C Eeprom programmer including software

Lets get started

First of all we need some audio files. You can record your own voice with windows sound recorder or do just like me and search the net for some nice samples.
In this sample we use PCM, 44100Hz, 16 bit mono. Samples must be in the WAV format. Lower sampling rate is also possible, but then you need to recalculate the timer isr in Bascom.
Start Rc sound decoder and open your WAV file. Switch off *RLE compression*, this is not supported in the Bascom sample. *Resistor* and *pins* is the setting for the hardware you made, press the *Show* menu to get some help on the hardware.
After checking the sample with the *playback* button we need to save it. We save the sample as ASM, so choose *save ASM file*.

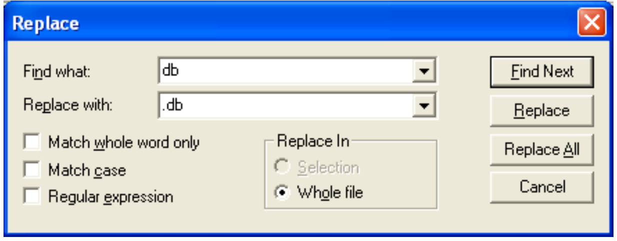


File name: a13-failure.wav
Channel: mono
Sampling rate: 44100
Bits per sample: 16 bit

Resistor: 5,0k
Gain: 1
Pins: 2
SNR (dB): 10,7521 ●
SSNR (dB): 11,6546 ○
RLE Compression: 1 ○

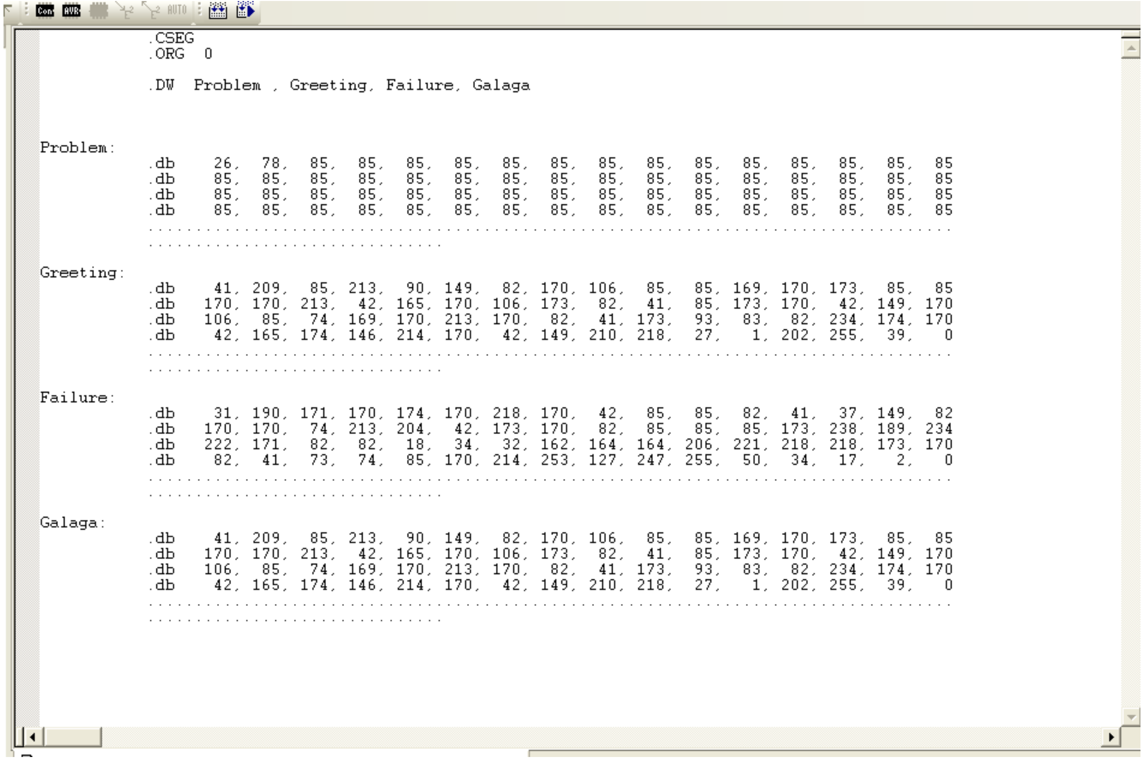
Next step is building the hex file for the i2c eeprom, fire up Atmel avr studio 4.

Then, create a new AVR assembler project and copy/paste your audio ASM samples into avr studio. Add the 3 lines at the top of the listing as shown in the picture below. (.CSEG etc..)
Now we need to add to every line a . (point) for the db.
Choose Edit -> replace and replace all db with .db



Find what: db
Replace with: .db
☐ Match whole word only
☐ Match case
☐ Regular expression
Replace In
○ Selection
● Whole file

Now the listing is ready, it should look like the image below, only longer.
The Line .*DW Problem, Greeting, Failure, Galaga* is the index for the eeprom. The names should be equal to the data and in the same order as the data chunks.



```
              .CSEG
              .ORG   0

              .DW  Problem , Greeting, Failure, Galaga


Problem:
              .db    26,  78,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85
              .db    85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85
              .db    85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85
              .db    85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85,  85
              ...................................................................................
              ..............................

Greeting:
              .db    41, 209,  85, 213,  90, 149,  82, 170, 106,  85,  85, 169, 170, 173,  85,  85
              .db   170, 170, 213,  42, 165, 170, 106, 173,  82,  41,  85, 173, 170,  42, 149, 170
              .db   106,  85,  74, 169, 170, 213, 170,  82,  41, 173,  93,  83,  82, 234, 174, 170
              .db    42, 165, 174, 146, 214, 170,  42, 149, 210, 218,  27,   1, 202, 255,  39,   0
              ...................................................................................
              ..............................

Failure:
              .db    31, 190, 171, 170, 174, 170, 218, 170,  42,  85,  85,  82,  41,  37, 149,  82
              .db   170, 170,  74, 213, 204,  42, 173, 170,  82,  85,  85,  85, 173, 238, 189, 234
              .db   222, 171,  82,  82,  18,  34,  32, 162, 164, 164, 206, 221, 218, 218, 173, 170
              .db    82,  41,  73,  74,  85, 170, 214, 253, 127, 247, 255,  50,  34,  17,   2,   0
              ...................................................................................
              ..............................

Galaga:
              .db    41, 209,  85, 213,  90, 149,  82, 170, 106,  85,  85, 169, 170, 173,  85,  85
              .db   170, 170, 213,  42, 165, 170, 106, 173,  82,  41,  85, 173, 170,  42, 149, 170
              .db   106,  85,  74, 169, 170, 213, 170,  82,  41, 173,  93,  83,  82, 234, 174, 170
              .db    42, 165, 174, 146, 214, 170,  42, 149, 210, 218,  27,   1, 202, 255,  39,   0
              ...................................................................................
              ..............................
```

Now it’s time to build the hex file.
First set the hex output format under *project -> assembler options* to Intel Hex 8.
Now press *Build -> Build* (or F7) and voila, finished. Check the build window for errors.
The i2c eeprom hex file is now finished and can be programmed with your programmer.