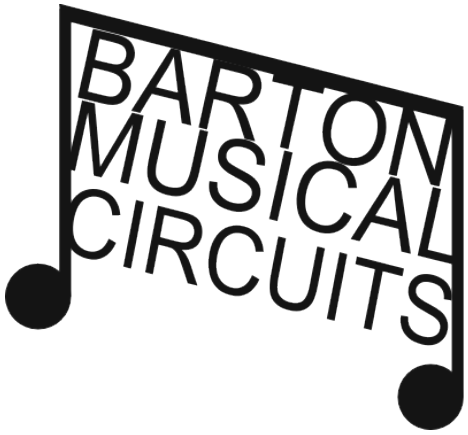
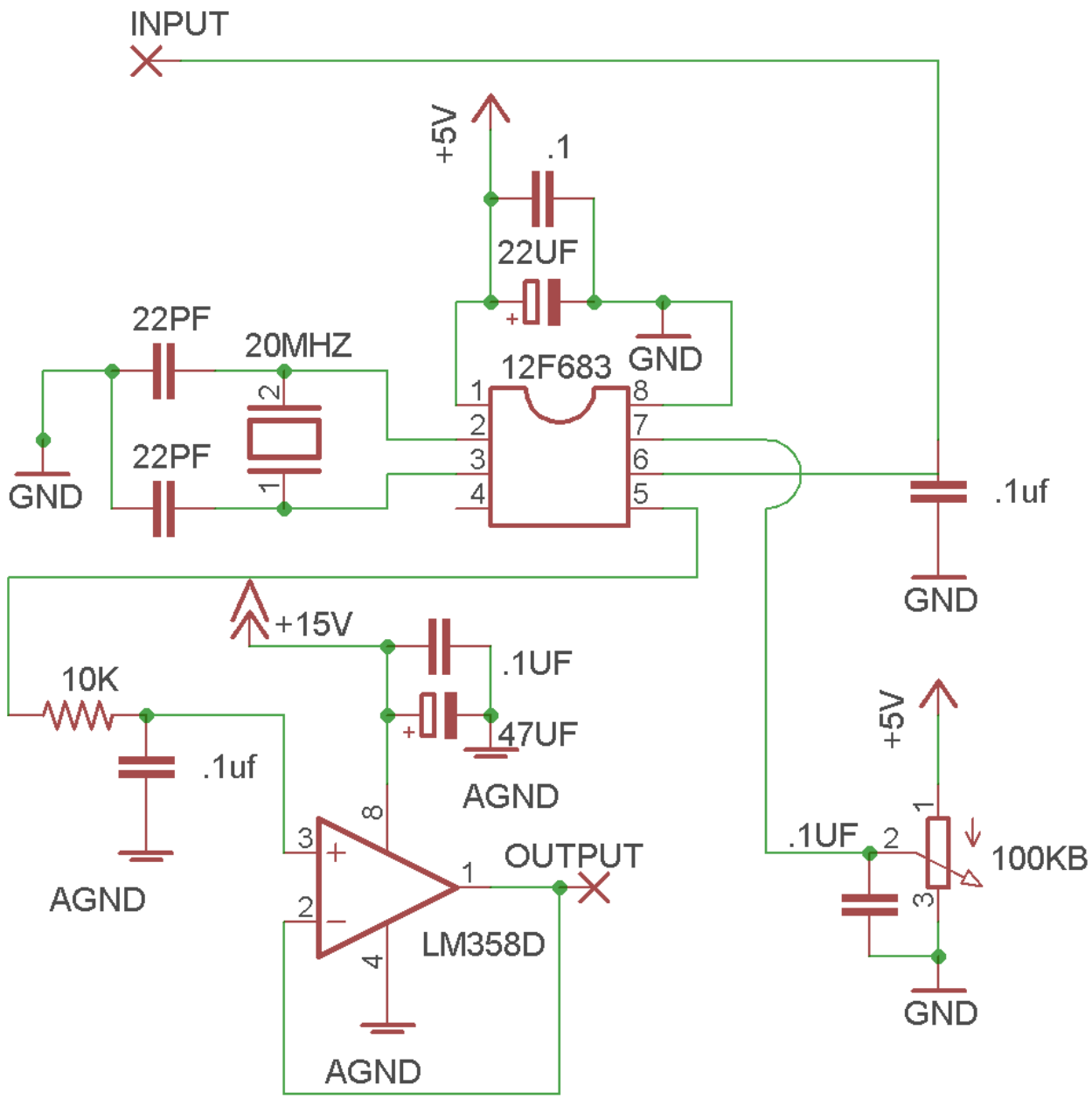


SIMPLE CV QUANTIZER
REV 2.0

Last Updated 10-10-2010

1.SCHEMATIC


INPUT
+5V
.1
22UF
22PF
20MHZ
12F683
GND
22PF
GND
.1uf
GND
+15V
.1UF
10K
47UF
.1uf
AGND
AGND
OUTPUT
LM358D
AGND
+5V
.1UF
100KB
GND

2.PARTS LIST.

PART	MOUSER Part #
C1 - .1UF FILM CAP	- 80-MMK5104J50J01TR18
C2 - 22UF 16V ELECTROLYTIC	- 647-UVR1C220MDD
C3 - 22PF CERAMIC	- 80-C322C220K2G5CA
C4 - 22PF CERAMIC	- " "
C5 - .1UF FILM CAP	- 80-MMK5104J50J01TR18
C6 - .1UF FILM CAP	- 80-MMK5104J50J01TR18
C7 - .1UF FILM CAP	- 80-MMK5104J50J01TR18
C8 - 47UF 16V ELECTROLYTIC	- 647-UVR1C470MDD1TD
C9 - .1UF FILM CAP	- 80-MMK5104J50J01TR18
R1 - B100K PC MOUNT 16MM POT	- RV170F-24-15R1-B15
R2 - 10K	- 71-CCF0710K0JKE36
IC1 - 12F683 PROGRAMMED FOR CV QUANTIZER	- n/a
IC2 - LM358	- 512-LM358AN
7805 VOLTAGE REGULATOR *	- LM7805ACT
20MHZ CRYSTAL OSCILLATOR	- 815-AB-20-B2

***OPTIONAL – See Circuit Description.**

The part numbers provided are simply those of the parts I used when building the circuit for myself, it is not critical for you to buy these specific brands. I am not affiliated with Mouser in any way, I am simply a happy customer. These part numbers are subject to change.

3.CIRCUIT DESCRIPTION.

The purpose of this circuit is to quantize control voltages to a musical mode for use with an oscillator using the 1v/oct standard. Turning the mode selection knob from most counter clockwise to fully clockwise the following modes are available:

1.Bypass – Whatever voltage goes in, comes out.
2.Major – C, D, E, F, G, A, B
3.Minor – C, D, Eb, F, G, Ab, B,
4.Major Pentatonic – C, D, E, G, A
5.Minor Pentatonic – C, Eb, F, G, Bb
6.Blues – C, Eb, F, Gb, G, Bb
7.Whole Tone – C, D, E, Gb, Ab, Bb
8.Chromatic – C, Db, D, Eb, E, F, Gb, G, Ab, A, Bb, B

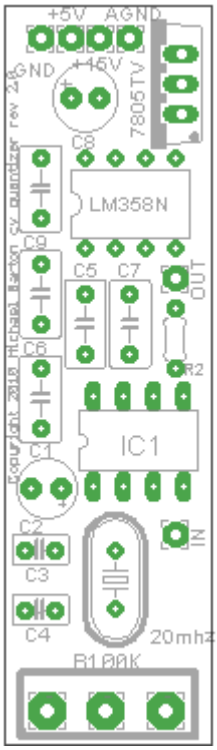
The incoming control voltage is routed through the pad marked “IN” to IC1 on pin 6. R1 (marked B100k on the board) forms a voltage divider which creates a voltage which when inputted to pin 7 of IC1 selects a musical mode to be quantized to. The input is compared to all acceptable voltages in that musical mode and the closest match is outputted to the chip's PWM (pulse width modulator). A 20khz pulse is then outputted to pin 5 with a pulse width corresponding to the desired output voltage. This pulse is then filtered by R2 and C7, and then buffered by IC2 and then outputted through the pad marked “OUT.”

IC1 and it's accompanying circuitry has a separate ground from the other components which is connected on the pad labeled “GND” on the board. Power for these parts is supplied either by either an external +5Vdc supply attached to the pad labeled “+5V” on the board or from an on board 7805 voltage regulator (use one or the other, do not install the 7805 if using an external +5v supply). If building multiples of this circuit you may use one on board 7805, then use the “+5V” pad to supply this voltage to another board. C1, C2, C5 and C6 provide power supply filtering and decoupling for this circuitry. C3, C4 and the 20mhz Crystal provides a timing pulse for IC1.

IC2 and it's accompanying circuitry is grounded through the pad labeled “AGND.” V+ for this section should be applied to the pad labeled “+15v.” +15v is non-critical, the circuit has been tested at voltages as low as +9v with no noticeable differences. C9 and C8 provide power supply filtering and decoupling for this circuitry.

4.THE BOARD.

The PCB for this project is designed to be mounted to a panel by the 100K pot. It is .7”x2.4” in dimension. A socket should be used for IC1 and is recommended for IC2. All polarized components have their polarities marked. The voltage regulator should be oriented with the taller side away from the edge of the board.



5.REVISION HISTORY

10-10-10
Redrew schematic. Updated circuit description to correspond with a change in the firmware (seperating major and minor modes). Added information on board.

10-4-10
First created.

Please e-mail Michael@Bartonmusicalcircuits.com with any questions or comments.