

```
Modulation_gain = 5;
```

```
t=0:0.01:18.86;
```

```
play=1;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%OSCILLATOR 1%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
phase1= 2*pi*get(handles.phase1,'Value');
```

```
oct1 = str2double(get(handles.oct_sel1,'String'));
```

```
axes(handles.axes1);
```

```
wave_select1= (get(handles.wave_sel_oscl,'Value'));
```

```
Volume1= (get(handles.vol1,'Value'));
```

```
switch wave_select1
```

```
    case 1
```

```
        plot (sin(t));
```

```
    case 2
```

```
        plot (sawtooth(t, 0.5));
```

```
    case 3
```

```
        plot (sawtooth(t));
```

```
    otherwise
```

```
        plot (square(t));
```

```
end;
```

```
axis off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%OSCILLATOR 2%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
phase2= 2*pi*get(handles.phase2,'Value');
```

```
oct2= str2double(get(handles.oct_sel2,'String'));
```

```
B2= Modulation_gain*(get(handles.vol2,'Value'));
```

```
axes(handles.axes2);
```

```
wave_select2= (get(handles.wave_sel_oscl2,'Value'));
```

```
switch wave_select2
```

```
    case 1
```

```
        plot (sin(t));
```

```
    case 2
```

```
        plot (sawtooth(t, 0.5));
```

```
    case 3
```

```
        plot (sawtooth(t));
```

```
    otherwise
```

```
        plot (square(t));
```

```
end;
```

```
axis off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%OSCILLATOR 3%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
phase3= 2*pi*get(handles.phase3,'Value');
```

```
oct3= str2double(get(handles.oct_sel3,'String'));
```

```
B3= Modulation_gain*(get(handles.vol3,'Value'));
```

```
axes(handles.axes3);

wave_select3= (get(handles.wave_sel_osc3,'Value'));
switch wave_select3

    case 1
        plot (sin(t));
    case 2
        plot (sawtooth(t, 0.5));
    case 3
        plot (sawtooth(t));

    otherwise
        plot (square(t));
end;
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%OSCILLATOR 4%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

phase4= 2*pi*get(handles.phase4,'Value');
oct4= str2double(get(handles.oct_sel4,'String'));
B4= Modulation_gain*(get(handles.vol4,'Value'));
axes(handles.axes4);
wave_select4= (get(handles.wave_sel_osc4,'Value'));
switch wave_select4

    case 1
        plot (sin(t));
    case 2
        plot (sawtooth(t, 0.5));
    case 3
        plot (sawtooth(t));

    otherwise
        plot (square(t));
end;
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%CALCULATE WAVEFORM%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
L=0:0.01:1000;

switch wave_select4
    case 1
        wave4 = sin(oct4*2.*pi.*L + phase4);
    case 2
        wave4 = sawtooth(oct4*2.*pi.*L + phase4, 0.5 );
    case 3
        wave4 = sawtooth(oct4*2.*pi.*L + phase4);

    otherwise
        wave4 = square(oct4*2*pi.*L + phase4);
end;
```

```
switch wave_select2
case 1
    wave3 = sin(oct3*2.*pi.*L + B4*wave4 + phase3);
case 2
    wave3 = sawtooth(oct3*2.*pi.*L + B4*wave4+ phase2, 0.5 );
case 3
    wave3 = sawtooth(oct3*2.*pi.*L +B4*wave4 + phase3);

otherwise
    wave3 = square(oct3*2.*pi.*L + B4*wave4+ phase3);
end;

switch wave_select2
case 1
    wave2 = sin(oct2*2.*pi.*L + B3*wave3 + phase2);
case 2
    wave2 = sawtooth(oct2*2.*pi.*L + B3*wave3+ phase2, 0.5 );
case 3
    wave2 = sawtooth(oct2*2.*pi.*L + B3*wave3 + phase2);

otherwise
    wave2 = square(oct2*2.*pi.*L + B3*wave3 + phase2);
end;

switch wave_select1

case 1
    wavel = sin(oct1*2*pi.*L + B2*wave2 + phase1);
case 2
    wavel = sawtooth(oct1*2*pi.*L + B2*wave2+ phase1, 0.5);
case 3
    wavel = sawtooth(oct1*2*pi.*L + B2*wave2+ phase1);

otherwise
    wavel = square(oct1*2*pi.*L + B2*wave2+ phase1);
end;

%PRINT SIGNAL
axes(handles.chart);
plot(wavel(1:314));
%PRINT SPECTRUM

axes(handles.spectrum_axes);
Spectrum = abs(fft (wavel));
semilogx(Spectrum(1:round(length(Spectrum)/2)));
m=max(Spectrum(1:round(length(Spectrum)/2)));
axis([900 100000 0 m]);
```