PWL_NSM_Stock

```
*    OUT     Rload
*   _____/\
*   |      \/
*  _|_       \
* /     \
* /VpwlT\           www.idea2ic.com dsauersanjose@aol.com  5/2/08
* \     /
*  \___/         |
*   _|_         7/7
*   |           Gnd
*
*  7/7
*  Gnd
*
* VpwlT OUT  0 PWL(        <== Format for piecewise linear file is as so.
* + 0       0.38156547       Random Noise is NSM stock prices vs year
* + 1.00E-06 0.60066694              Map 1year = 1sec_y
* ........etc...........    The step = 1 week  =1/52s_y = 26Hz_y Nyquist
* + 0.000003 0.944365605      The total measurement time is 2year which
* + 5.16E-04 0.658730205      corresponds to a .5Hz_y resolution
* + )
* This text file is located at the following
* Users/donsauer/Documents/MacSpice/Noise_NSM.txt
* .tran  TSTEP  TSTOP  TSTART TMAX   ?UIC?
* .tran  1m     2s     0s     1m            resample at 500Hz
*  linearize                               interpolate weekly data to 500Hz
*  spec   startf stopf  stepf   vector      [vector ...]
*  spec   .5     500    .5      v(NSM)       spec  .5Hz->500Hz   @.5Hz steps
*======== ====== ====== ====== ====== ====== ====== ====== ====== ====== ======

Rload     NSM    0      1k
.include  Noise_NSM.txt
.tran     1m     2      0      1m

*=========DO_AN_FFT_ON_YOUR_COMPANY_STOCK=====
.control
run
plot      NSM

linearize
set       specwindow =     "blackman"
spec      .5      500  .5     v(NSM)
plot      db(v(NSM))
plot      db(v(NSM))  xlimit 0 104
plot      db(v(NSM))  xlog
.endc
.end


*==========END_OF_SPICE===============

1) Let 1year        = 1  sec
   a) 1year cycle = 1  Hz_yr
   b) 1month      = 12 Hz_yr
2) Look over 2years
   a) bin resolution is 0.5/Hz_yr
3) Sample weekly (52 times a year)
   a) Nyquist      = 26 Hz_y (fortnight)
4) Resample and linearize at 1msec_yr
   a) .tran 1m 2 0 1m
   b) linearize
   c) spec .5 500 .5 v(NSM)
```

Graph 15 – tran18: PWL_NSB

V — NSM

Note that time is going backwards.

Graph 6 – spect6: PWL_NSM_Stock

dB — db(v(NSM))
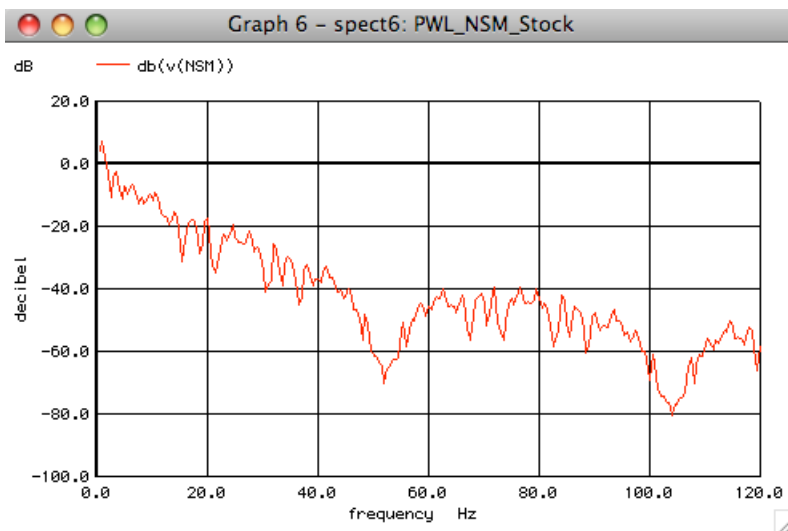
Nyquist is at 26Hz_yr (fornight)
    Sprectrum from 0 to 26Hz_yr is real
Minimums at 52Hz_yr and 104Hz_yr
    The even harmonics of Nyquist are attenutated
    Suggests linearization is symmetrical
The Spectrum mirror imaging with itself
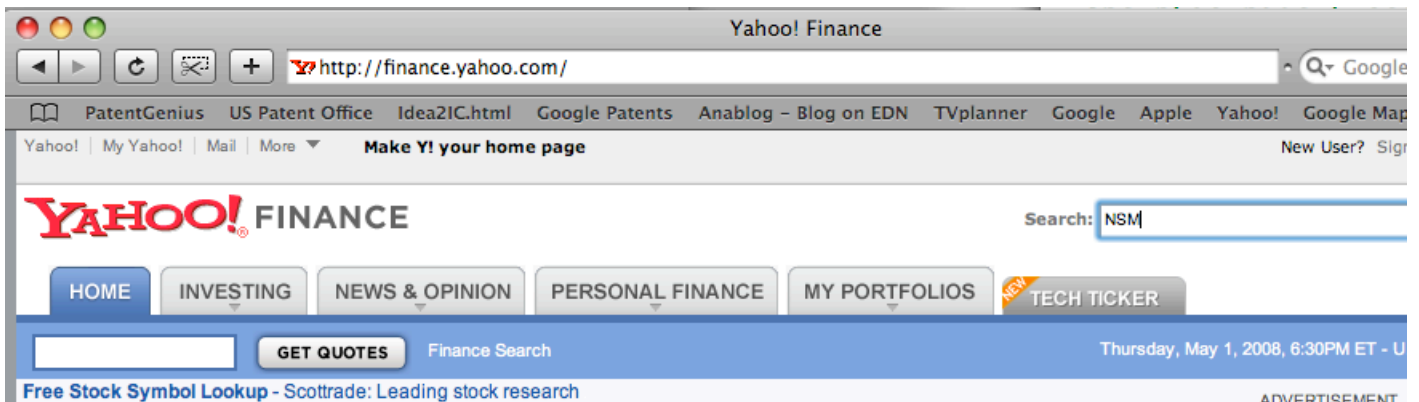   **52->76 is mirror of 76->104 etc**

Graph 16 – spect20: PWL_NSB

dB — db(v(NSM))
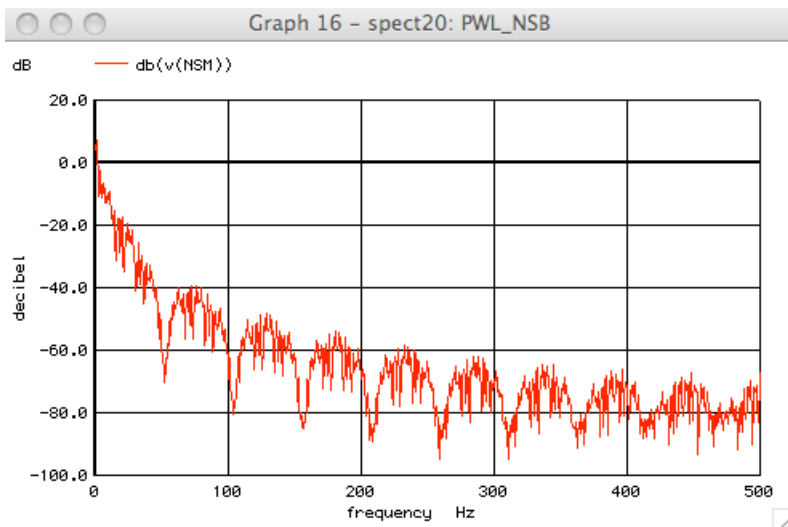
Signal below 26Hz_yr is real.
Above 26Hz_yr are linearization artifacts.
Low even harmonics means symmetry
Mirroring is typical for aliasing.
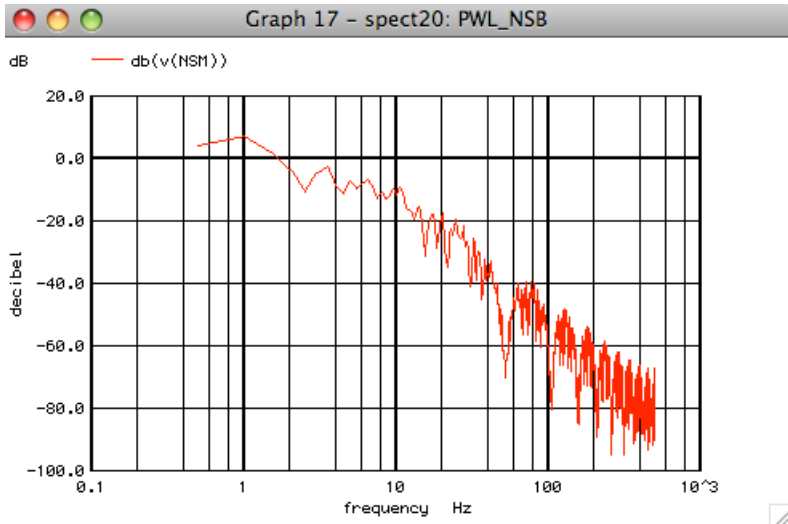
Stock is very much like 1/F noise.
It may look like it has a cycle to it.

========How_to_Import_Stock_Data_to_PWL_Files==============

1) Go Online

National Semiconductor Corp. (NSM)

More On NSM

Quotes
▶ Summary
Options
Historical Prices

Charts
Interactive
Basic Chart
Basic Tech. Analysis

News & Info
Headlines
Financial Blogs
Company Events
Message Board

Company
Profile
Key Statistics
SEC Filings
Competitors
Industry
Components

NATL SEMICONDUCTOR (NYSE: NSM)
After Hours: 21.20 0.00 (0.00%) as of 4:25PM ET on 05/01/08

Last Trade:	21.20	Day's Range:	20.37 - 21.25
Trade Time:	4:01PM ET	52wk Range:	16.21 - 29.69
Change:	↑ 0.81 (3.97%)	Volume:	5,673,820
Prev Close:	20.39	Avg Vol (3m):	6,276,790
Open:	20.50	Market Cap:	5.14B
Bid:	N/A	P/E (ttm):	17.79
Ask:	N/A	EPS (ttm):	1.19
1y Target Est:	22.21	Div & Yield:	0.24 (1.10%)

Quotes delayed, except where indicated otherwise. For consolidated real-time quotes (incl. pre/post market data), sign up for a free trial of Real-time Quotes.

2) Select Historical Price at weekly rate

National Semiconductor Corp. (NSM)
At 4:01P

MORE ON NSM

Quotes
Summary
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▶ Historical Prices

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Interactive
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Basic Tech. Analysis

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Competitors
Industry
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Analyst Coverage
Analyst Opinion
Analyst Estimates
Research Reports
Star Analysts

Ownership
Major Holders
Insider Transactions
Insider Roster

Financials

Historical Prices
Get Histo

SET DATE RANGE

Start Date: Jan ⬍ 4 1982 Eg. Jan 1, 2003
End Date: May ⬍ 1 2008

○ Daily
● Weekly
○ Monthly
○ Dividends Only

[Get Prices]

First | Prev | Next | Last

PRICES

Date	Open	High	Low	Close	Avg Vol	Adj Close*
28-Apr-08	20.90	21.22	20.23	20.39	4,515,200	20.39
21-Apr-08	20.41	21.25	19.62	20.83	6,311,500	20.83
14-Apr-08	19.72	20.93	19.25	20.55	5,272,600	20.55
7-Apr-08	19.87	20.81	19.05	19.78	6,066,900	19.78
31-Mar-08	18.08	19.87	18.08	19.69	5,820,000	19.69
24-Mar-08	18.30	19.39	18.06	18.11	5,898,400	18.11
17-Mar-08	17.64	19.21	17.58	18.24	7,438,300	18.24
13-Mar-08			$ 0.06 Dividend			
10-Mar-08	18.10	18.89	17.76	18.04	8,380,200	18.04
3-Mar-08	16.42	18.58	16.21	18.25	9,787,200	18.19
25-Feb-08	17.36	17.90	16.41	16.47	4,863,900	16.42

3) Download in spread sheet format

29-Jan-07	23.14	23.74	22.43	23.63	3,683,400	23.39
26-Jan-07	22.92	23.45	22.75	23.21	4,465,500	22.97

* Close price adjusted for dividends and splits.

First | Prev | Next | Last

Download To Spreadsheet

Add to Portfolio   Set Alert   Email to a Friend

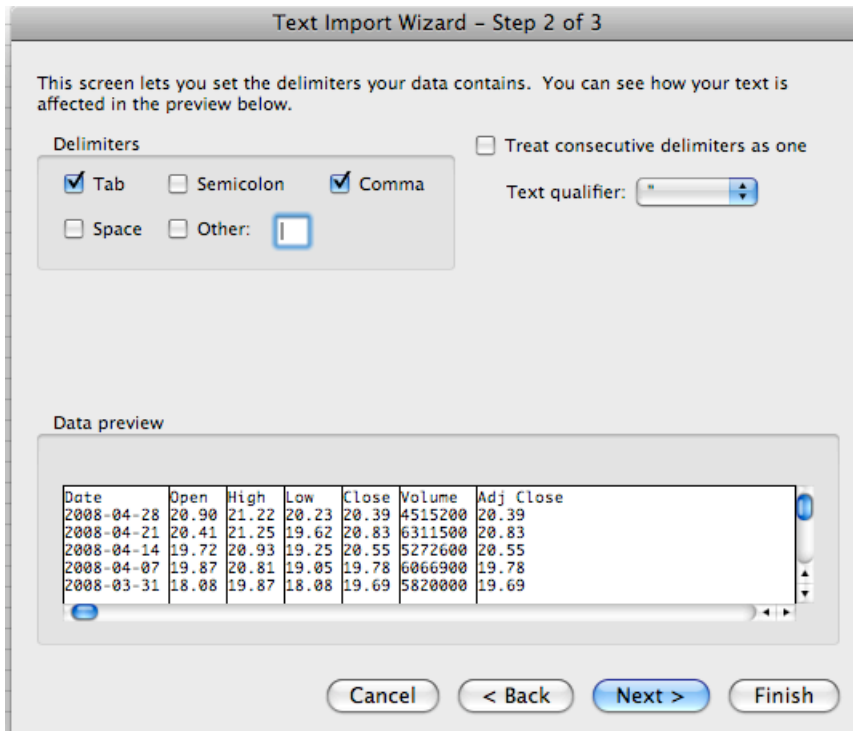Get **Historical Prices** for Another Symbol: [   ] (GO) Symbol Lookup

- Stock Screener   • Splits
- Mergers & Acquisitions

4) May have to add a ".txt" for "New Excel"

5) The usual Delimiters

Text Import Wizard – Step 2 of 3

This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.

Delimiters

☑ Tab   ☐ Semicolon   ☑ Comma
☐ Space   ☐ Other: |

☐ Treat consecutive delimiters as one

Text qualifier: ["]

Data preview

```
Date       Open  High  Low   Close Volume  Adj Close
2008-04-28 20.90 21.22 20.23 20.39 4515200 20.39
2008-04-21 20.41 21.25 19.62 20.83 6311500 20.83
2008-04-14 19.72 20.93 19.25 20.55 5272600 20.55
2008-04-07 19.87 20.81 19.05 19.78 6066900 19.78
2008-03-31 18.08 19.87 18.08 19.69 5820000 19.69
```

Cancel   < Back   Next >   Finish

6) Copy as such for a Y column

table.csv.txt

Font Color Increase Fo... Decrease F... Fill Color Borders Normal Spi

rt ▾ Format ▾ Tools ▾ Chart ▾ Window ▾ Help ▾ Formula Bar

Sheets   Charts   SmartArt Graphics   W

	G	H	I	J	K	
	Adj Close					
15200	20.39				=G2	
11500	20.83					
72600	20.55					
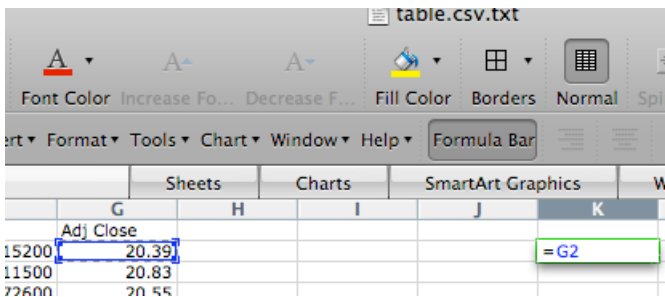
7) Calibrate a X column to 1year

ase F... Fill Color Borders Normal Spir

ndow ▾ Help ▾ Formula Bar

Charts   SmartArt Graphics   Wo

I	J	K
	0	20.39
	=J2+1/52	20.83
		20.55
		19.78
		19.69
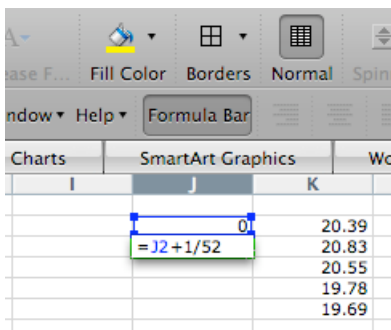
8) Precede with a '+ text column

I	J	K
'+	0	20.39
	0.01923077	20.83
	0.03846154	20.55
	0.05769231	19.78
	0.07692308	19.69

9) Extend down to desired number of years

	J	K
+	0	20.39
+	0.01923077	20.83
+	0.03846154	20.55
+	0.05769231	19.78
+	0.07692308	19.69
+	0.09615385	18.11
+	0.11538462	18.24
+	0.13461538	18.04
+	0.15384615	18.19
+	0.17307692	16.42
+	0.19230769	17.2
+	0.21153846	17.11
+	0.23076923	17.34
+	0.25	19.3
+	0.26923077	18.2
+	0.28846154	19.31
+	0.30769231	19.74
+	0.32692308	20.97
+	0.34615385	22.64
+	0.36538462	23.3
+	0.38461538	23.67
+	0.40384615	24.39
+	0.42307692	22.73
+	0.44230769	22.23
+	0.46153846	22.42
+	0.48076923	23.27
+	0.5	25.08
+	0.51923077	24.81
+	0.53846154	25.86
+	0.55769231	26.39
+	0.57692308	26.89
+	0.59615385	26.96
+	0.61538462	26.28
+	0.63461538	25.28
+	0.65384615	25.57
+	0.67307692	26.13
+	0.69230769	26.65
+	0.71153846	25.08
+	0.73076923	25.02
+	0.75	25.17
+	0.76923077	25.85
+	0.78846154	27.53
+	0.80769231	28.82
+	0.82692308	28.61
+	0.84615385	28.06
+	0.86538462	27.67
+	0.88461538	28.31
+	0.90384615	29.32
+	0.92307692	26.46
+	0.94230769	25.84
+	0.96153846	26.38
+	0.98076923	27.55
+	1	27.16

10) Cut and paste into a text editor
11) Convert all tabs to 5 spaces

```
                              untitled 4
+      0     20.39
+      0.019230769     20.83
+      0.038461538     20.55
+      0.057692308     19.78
+      0.076923077     19.69
+      0.096153846     18.11
+      0.115384615     18.24
+      0.134615385     18.04
+      0.153846154     18.19
+      0.173076923     16.42
+      0.192307692     17.2
+      0.211538462     17.11
+      0.230769231     17.34
+      0.25  19.3
+      0.269230769     18.2
+      0.288461538     19.31
+      0.30769
+      0.32692
+      0.34615
+      0.36538
+      0.38461
+      0.40384
+      0.42307
+      0.44230
+      0.46153
+      0.48076
+      0.5   25
+      0.51923
+      0.53846
+      0.55769
+      0.57692
+      0.59615
+      0.61538
+      0.63461
+      0.65384
+      0.67307
+      0.69230
+      0.71153
+      0.73076
+      0.75  25
+      0.76923
+      0.78846
+      0.80769
+      0.82692
+      0.846153846     28.06
+      0.865384615     27.67
+      0.884615385     28.31
+      0.903846154     29.32
+      0.923076923     26.46
+      0.942307692     25.84
+      0.961538462     26.38
+      0.980769231     27.55
+      1     27.16
```

Find & Replace

Find the text: `^t`

Replace with:

- ☐ Regular expression (grep).   Grep Symbols
- ☐ Cases must match.
- ☐ Whole words only.   (CR)   (Wild)
- ☐ Begin search at cursor.   (Tab) (Wild Run)
- ☐ Search selection only.   (LF)   (FF)
- ☐ Search all open documents.   [ASCII]

(Replace All)   (Count)   (Cancel)   (**Find**)

A 1013   53-9

12) Add a PWL_header/PWL_end and save as a PWL file.

```
Vpwl_NSM   NSM 0 PWL(
+     0     20.39
+     0.019230769    20.83
+     0.038461538    20.55
+     0.057692308    19.78
+     0.076923077    19.69
+     0.096153846    18.11
+     0.115384615    18.24
+     0.134615385    18.04
+     0.153846154    18.19
+     0.173076923    16.42
+     0.192307692    17.2
+     0.211538462    17.11
+     0.230769231    17.34
+     0.25 19.3
+     0.269230769    18.2
+     0.288461538    19.31
+     0.307692308    19.74
+     0.326923077    20.97
+     0.346153846    22.64
+     0.365384615    23.3
+     0.384615385    23.67
+     0.403846154    24.39
+     0.423076923    22.73
+     0.442307692    22.23
+     0.461538462    22.42
+     0.480769231    23.27
+     0.5   25.08
+     0.519230769    24.81
+     0.538461538    25.86
+     0.557692308    26.39
+     0.576923077    26.89
+     0.596153846    26.96
+     0.615384615    26.28
+     0.634615385    25.28
+     0.653846154    25.57
+     0.673076923    26.13
+     0.692307692    26.65
+     0.711538462    25.08
+     0.730769231    25.02
+     0.75 25.17
+     0.769230769    25.85
+     0.788461538    27.53
+     0.807692308    28.82
+     0.826923077    28.61
+     0.846153846    28.06
+     0.865384615    27.67
+     0.884615385    28.31
+     0.903846154    29.32
+     0.923076923    26.46
+     0.942307692    25.84
+     0.961538462    26.38
+     0.980769231    27.55
+     1     27.16
+ )
```

A 1038   55-3

13) Put it where spice can include it.