module qam16(in,out);  
input [0:3] in;  
output out;  
voltage in,out;  
  
parameter real freq = 1.0 from (0:inf);  
parameter real ampl = 1.0, thresh = 2.5;  
parameter real tdelay = 0 from [0:inf),  
ttransit = 1/freq;  
  
real x,y,phi;  
integer row,col;  
  
analog  
begin  
row = 2\*(V(in[3]) > thresh + V(in[2]) > thresh);  
col = 2\*(V(in[1]) > thresh + V(in[0]) > thresh);  
  
x = transition(row-1.5,tdelay,ttransit);  
y = transition(col-1.5,tdelay,ttransit);  
  
phi = 2 \* `M\_PI \* freq \* $realtime();  
V(out) <+ ampl \* (x \* cos(phi) + y \* sin(phi));  
end  
endmodule