

Phil Erlanger Research Co., Inc.

www.quantpartners.com/erlanger



Specializing in Sentiment and Technical Analysis

Phil Erlanger Research Co. Inc.

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Our Philosophy

Phil Erlanger Research provides advanced technical analysis research and data to the corporate and institutional financial community. State-of-the-art computational techniques are combined with important, proprietary market data, enabling Phil Erlanger Research to offer independent, value-added data and analysis on over 6000 equity issues, 139 industry groups and 18 sectors.

Phil Erlanger:

- Advest's Chief Technical Analyst
- Senior Technical Analyst for Fidelity Management & Research Co.
- President of The Market Technicians Association

Value Added Independent Research:

- **Stock Selection**
 - Generate Ideas
 - Timing Moves
- **Portfolio Construction & Monitoring**
 - Manage Market Exposure
 - Sector & Group Weighting
- **Valuable Alternative Perspective**
 - Monitor Shorts and Options
 - User-friendly Technical Analysis

Our philosophy is as simple as it is effective. To identify an excess of sentiment regarding investor opinion on stocks and to measure the market's concurrence with said sentiment. *Who is right about a particular stock, group or sector - the Bulls or the Bears?* Our experience suggests that by answering this question, investors can not only uncover opportunities otherwise unseen, but also can avoid the pitfalls of following too big a crowd. By using this strategy, our clients add value to their portfolio decision-making process.

Our Data:

Short Interest:

- **Short Interest Ratio (days to cover)**

Short interest data is normalized by dividing current short interest by one-month average daily volume (this is known as the short interest ratio). Phil Erlanger Research divides current short interest by 12-month average daily volume - this gives us a truer measure of short selling. We also split adjust our historical data.

- **Short Intensity Rank**

Normalized Short Interest Ratio by taking the latest value, and then calculate that ratio's position within the range of short ratios over the past five (5) years.

Technical Rank

The Erlanger Technical Rank, available daily on over 5000 issues via our Erlanger 2000 product, is a normalized expression of relative strength.

Power Rank

The Erlanger Power Rank is a combination of the Technical Rank (our measure of relative strength) and the Short Rank (our measure of short selling intensity).

Type Classifications

Use the Erlanger Type Classifications to Buy, Hold, Sell and Sell Short stocks

Type 1 = Short Squeezes Type 2 = Recognized strength

Type 3 = Short sellers are right Type 4 = Long Squeeze

Options Data:

- **Put/Call and Call/Put Ratios**

Erlanger Research measures are designed to highlight those times *bearish and bullish* expectations are excessive. Volume put/call ratios, open interest put/call ratios, and proprietary measure of volume weighted average premiums - Erlanger Premium Put/Call ratios are just a few included.

- **Erlanger Options Rank**

A composite variable that observes the excess sentiment and speculation on the part of equity options traders.

Short Interest:

There are few ways to measure sentiment on a stock-by-stock basis. Phil Erlanger Research has found normalized short selling statistics to be the only method for measuring investor expectations of individual stocks. We have compiled decades of short selling data that are unavailable elsewhere and performed techniques of normalization and interpretation so that our clients can for the first time determine the intensity of a stock's short selling activity.

Short Interest Ratio

The traditional calculation of "Days to Cover," but with a twist. The Erlanger Short Ratio is calculated using the same variables monthly number of shares short divided by the average daily volume. Erlanger uses a 12-month weighted average daily volume instead of the traditional 20 days. This allows a smoother calculation and avoids misleading ratios during volatile market conditions and individual anomalies like analyst recommendations and earnings reports. The Erlanger Short Ratio will change on a monthly basis as the new short interest numbers are released.



Short Intensity Rank

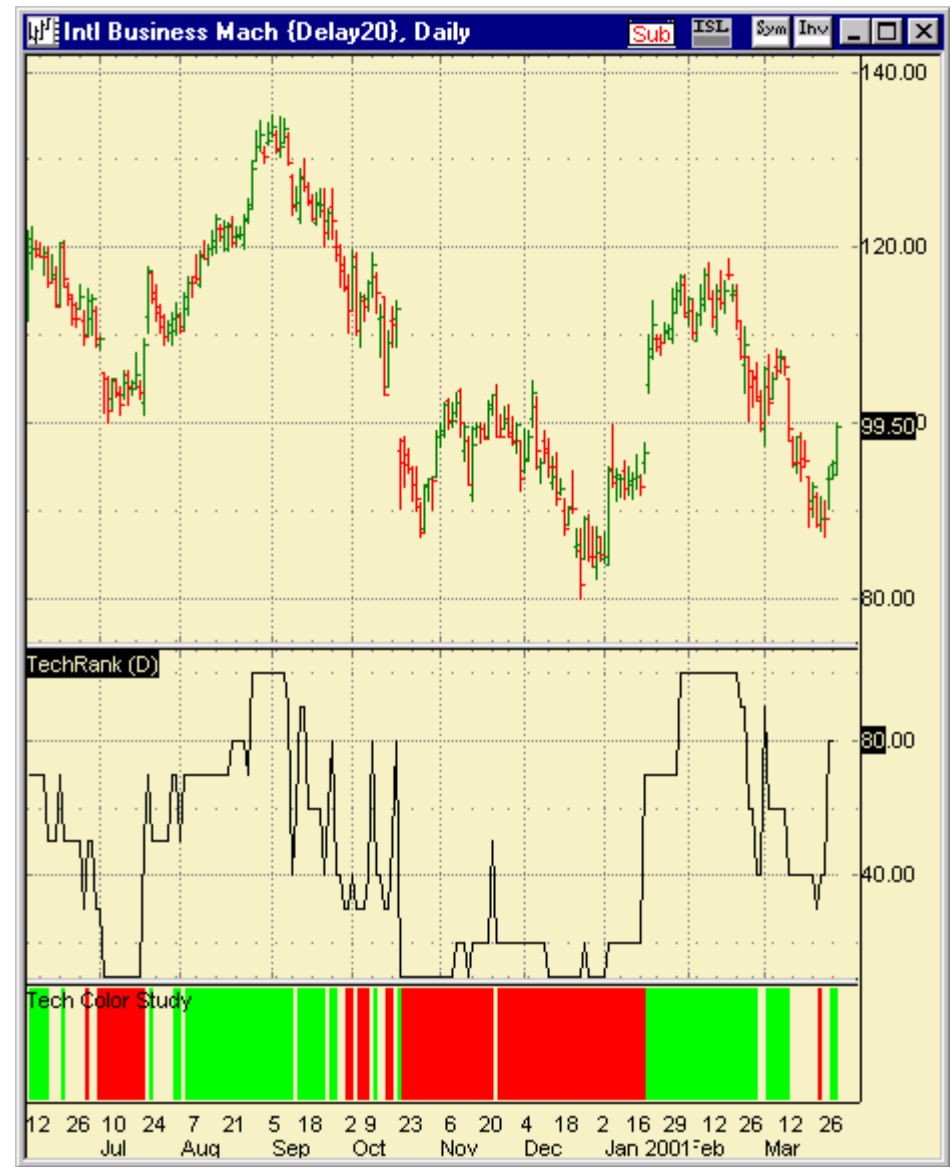
A weighted percentage from 100 to 0 of the current Erlanger Short Ratio relative to historical range. Erlanger research looks back historically from the current months to 5 years to gage the current "interest" in shorting the individual stock. A value of 100% represents a current level of shorting that is high relative to the historical number of shares short. A value of 0% represents a low level of short activity. A short intensity can only be compiled with at least six months of history. The Short Intensity should be used in conjunction with the Erlanger Short Ratio to gage the magnitude of short selling activity.

Technical Rank:

Phil Erlanger Research has developed a series of models that use modern pattern recognition techniques to identify the relative strength or weakness of a stock's price action against the S&P 500.

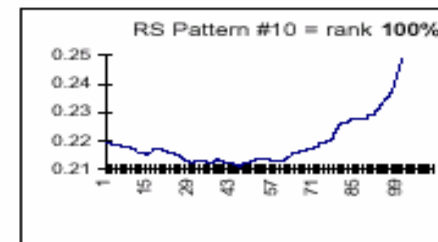
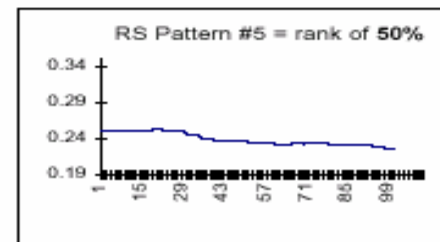
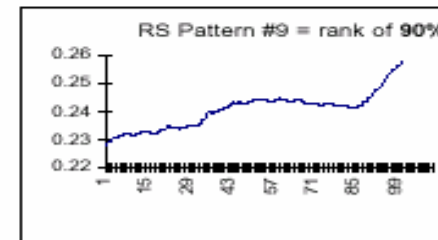
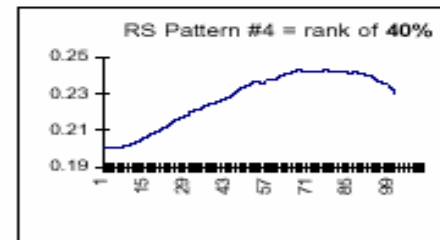
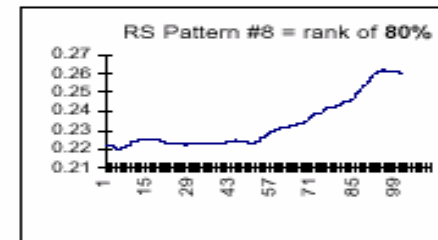
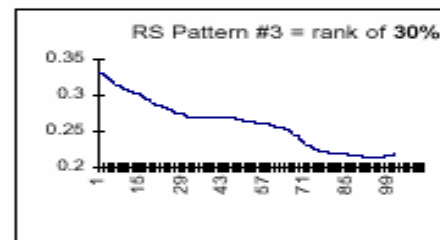
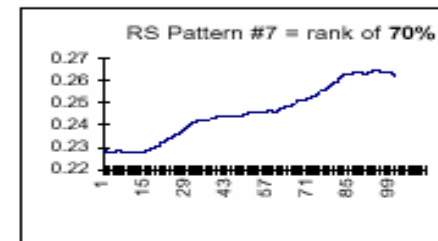
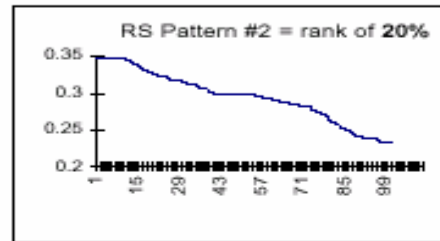
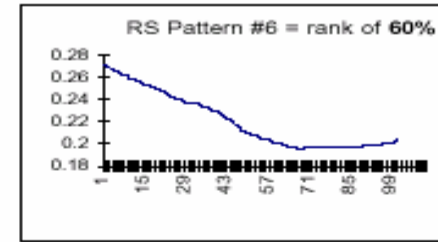
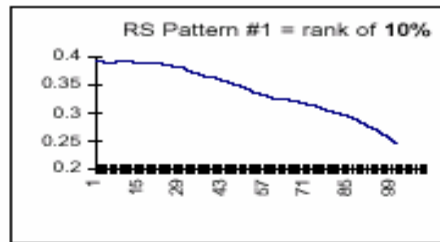
Variables used in the Technical Rank are the weighted average price moves for the last 100 trading days. This methodology generates a more accurate measure without an increase in signal volatility, making it superior to linear techniques such as slope or rate-of-change computations.

Ranking values utilizing the proprietary pattern recognition software classify stocks from 10 to 100 in increments of 10. Ranks of 60 or better are considered to be strong relative strength stocks while 30 and below are technically weak.



Technical Rank:

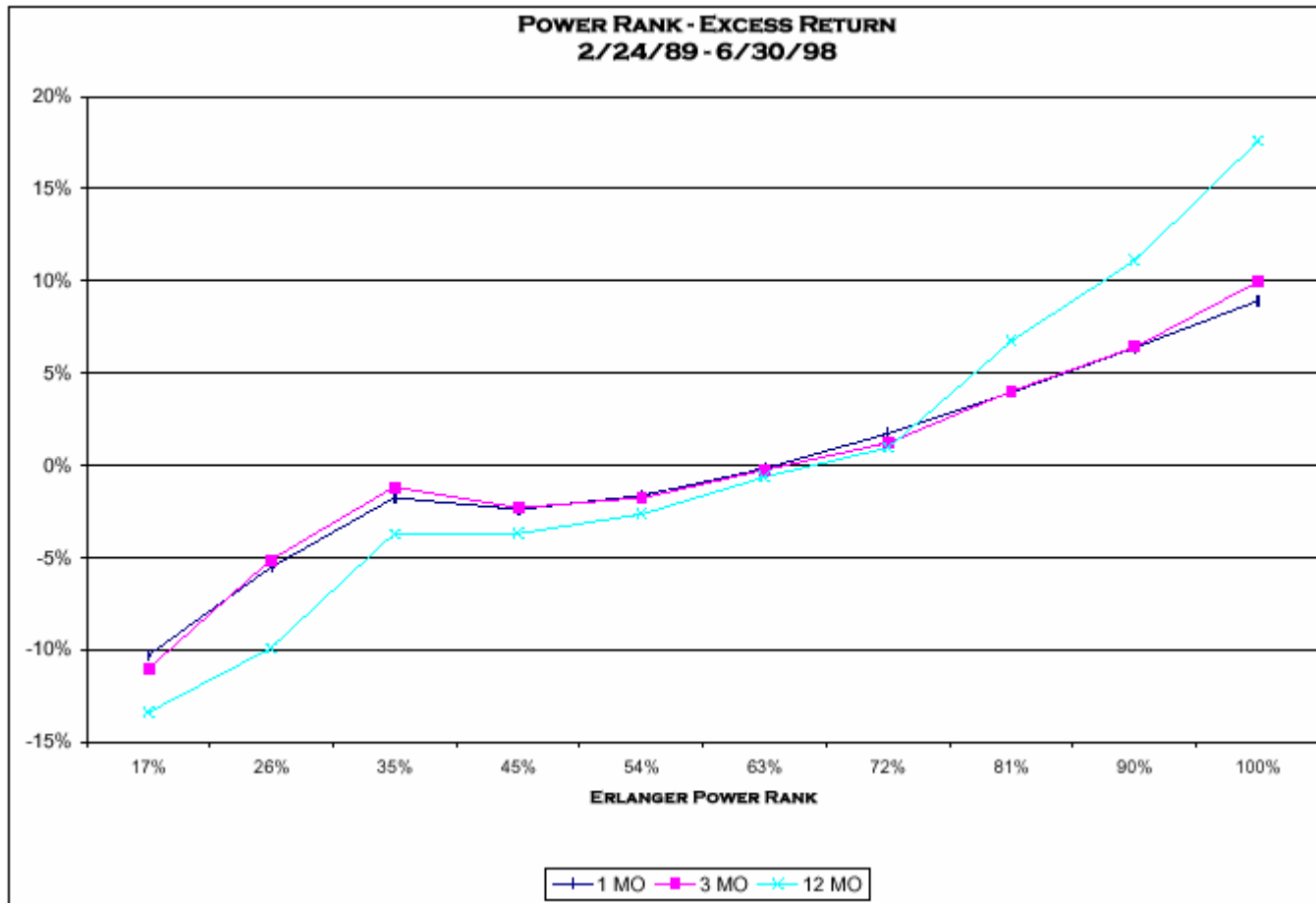
ERLANGER TECHNICAL RANKING Quantitative Recognition Of Relative Strength Patterns



Power Rank:

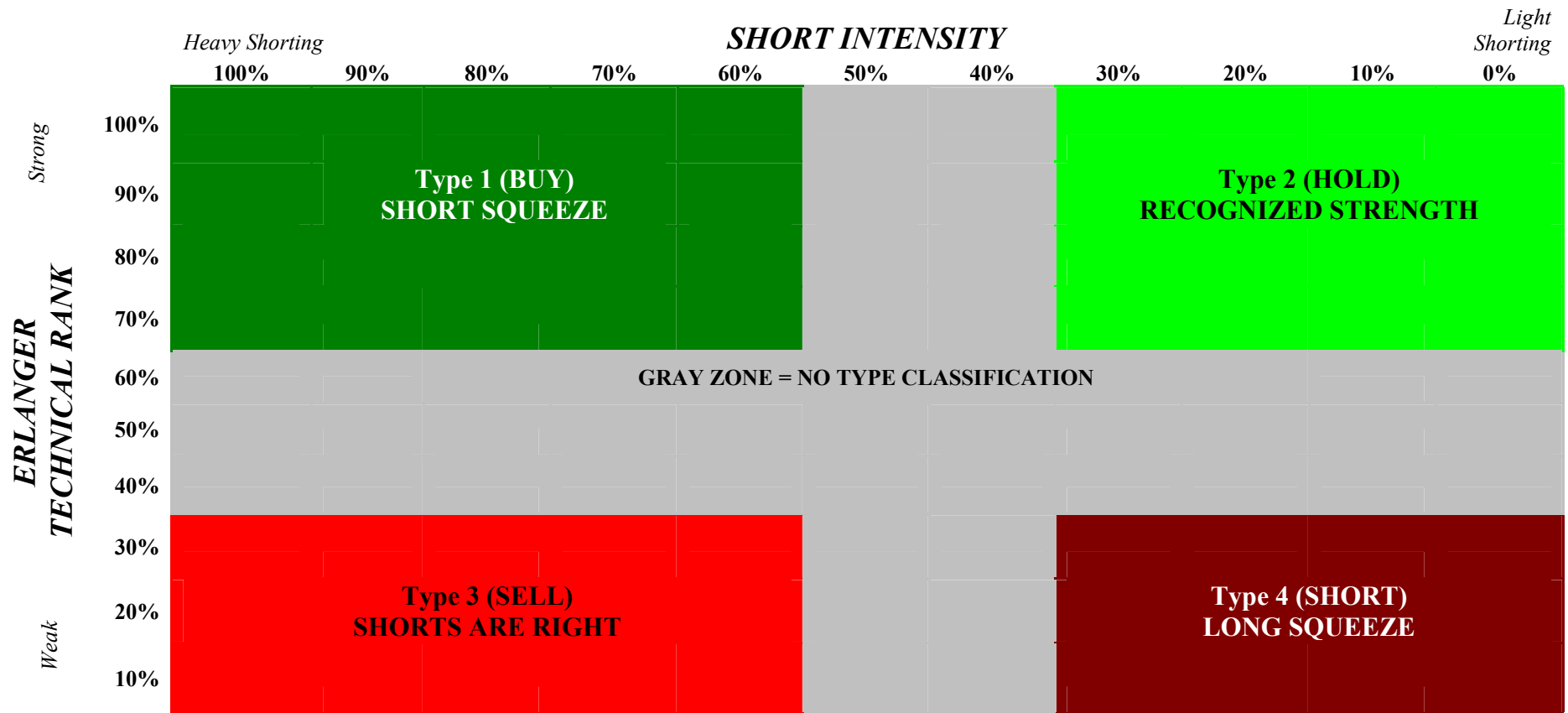
The Erlanger Power Rank is a combination of the Technical Rank (our measure of relative strength) and the Short Rank (our measure of short selling intensity). On a scale of 0% to 100%, a reading of 100% measures a situation when a stock has the strongest pattern of relative strength at a time when short selling is at a high for the past five years - a short squeeze situation. The higher the Power Rank, the greater the price is advancing against a heavier body of short sellers. The lower the Power Rank, the weaker the price is acting in a stock where fewer feel the desire to sell short - a long squeeze.

The following chart shows the annualized excess return for stocks by 10 fractiles of Power Rank (left to right x-axis is worst to best fractiles):



Based on performance measuring software, the graph shows the excess return (relative to the S&P 500) for the Power Rank broken up into deciles. The worst decile (17%) clearly underperformed the average even rebalancing only 12 months - but rebalancing every month clearly improved results. The best returns on a one month, three month and 12 month term was generated by stocks of the best Power Rank - 100%.

Type Classification:



Type Classification	Terminology	Recommendation	Criteria		
			Tech Rank	Short Intensity	Short Ratio
TYPE 1	Short Squeeze	Buy	≥ 70	≥ 60	≥ 1.5
TYPE 2	Recognized Strength	Hold	≥ 70	≤ 30	< 4
TYPE 3	Shorts Are Right	Sell	≤ 30	≥ 60	≥ 1.5
TYPE 4	Long Squeeze	Short	≤ 30	≤ 30	< 4

Options Data:



The 10-day Average Put/Call Erlanger Premium Ratio measures the volume weighted average price of a stock's put options versus the volume weighted average price of a stock's call options. The higher the ratio, the greater the overall value in put options. This is both a measure of sentiment as premiums expand, *but also a measure of momentum as, in this case, price declines bulge the value of put contracts*. Therefore, the greater the Put/Call Erlanger Premium Ratio, the greater the bearish sentiment and the greater the maturity of a price decline phase.

Conversely, the 10-day Average Call/Put Erlanger Premium Ratio measures the volume weighted average price of a stock's call options versus the volume weighted average price of a stock's put options. The higher the ratio, the greater the overall value in call options. This is both a measure of sentiment as premiums expand, *and a measure of momentum as, in this case, price advances bulge the value of call contracts*. Therefore, the greater the Call/Put Erlanger Premium Ratio, the greater the bullish sentiment and the greater the maturity of a price advance phase.

Erlanger Options Rank (Composite of Composites):

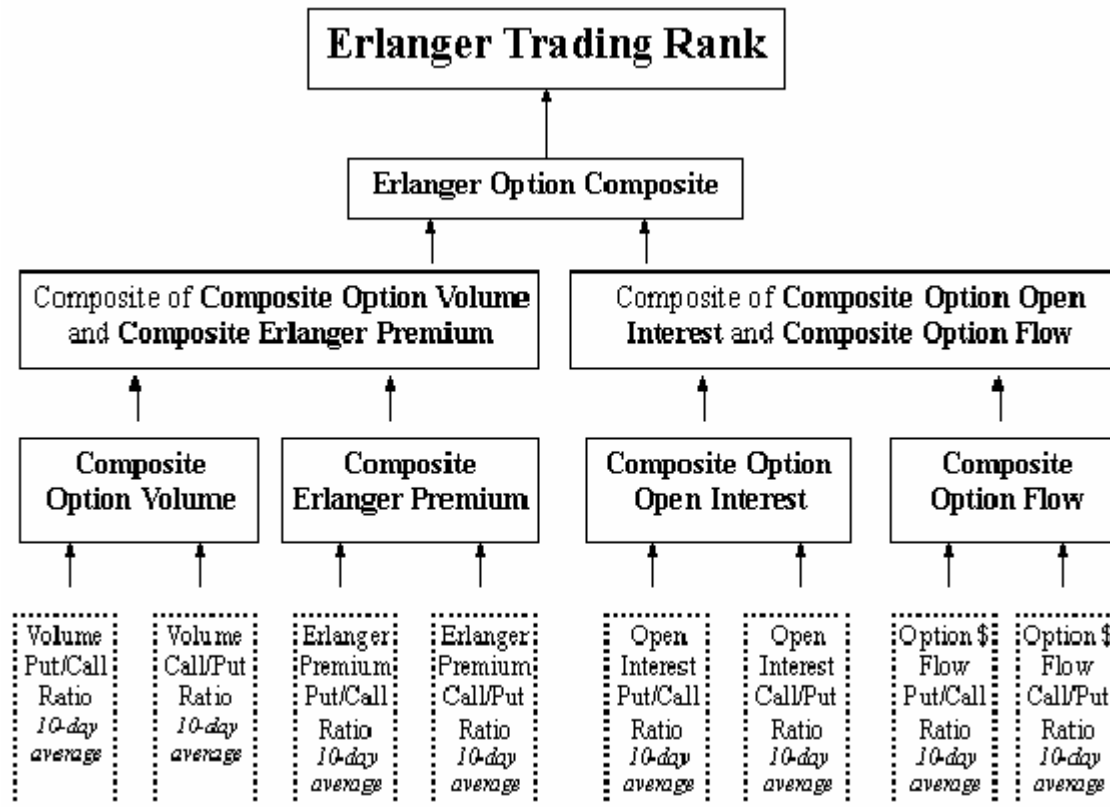
The Erlanger Options Rank is entirely a measurement of equity options trading.

The observations are stock-by-stock, and comprise daily trading elements such as:

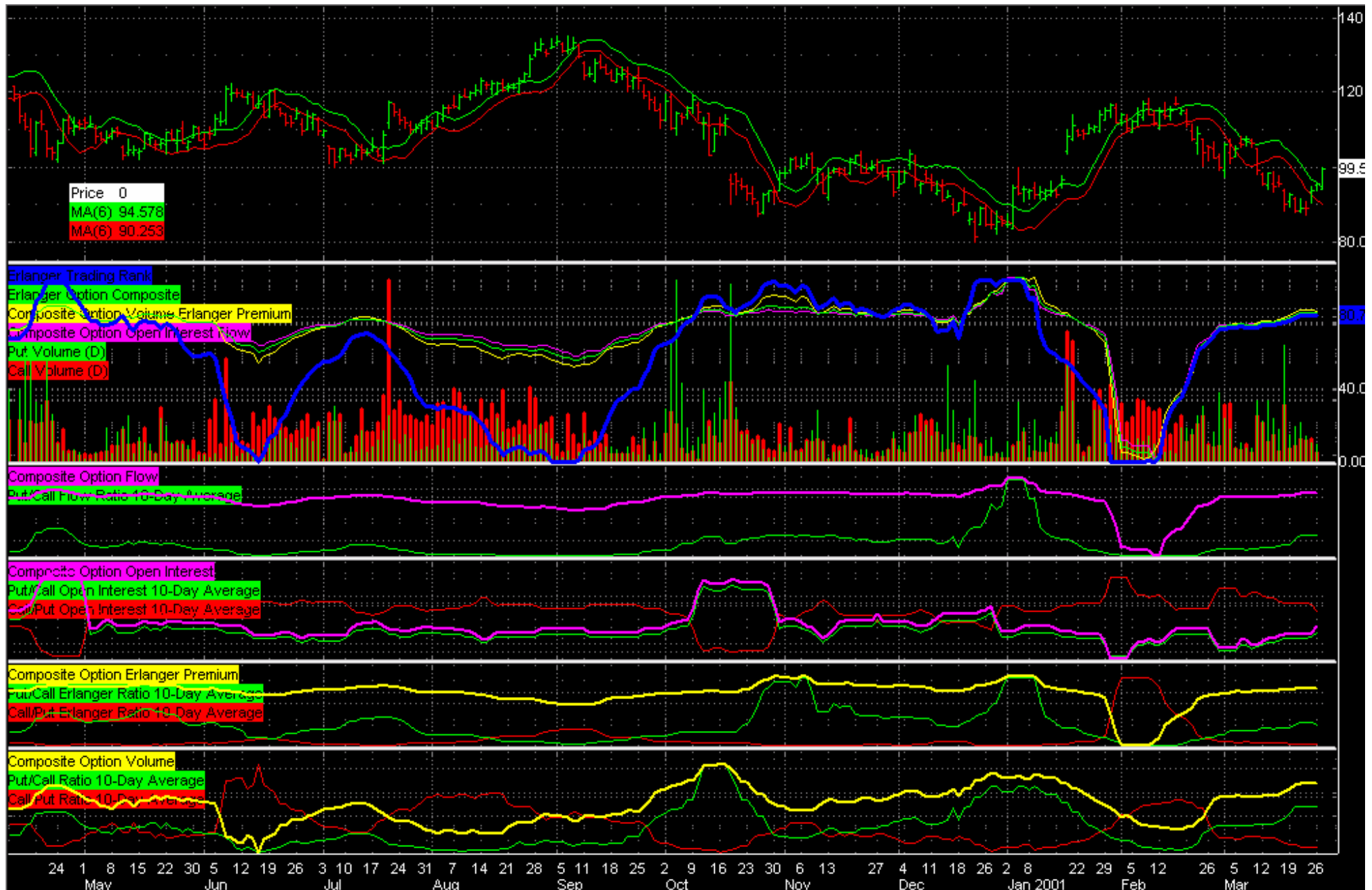
- 1) Volume of equity contracts traded.
- 2) Price and strike price of equity contracts traded.
- 3) Open interest of equity contracts outstanding.
- 4) Total money flow into equity contracts.

The Erlanger Options Rank:

- 1) Measures ratios - both put/call and call/put.
- 2) Ranges from 0 (unattractive) to 100 (attractive).



Erlanger Options Rank (Cont.):



Delivery of Data:

Erlanger Power Portfolio:

Erlanger Power Portfolio software enables the user to access data and generate reports designed to provide institutional investors and corporate officers with important technical information on over 6000 stocks, 139 industry groups and 18 sectors. There are two basic factors at the heart of this program - *short selling statistics* and modern models of stock price *relative performance*.

Erlanger 2000:

Erlanger 2000 puts advanced technical analysis and quantitative research on your desktop. Whether you want to find those stocks ranked as attractive from a technical or "sentiment" point of view, or to follow the markets using state-of-the-art methodologies, the tools are here. Erlanger 2000 uses state-of-the-art Internet data feeds from Quote.com and Erlanger servers - directly through the Internet. No more local data storage. All data is streamed through the Internet.

Quantitative (FTP):

Options Data from 1/15/98

Field1=Date
Field2=PutCallRatio 10DayAvg
Field3=CallPutRatio 10DayAvg
Field4=PutCallErlangerRatio 10DayAvg
Field5=CallPutErlangerRatio 10DayAvg
Field6=Erlanger Option Composite
Field7=Erlanger Options Rank

Issue Ranks from 1/3/94

Field1=Date
Field2=PowerRank
Field3=TechRank
Field4=ShortRank
Field5=Type
Field6=GroupRank
Field7=SectorRank

Group/Sector Indicators from 1/4/94

Field1=Date
Field2=IndexAvgPrice
Field3=IndexAvgPct
Field4=DailyADLine
Field5=DailyVolumeADLine
Field6=IssuesAbove50DayMovingAvg
Field7=1MonthHiLow
Field8=UpOf12

Group/Sector Ranks from 1/3/94

Field1=Date
Field2=Rank
Field3=AvgTechRank
Field4=AvgShortRank
Field5=AvgPowerRank
Field6=Type1Pct
Field7=Type2Pct
Field8=Type3Pct
Field9=Type4Pct