PCM modulation

desinged by: Alireza Sotoodeh

step1) PAM modulation (Sampling)

+12v

INPUT SIGNAL

input_signal

U2   SUB_PAM MODULATOR

R5
800

R6
800

D3
1N4007

C1
10nF

C3
500nF

8 R VCC
4

Q 3

clk

PAM_neg

PAM_pos

DC 7

CV 5

TR 2   GND TH 6

1

555

input_signal

CCT003

PAM_POSTIVECYCLE
PAM_POSTIVECYCLE
PAM_NEGETIVECYCLE
PAM_NEGETIVECYCLE

step2) compare PAM output Quantization

SUB_COMPARATOR

+1	+1out	-1out	-1
+1.5	+1.5out	-1.5out	-1.5
+2	+2out	-2out	-2
+2.5	+2.5out	-2.5out	-2.5
+3	+3out	-3out	-3
+3.5	+3.5out	-3.5out	-3.5
+4	+4out	-4out	-4
+4.5	+4.5out	-4.5out	-4.5

PAM_NEGETIVECYCLE   PAM_in_neg
PAM_POSTIVECYCLE   PAM_in_pos
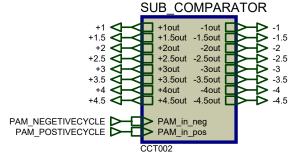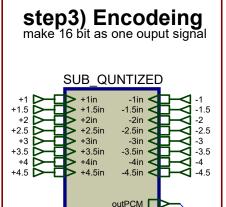
CCT002

(16 bit negetive and posetive output)

in this stage created PAM will be compare
using OPAmp741 in comparator mode for extracting
16 bit data

step3) Encodeing
make 16 bit as one ouput signal

SUB_QUNTIZED

+1	+1in	-1in	-1
+1.5	+1.5in	-1.5in	-1.5
+2	+2in	-2in	-2
+2.5	+2.5in	-2.5in	-2.5
+3	+3in	-3in	-3
+3.5	+3.5in	-3.5in	-3.5
+4	+4in	-4in	-4
+4.5	+4.5in	-4.5in	-4.5

outPCM

CCT001

outPCM

stage1) PAM

5.00

PAM_POSTIVECYCLE
PAM_NEGETIVECYCLE

0.00

-5.00

0.00   10.0m   20.0m

stage2) Quantization

+4.5out
+4out
+3.5out
+3out
+2.5out
+2out
+1.5out
+1out
-1out
-1.5out
-2.5out
-3out
-3.5out
-4out
-4.5out

0.00   10.0m   20.0m

stage3) Encode

10.0   outPCM

5.00

0.00

0.00   10.0m   20.0m