

Project #2

Michael Schoen, Osman Abdirahman, Illya Starikov

Due Date: November 8th, 2016

1 Explanation

1.1 Music

We know the frequency of the Philips P89LPC932A1 to be 7.373 MHz, with 2 cycles per machine cycle. Therefore,

$$\frac{2 \text{ cycles}}{\text{machine cycle}} \cdot \frac{1 \text{ Period}}{7.373 \text{ MHz}} = 0.271 \text{ } 26 \text{ } \mu\text{s}/\text{mc} \quad (1)$$

We use this calculation as the base for our music.

E5	$f = 659.255 \text{ Hz} \implies T = 1516 \text{ }\mu\text{s}$ $1516 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 5589 \text{ mc}$ $5589 \text{ mc} \div 4 = 1398 \text{ mc}$ $1398 \text{ mc} \implies 699 \text{ iterations (with DJNZ)}$
F5	$f = 698.456 \text{ Hz} \implies T = 1431 \text{ }\mu\text{s}$ $1431 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 5275 \text{ mc}$ $5589 \text{ mc} \div 4 = 1318 \text{ mc}$ $1318 \text{ mc} \implies 569 \text{ iterations (with DJNZ)}$
G5	$f = 783.991 \text{ Hz} \implies T = 1275.5 \text{ }\mu\text{s}$ $1275.5 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 4702 \text{ mc}$ $4702 \text{ mc} \div 4 = 1176 \text{ mc}$ $1176 \text{ mc} \implies 588 \text{ iterations (with DJNZ)}$
D5	$f = 587.330 \text{ Hz} \implies T = 1702.6 \text{ }\mu\text{s}$ $1702.6 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 6277 \text{ mc}$ $7045 \text{ mc} \div 4 = 1570 \text{ mc}$ $1570 \text{ mc} \implies 785 \text{ iterations (with DJNZ)}$
C5	$f = 523.251 \text{ Hz} \implies T = 1911.1 \text{ }\mu\text{s}$ $1911.1 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 7045 \text{ mc}$ $7045 \text{ mc} \div 4 = 1760 \text{ mc}$ $1760 \text{ mc} \implies 880 \text{ iterations (with DJNZ)}$
Flat D5	$f = 554.365 \text{ Hz} \implies T = 1803.8 \text{ }\mu\text{s}$ $1803.8 \text{ }\mu\text{s} \div 0.27126 \text{ }\mu\text{s}/\text{mc} = 6650 \text{ mc}$ $6650 \text{ mc} \div 4 = 1662 \text{ mc}$ $1662 \text{ mc} \implies 831 \text{ iterations (with DJNZ)}$

2 Future Work

3 Project Code

4 Work Effort

- Michael Schoen
- Osman Abdirahman
- Illya Starikov