User Defined Functions

User Defined Functions are perhaps one of the most useful tools available to reduce the amount of data displayed in the report and/or to show the data in a more functional form. The better stock screening programs allow Used Defined Functions to be used as criteria

Some are highlighted here:

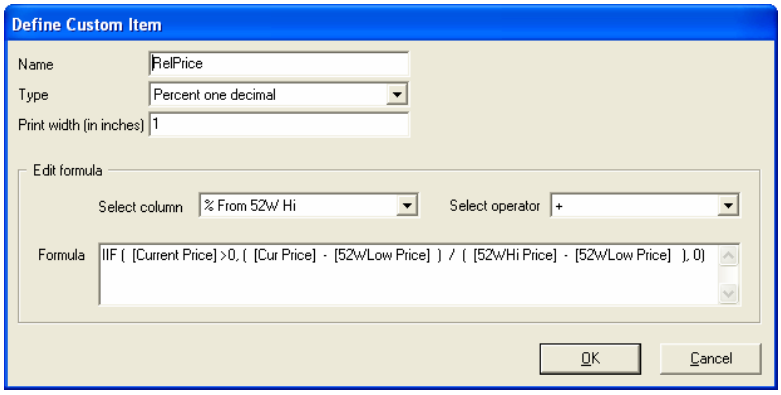
1. Relative Price
2. Desired Growth
3. Price Volatility

Relative Price

Relative Price is expressed as the percentage of where the current price of a stock is within the range of its 52 week high to 52 week low.

$$\text{Rel Price} = \frac{(\text{Price} - 52\text{ Wk Low})}{(52\text{ Wk High} - 52\text{ Wk Low})} * 100$$

$$\text{Rel Price} = \frac{(54 - 48)}{(64 - 48)} * 100 = \frac{6}{16} * 100 = 37.5\%$$



The use of Relative Price in a report precludes the need for a listing of the Current Price, the 52 Week High Price, and the 52 Week Low Price.

The equation to use in Prospector is

```
IIF ( [Current Price] >0, ( [Cur Price] - [52WLow Price] ) / ( [52WHi Price] - [52WLow Price] ), 0)
```

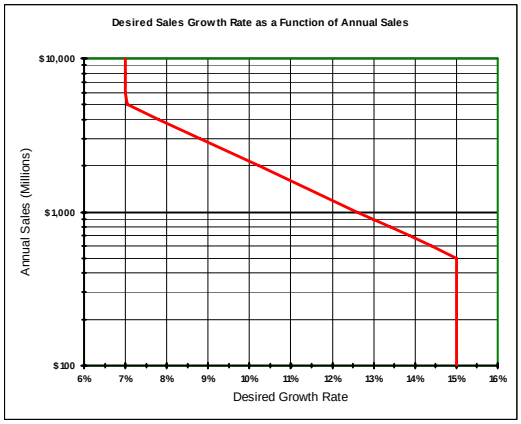
Desired Growth

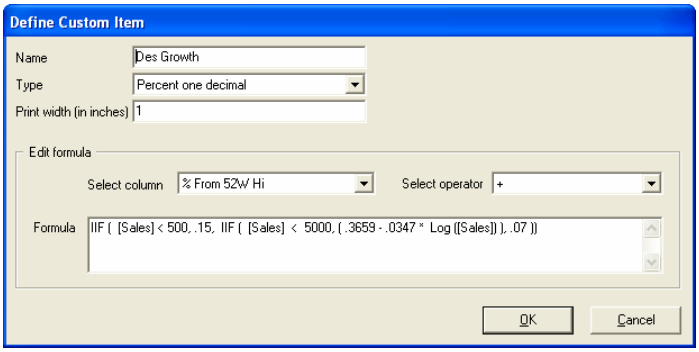
Desired Growth is the growth that we expect out of a company based on its size as defined by Capitalization or Sales (aka: Revenue). As Sales are more stable over time than is Capitalization, the following is based on Sales.

For the purposes of this exercise we will define Small Capitalization Companies to have Annual Sales less than $500 million, Large Capitalization Companies to have

Annual Sales greater than $5 billion, and Mid Capitalization Companies as the rest with Sales between $500 million and $5 billion.

Based on this there will be a spread of approximately 25% Small-Cap, 50% Mid-Cap, and 25% Large-Cap. Statistically this spread is for both Sales and Capitalization.





The equation to use in Prospector is

```
IIF ( [Sales] < 500, .15, IIF ( [Sales] < 5000, ( .3659 - .0347 * Ln ([Sales]) ), .07 ))
```

Notes:

1. While NAIC looks for a Total Annual Return on our investment to be 15% or greater, it should be remembered that we do not need to see 15% for growth in Sales and Earnings. Large companies are not able to maintain a 15% growth in Sales, yet they meet our overall expectations and provide for a stable base to our portfolios.
2. The "IIF" is a logical Immediate IF operator.
3. These same equations for Relative Price and Desired Growth may be used as Criteria in our Value Line Screens, however, Value Line uses the Log_{10} (Log base 10) function while Prospector uses Ln_e (Log base e). The coefficients for slope and intercept are summarized below.

Program	Slope (m)	Intercept (b)
Value Line	-0.08	0.366
Prospector	-0.0347	0.3659

Price Volatility

We all know what Beta is but to review…

> **Beta:** A quantitative measure of the volatility of a given stock, mutual fund or portfolio relative to the overall market. A beta above 1 is more volatile than the overall market, while a beta below 1 is less volatile.

I have learned from experience that a Beta greater than 1.4 could be dangerous. What I don't know is much more than that, e.g., period of time used for its determination, a safe range.

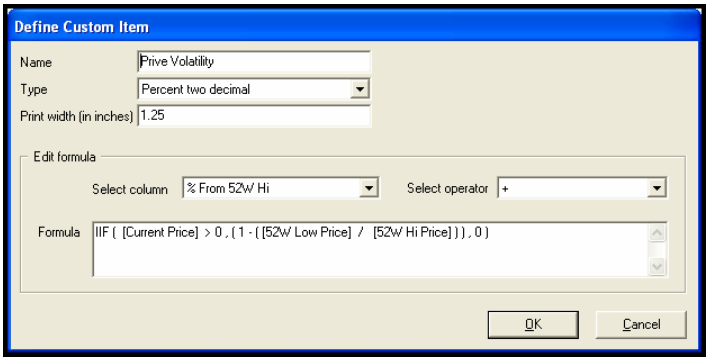
I feel that a new measure using data and tools available to us could be helpful. Let us call this Price Volatility. It could be defined by the magnitude of the price swing from either yearly High to Low or by the 52 week High to Low.

Mathematically:

> **Price Volatility = 1 – Yearly Low / Yearly High expressed as a percentage.**

$$\text{Price Volatility} = 1 - \frac{[52\text{ Wk Low}]}{[52\text{ Wk High}]}$$

$$\text{Price Volatility} = 1 - \frac{48}{64} = 1 - 0.75 = 0.25 = 25\%$$



The use of Price Volatility along with Relative Price in a report precludes the need for a listing of the Current Price, the 52 Week High Price, and the 52 Week Low Price.

The equation to use in Prospector is

```
IIF ( [Current Price] > 0, ( 1 - [52WLow Price] / ( [52WHi Price] ), 0 )
```

Examples (Using 52 Week Highs and Lows:

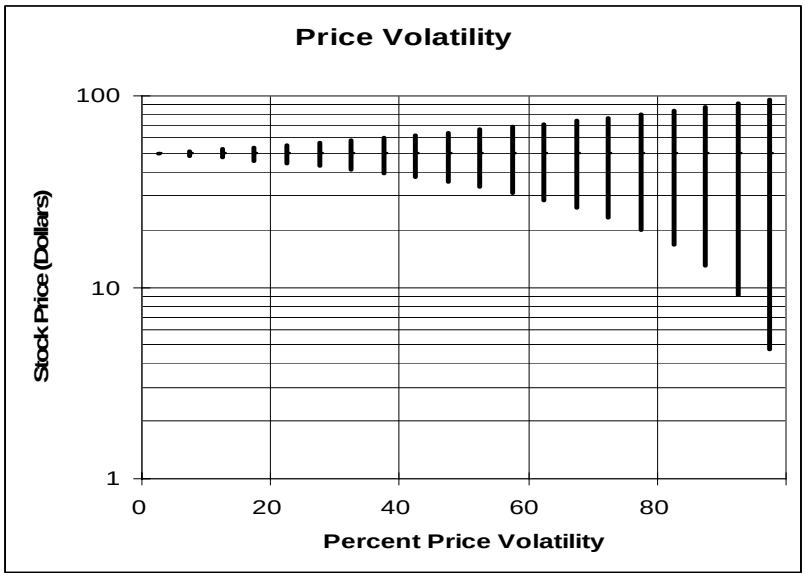
Ticker	High Price 52 Week	Low Price 52 Week	% Vol
JNJ	$ 66.89	$ 49.25	26%
LNCR	$ 43.33	$ 28.45	34%
PFE	$ 31.97	$ 21.99	31%
SYK	$ 57.66	$ 40.30	30%
UTSI	$ 35.66	$ 12.59	65%

Examples (Using yearly data from Toolkit ASCII data print to file):

Johnson & Johnson (JNJ)			
Year	**High Price 52 Week**	**Low Price 52 Week**	**% Vol**
1994	$ 14.13	$ 9.00	36%
1995	$ 23.09	$ 13.41	42%
1996	$ 27.00	$ 20.78	23%
1997	$ 33.66	$ 24.31	28%
1998	$ 44.88	$ 31.69	29%
1999	$ 53.44	$ 38.50	28%
2000	$ 52.97	$ 33.06	38%
2001	$ 60.97	$ 40.25	34%
2002	$ 65.89	$ 41.40	37%
2003	$ 59.08	$ 48.05	19%

UTStarcom (UTSI)			
Year	**High Price 52 Week**	**Low Price 52 Week**	**% Vol**
2000	$ 93.50	$ 12.31	87%
2001	$ 31.43	$ 12.50	60%
2002	$ 35.66	$ 12.21	66%
2003	$ 46.45	$ 16.57	64%

A plot showing High/Low Bars for the range of Price Volatilities:



Appendix I shows the data for this plot. Examine the price swings for achievement of the higher percent price volatilities.

Appendix II shows various percent Price Volatility Bars on an SSG Visual Analysis chart.

Summary Comments:

Identifying volatile price swing years will also show times of higher High PEs and lower Low PEs. We tend to discard the High PEs but neglect to discard the low ones in the same year.

Appendix I

High Price 52 Week	Low Price 52 Week	Close	Price Volatility
$ 50.00	$ 50.00	$ 50.00	0%
$ 51.28	$ 48.72	$ 50.00	5%
$ 52.63	$ 47.37	$ 50.00	10%
$ 54.05	$ 45.95	$ 50.00	15%
$ 55.56	$ 44.44	$ 50.00	20%
$ 57.14	$ 42.86	$ 50.00	25%
$ 58.82	$ 41.18	$ 50.00	30%
$ 60.61	$ 39.39	$ 50.00	35%
$ 62.50	$ 37.50	$ 50.00	40%
$ 64.52	$ 35.48	$ 50.00	45%
$ 66.67	$ 33.33	$ 50.00	50%
$ 68.97	$ 31.03	$ 50.00	55%
$ 71.43	$ 28.57	$ 50.00	60%
$ 74.07	$ 25.93	$ 50.00	65%
$ 76.92	$ 23.08	$ 50.00	70%
$ 80.00	$ 20.00	$ 50.00	75%
$ 83.33	$ 16.67	$ 50.00	80%
$ 86.96	$ 13.04	$ 50.00	85%
$ 90.91	$ 9.09	$ 50.00	90%
$ 95.24	$ 4.76	$ 50.00	95%

Appendix II