What _is_ a Trading System?
By Van K. Tharp, Ph.D.

We frequently get the question, from both beginning traders and investors to some seasoned investors, of: "What exactly is a system?" The purpose of this article will be to give you that information as clearly as possible. First, we'll go through some background information to help you understand what a system is outside of the context of trading. You'll learn how different people relate to systems according to how they relate to money. The second part of this article will focus on clearly defining what a trading system is. The third part of this article will focus on the broader picture of your system—your trading plan. Finally, we'll focus on some key elements in system development.

Business Systems

In Robert Kiyosaki's book, _Cash-Flow Quadrant_, he distinguishes two types of people who work for money and two types of people who have money working for them. In each case, one of the major distinguishing characteristics is how they deal with systems.

First, let's look at the idea of business systems. McDonald's, as a major franchise, is basically a large set of systems that one buys. In fact, a person who buys a McDonald's franchise must go to Hamburger University for about six months (I believe that's the length of it) to learn the systems for operating the franchise. There are systems for food delivery, preparing food, greeting customers, serving them within a minute, cleanup, etc. And all of these systems can easily be carried out by a manager who has a college degree and employees who might even be high school dropouts. In other words, a system is something that is repeatable, simple enough to be run by a 16 year old who might not be that bright, and works well enough to keep many people returning as customers.
Now, knowing that definition of a system, let's look at how people in the four cash flow quadrants relate to systems.

The Employee: Employees are basically motivated by security. They have a job and they do their work to get money. Employees basically run the systems. They don't necessarily know that they are running a system, but that is their function. For example, one employee at McDonald's will greet customers and take their order. This employee is basically running the "customer-greeting" system.

Most employees do not understand systems. Instead, they just know what their job is. And this is typical of employees who become traders or employees who work as traders. They typically ask questions such as "What stocks should I buy?" "What is the market going to do?" Or "How do I go about doing this?" We see it all the time in the questions we get. For example, a gentleman just called into CNBC, as I'm writing this, and asked the guest, "What direction do you think the market may go with respect to "the war" and how might one profit from it." These are typically employee questions. And they amount to saying, "I don't really understand anything, please tell me what to do!" And the financial media thrives by answering the questions of the employee investor/trader.

The Self-Employed Person: The self-employed person is basically motivated by control and doing it right. Notice that I have often talked about how these motivations constitute some of the biases that most traders have—the need to be right and the need to control the markets. The self-employed person is the entire system. They are basically running on a treadmill only they don't know it. And the more they work, the more tired they get.

Like the employee, the self-employed are working for money. However, they like it a little better, because they are in charge. They think working harder will make them more money—and to a certain extent it does. But mostly, working harder gets them tired. Nevertheless, they continue to plough forward thinking that they are the only ones who can do it right.

As I said earlier, the self-employed person basically is the system. And quite often they cannot see the system because they are so much a part of it. They are stuck in all the details. In addition, they have a strong tendency to want to "complexify" things. They are always looking for perfectionism and they believe that the perfect system must be complex. They are always asking, "What will make my system perfect?"

A lot of people come into trading from the self-employed mentality—doctors, dentists, and other professionals who had their own small business in which they were basically all of the systems in one. This is all they tend to know and they approach trading the same way. They keep adding complexity "until it works," even though this strategy seldom works. The self-employed person would be likely to have a discretionary system that is constantly being changed.

The Business Owner: A good business owner should be able to walk away from the business for a year and come back to find it running better than before. While this is an ideal type of statement, it has some theoretical truth to it. This should occur because the job of the business owner is to design a group of systems to run the business so well that his employees can do the job by themselves (or at least with a manager in place). In other words, the business owner is someone who designs systems and these are usually simple systems.

The business owner usually does very well in the trading arena if they approach the process the same way that they've run a business before. And, of course, the business owner would usually hire someone to run their trading system, at a much lower wage.

When Tom Basso,[1] who is interviewed in *The New Market Wizards*, did workshops with me, he always described himself as a businessman first and a trader second. Part of Tom's perspective was to look for repetitive tasks that a human being in his organization has to repeat over and over again. When he found such tasks, his job was to develop a program to take that task out of human hands. Routine computer programs are great examples of simple systems.

The Investor: The last person on the quadrant is the investor.   The investor is someone who invests in businesses and his/her most important criterion should be, "What is the

rate of return of the business?" In other words, this person is continuing to ask, "If I put money in this investment, what kind of return will I get on it?" High return investments (i.e., high returns on equity) are typically good businesses in which to put your money.

Robert Kiyosaki describes this as the quadrant in which money is converted to wealth. Rich people, according to Kiyosaki, derive 70% of their income from investments and 30% or less of their income from wages.

Most traders are probably not investors by this definition. They buy low or sell high, trading stocks. As a result, there is something they must do to generate their money. Investors, in contrast, are people who typically look for places where they can put their money that generate rates of returns of 25% or higher without them doing anything. If know how to get those types of returns, then you want to hold onto those investments as long as possible. Many high tech stocks were showing earnings growth rates of well over 25%, and when they did, the prices went up dramatically because this is what investors want. The problem with such investments, is they are not guaranteed to continue forever. Many of you have probably discovered that in the last 18 months.

What is a Trading System?

What most people think of as a trading system, I would call a trading strategy. This would consist of eight parts: 1) a market filter; 2) set up conditions; 3) an entry signal; 4) a worst case stop loss; 5) re-entry when it is appropriate; 6) profit-taking exits; 7) a position sizing algorithm; and 8) you might need multiple systems for different market conditions.

A **market filter** is a way of looking at the market to determine if the market is appropriate for your system. For example, we can have quiet trending markets, volatile trending markets, flat quiet markets, and flat volatile markets. And, of course, the trending markets can either be bullish or bearish. Your system might only work well in one of those market conditions. As a result, you need a filter to determine whether your system has a high probability of working. Should you trade your system or not?

The **set up conditions** amount to your screening criteria. For example, if you trade stocks, there are 7,000 plus stocks that you might decide to invest in at any time. As a result, most people employ a series of screening criteria to reduce that number down to 50 stocks or less. Examples of screens might include William O'Neil's CANSLIM criteria[2] or a value screen for stocks with good PERs or a good PEG ratio or a fundamental screen having to do with management and its return on assets. You might also have a technical set up, just prior to entry such as watching the stock to go down for seven straight days.

The **entry signal** would be a unique signal that you'd use on stocks that meet your initial screen to determine when you might enter a position—either long or short. There are all sorts of signals one might use for entry, but it typically involves some sort of move in your direction that occurs after a particular set-up occurs.

The next component of your trading system is your **protective stop**. This is the worst-case loss that you would want to experience and it defined 1-R (or your initial risk) for you. Your stop might be some value that will keep you in the stock for a long time (i.e., a 25% drop in the price of the stock) or something that will get you out quickly if the market turns against you (i.e., a 25 cent drop). Protective stops are absolutely essential. Markets don't go up forever and they don't go down forever. You need stops to protect yourself. As I said in *Trade Your Way To Financial Freedom*, entering the market without a protective stop is like driving through town ignoring red lights. You might get to your destination eventually, but your chances of doing so successfully and safely are very slim.

The fifth component of a trading system is your **re-entry strategy**. Quite often when you get stopped out of a position, the stock will turn around in the direction that favors your old position. When this happens, you might have a perfect chance for profits that is not covered by your original set-up and entry conditions. As a result, you also need to think about re-entry criteria. When might you want to get back into a closed out position? Under what conditions would this be feasible and what criteria would trigger your re-entry? These are what you need to address in thinking about re-entry.

The sixth component of a trading system is your **exit strategy**. The exit strategy could be very simple. For example, it might simply be a 25% trailing stop where you adjust the stop to 75% of the closing price whenever a stock makes a new high. The stop is always adjusted up, never down.

However, you may have many possible exits in addition to a trailing stop. For example, a large volatility move (i.e., 1.5 times the average daily volatility) against you in a single day is a good exit. Crossing a significant moving average (i.e., the 50 day) might be a great exit. Technical signals are good exits (i.e., breaking a significant trend line.) Exits are one of the more critical parts of your system. It is one factor in your trading of which you have total control. And it is your exits that control whether or not you make money in the market or have small losses. You should spend a great deal of time and thought on your exit strategies.

The seventh component of your system is your **position sizing algorithm**. Position sizing is that part of your system that controls how much you trade. It determines how many shares of stock should you buy. A general recommendation would be to continually risk 1% of your portfolio. Thus, if you have a $25,000 portfolio, you wouldn't want to risk more than $250.

Let's say you wanted to buy a stock at $10. You decided to keep a 25% trailing stop, meaning if the stock dropped 25% to $7.50 you would exit your position. Since your stop is your risk per share, you would divide that $2.50 risk into $250 to determine the number of shares to purchase. Since $2.50 goes into $250 100 times, you would purchase 100 shares of stock. Notice that you would be buying $1,000 worth of stock (100 shares @ $10.00 each) or four times your risk of $250. This makes sense since your

stop is 25% of the purchase price. Thus, your risk would be 25% of your total investment.   If you want to know more about position sizing, I'd suggest that you read and review *Trade Your Way to Financial Freedom*, my *Money Management Report*, or my *Position Sizing DVDs.*.

Finally, depending upon how robust your trading system is, you might need **multiple trading systems** for each type of market. At minimum, you might need one system for trending markets and another system for flat markets.

The Entire Trading System: Your Business Plan for Trading[3]

Remember that I said that what most people consider a trading system, is simply a trading strategy that should be part of an overall business plan. Without the overall business plan, many people would still lose money. As a result, let's look at the overall context in which a trading strategy should be made—your business plan. Nevertheless, here is a summary of what we consider to be essential for a good trading plan.

 I have written extensively on this subject, therefore for the purposes of this article, the following is just a brief overview:

1) *The Executive Summary*.   This is usually the last section written. It reviews all of the material of the plan and presents it in summary form. It should describe in detail the objective of the plan and then briefly describe, without a lot of detail, how the objectives will be achieved.

2) *A Business Description*.   The business description should include the mission of the business, an overview of the business and its history, the products and services you provide (which is growth of capital and risk control as a trader), your operations, operational considerations such as equipment needed and site location, and your organization and management of employees (if any). All of these topics are fairly self-explanatory, but you should take the time to write them out as part of your plan.

3) *An Industry Overview and Competition*.   In the industry overview you need to look at the factors influencing the market. For example, Ed Yardeni in his web site lists ten major factors influencing the market. These include a globally competitive economy, a revolution in innovation, wireless access to the Internet, low tech companies having access to high tech tools and changing their businesses as a result, the need to outsource to increase productivity, and many other themes. See www.yardeni.com for more information. In addition, you also need to know who/what your competition is. Who are you trading against? What are their beliefs? What advantages do they have that you don't? What advantages do you have that they don't?

4) *Self-Knowledge Section*: You need to know your strengths and your weaknesses and list them in this section. You need to know how to capitalize on your strengths and avoid (or overcome) your weaknesses.

5) *Your Trading Plan Itself*. The tactical trading plan should be a part of your trading plan, but it should also include (a) your trading beliefs that form the basis of your plan, (b) any strategic alliances you may have, and (c) what you plan to do in terms of education and coaching.

6) *Your Trading Edges*: I believe your trading plan should also include a listing of all of the trading edges that you have in the market. When you list your edges, you can review them often and be sure that you capitalize upon them. For example, your edges might include a) the fact that you don't have to trade; b) your understanding of R-multiples and position sizing (which give people a huge edge over those who have no idea about these concepts); c) your ability to read a level II screen to get excellent stock trades; d) your sources of information; e) your ability to plan well in advance so that you have a game plan each day; f) your skill in following the ten tasks of trading; g) your knowledge of yourself and your strengths and weaknesses. This is just a sample of the possible edges that you might have over the average trader/investor.

7) *Financial Information*. This section should include three parts. The first part is your budget. How much money do you have? What will the trading process cost you? The second part will be your cash flow statement. Does your plan make sense in terms of cash flow? And finally, the third part will include profit and loss statements. If you have no trading record, you need to make estimates based on historical testing and based on paper trading.

8) *Worst Case Contingency Planning*. Things always happen that you have not accounted for or planned for in your trading plan. How will you deal with these elements? What will you do if any of these things come up? How will you make decisions when these elements come up?

If you want more information, I have *Market Mastery* newsletters that were devoted to business planning.

Developing a System
I am revisiting an interview I did with LTC Ken Long, a systems expert with the U.S. Army. Here's what Ken said about developing a system:

Define Who You Are: "Before you conduct any planning or system design, you must have a thorough understanding of who you are and what your objectives are. Individual investors, private hedge fund managers, public mutual fund managers, and trust managers—these groups will have different dynamics, time frames, and risk profiles.

This relates to system design in that the final product must fit the circumstances and dynamics of the group or individual. If you jump into system design without considering these basics, you will sow the seeds of future problems."

Objectives: "In trading system design, the problem is to define what you want the system to accomplish. With as many ideas, events, circumstances and adjustments that occur in system development, you have to have your objectives crystal clear in your mind. If you don't know where you are going, then any old road will do."

"Objectives give you the basis for making choices and prioritizing actions. This is not to say that objectives are static. In fact, they can change as you discover either unexpected limitations or advantages in your system as it matures. But before you start you must have an initial set of goals and objectives to guide you."

Calibration: "After the system is deployed and operational, part of the process of calibrating the system is checking to see if the objectives still fit the person or organization that you have become. That's a very exciting part of system design. I can't tell you how often I've been part of a design team that started with a limited set of objectives and discovered in the "imagineering" phase that by adjusting our sights we were able to accomplish far more for much less. But, you have to start somewhere. If you don't start with objectives, you are spinning your wheels."

I posed this question to Ken: "This section is critical. How will you know if your system is working or not? What are your performance benchmarks? What are your criteria for knowing that your system is not working? How will you make decisions when these criteria are met? Will you scrap everything or just make position sizing adjustments? All of these questions are critical to developing and operating a good trading system."

How to Make Decisions Within the System: Here's what Ken said about this critical topic:

> "If you don't work out how you will make decisions ahead of time, then you will certainly have to sort it out at the time of the first difficult decision. If you make decisions on the spot, with no guidelines, you have two problems: 1) figuring out what to do and 2) how to do it. And these problems must be faced under great stress and limited time. It's better to calmly sort out the decision making process ahead of time so that the decision mechanism is agreed to before hand."

> "In the Army, no plan usually survives the first contact with the enemy, and so our goal in planning is to develop a range of alternatives that can apply to a number of scenarios. Through rehearsal and analysis, we know which strategy works best for a given set of conditions. The goal of strategy development is to provide the decision maker with a menu of choices which are robust enough to cover a wide range of contingencies."

"In general system development then, we look for robust, simple plans that can cover a wide range of conditions. When you preplan like this, you don't try to force the world to adapt to your plan. If you fall in love with a strategy and become emotionally invested in making it work no matter what the market or the world says, you lose the ability to adapt and learn."

"A real world example for a trading system might be a trader who decides to check his actual trading performance every month against the calculated system expectancy, and determine the statistical significance of the variation. He might decide that any result greater than one or two standard deviations is a signal to stop trading and recalibrate the system or reconfirm the validity of the trading model and its underlying assumptions. If the actual expectancy is close to the predicted expectancy, then the trader knows he's on target. In modern manufacturing systems this concept is called "Statistical Process Control.""

"It lets the system controller know when the production machines are drifting out of tolerance and degrading the quality of the output to the point where the line is stopped and the machines are retooled."

I asked Ken about how his advice applies in view of the fact that many trading systems are automated. Here's how he responded:

"It's a general problem of the information age which provides us with a wide range of automated decision support systems that can compile massive amounts of data, analyze and process it, and present us with decision packages for action based on criteria that we can specify. I use a lot of these. However, the key to making them work is to make sure that you understand the underlying business model and system logic. When you do things automatically by computer, you need to understand what the computer is calculating and filtering. I won't use power tools until I know how they work and I have mastered their use in simulations."

"If you have done all the preparation work that you outlined in your system design workshop,[4] and you have chosen indicators that provide you the right signals for making your trading decisions, then the right thing to do is to rely on the signals to make your decisions. Periodic calibration of the system, however, is still necessary to confirm that you have chosen the correct signals and that your actions are correct. If you have not done that work though, it may be the case that you simply picked up the latest hot indicator and are using it regardless of how appropriate it may be for your trading system. If it fails to work as advertised, you are likely to dump it for the next hot idea that comes along. Then you're not a system's trader, you are only reacting to advertising."

Notes

1. We have two newsletter back issues in which we interviewed Tom Basso for those of you who would like to know more. Call 919-466-0043 for more information.
2. William O'Neil, *How to Make Money In Stocks*. New York: McGraw-Hill, 1987.
3. We have an audio program on business planning for traders where we take you through the development of a business plan.
4. The workshop Ken is referring to is the, "*How to Develop a Winning Trading System That Fits You*" workshop, which we offer once or twice each year.