# Designing a Mechanical Trading System: Part I

***Editor's Note:*** *Nathan O. is at it again…*

*After preparing a special report on how to supercharge a trend following system, we received a few emails asking for more details on Nathan's mechanical trading system.*

*Ever the gentleman, Nathan agreed to put together a multi-part series outlining his discoveries and insights gained from developing his own mechanical trading series.  We think the series will offer tremendous value for both mechanical AND discretionary traders.*

*This series is  part of the* ***Mercenary Vault****, an archive of high quality materials available to Mercenary Dispatch subscribers.  The Dispatch is our means of direct communication (via email) with Mercenary community members – and it's free! Sign up here – and don't miss out on future exclusives.*

## <u>Part I: Why design a mechanical trading system & First Steps</u>

So you have decided you want to trade a mechanical trading system, but you are not sure how to go about creating one. Although there are plenty of systems to purchase, you have made the wise choice to create your own from scratch or from some basic trading concepts you have developed…

This may come across strange that a person who has developed systems and sells them would encourage you to venture out on your own. I am recommending you do exactly that for the following reasons:

- **Even if you only develop 1 or 2 crude trading systems the learning experience will provide amazing benefits to your trading progress (I can almost guarantee it)**

Let's face it, reading books and education are important but you don't learn to fly a plane through illustrations/reading alone. Eventually you must get behind the yoke, putting theory into practice.

I know of no better way to improve as a trader than real world trading experience. I also strongly believe spending some time in the "think tank" provides tangible and intangible rewards. Whether it is simply disproving a concept you have clung on to for many years or a repeating pattern jumping off the screen at you, the design of a trading system can start to point you in the right direction.

If you have been consistently losing money or you have just reached the break-even results level (which is a key progression), one or two changes (refinements) could be all that is holding you back from turning the corner to profitable trading.

- **If you decide to purchase a system, you will gain valuable insight in determining quickly whether the system has merit or glaring, gaping holes in it**

I can give you two examples of what I am talking about here:

I had designed a day trading system many years ago and asked a fellow trader to look at it. This trader had designed many systems before finally arriving at his finished product. As far as I know, to this day he is still trading his same system profitably. It took him only 15 – 20 minutes to point out a few obvious flaws with my system that probably saved me thousands of dollars.

Because he had been through the process himself from scratch, he had experience and knowledge that reared its "ugly" head with great impact.

I learned a lot from him through that experience. It wasn't being told about the specific flaws that made it a learning experience; it was the REASONS why they were flaws within my system. He would not have been able to provide such valuable insight without having gone through it himself.

Second, I had purchased a few canned systems over the years before I set out on my quest that led me to trend following. During that time I was still developing systems on my own and that experience was invaluable.

One system I purchased had a 90-day money back guarantee (luckily). Within 2-3 days I quickly found some serious flaws and knew quickly it would not make money in the long run. I thought about sending a detailed explanation to the vendor to justify why the system wouldn't work, but I thought better of it and just demanded a refund.

Unfortunately there are many system sellers that either (A) know their product is not profitable, or worse (B) don't even realize their system isn't profitable. By going through the process of designing a system you can evaluate existing systems and break them down quickly to determine if they have merit.

I do want to point out that there is a big difference in a system not working or being profitable and the trader not following the rules of the system and then losing money.

To use a very simple examples, if a trading system has a winning percentage of 30% (averages 3 winning trades out of 10) you can't take the first two signals and because they are losses deem the system "worthless." Additionally, you can't risk 8% on single trades when the system calls for 1% and then cry about being down 16% after only two trades.

Lack of trading discipline is not the fault of the system, but the trader.

## First Steps

The first step in designing any system is to know the style of trading. Is it trend following, swing trading, option income, day trading or a combination of any of the above.

For our purposes let's assume we are going to design a swing trading system. Despite the fact that I am a trend trader (with a few twists), I have traded swing trading profitably. My heart and soul are just in the big moves, which is why I came back to and still trade my own funds in this manner.

The type of system is less important than the actual thought process anyway. Day trading and swing trading concepts still played an important role in designing my own trend following system.

So now that we have agreed we will build/design a swing trading system, let's lay out the order of the trade. By order of the trade, I mean what conditions tell us to ready our weapon and take the safety off, what conditions tell us to pull the trigger and what conditions tell us when the hunt is over.

Because it is going to be a mechanical system, we simply accept that the charts determine everything. We don't take trades for any other reason that our conditions being met. Fundamental analysis will not play a role.

**Ready our Weapon**

Going back to the "ready our weapon" stage, since we are a swing trader we need to determine the conditions that tell us a trade "may" take place.

Although there are countless methods to try, for the sake of our system let's design it around simple support and resistance. Even though this is a simple concept, you may be surprised to find out that there are a legion of profitable traders that only trade support and resistance. This is their bread & butter, and you might be even more surprised at how few indicators are displayed on their charts (as in zero to 1).

Since we are designing a system around support and resistance, we need to come up with a mechanical way to measure support and resistance.

Obviously most traders can eyeball support and resistance (and I am not saying you can't use these visual areas), but let's say we are brand new to trading and want help finding it.

A very simple, yet effective way is to use price channels (using the close vs. the high or low). Using a 25-day price channel based on closing prices will give you a good idea of support and resistance levels. If price touches these areas twice (forming a straight line), we have a support or resistance area.

For now I am going to avoid adding filters for entries or anything more advanced. Those features are more for "fine tuning" something that already works. If a filter makes a system profitable from being not profitable without it, I would argue you don't have a very good system from the start. As well, we are not going to delve into portfolio allocation either at this point. We are going to focus on the core system and the process.

Below is an example of a support and resistance area on AAPL:


We can see the $350 – $353 area is currently a support area. The fact that the same area had previously been resistance (April/June of 2011) lends further credence to it being a daily support level. The experience trader can quickly pick this area out visually, but the price channels help bring the novice to the right area of focus.

Now that we have our support area, if AAPL approaches the $350 – $353 range we "ready our weapon" for a possible trade (long in this case).

As basic and simple as this process is, I can tell you many investors and traders don't even have the patience to ready their weapons. This teaches discipline, patience and stresses the "sniper" mentality vs. jumping out of the bushes with guns blazing at the first hint of a trade.

For swing trading (or any style trading for that matter), there should always be a condition that puts you on guard or generates your interest. Let the market come to you, don't chase the market or hyperventilate trying to find a trade, ANY TRADE, as soon as possible. If AAPL goes to our support area, we don't automatically take a trade. We simple prepare for a reversal.

**<u>Fire Our Weapon</u>**

So our prey has entered our support area and our safety is now off. The difference between a novice trader and seasoned professional becomes evident quickly here.

The novice trader may simply enter a market order (despite not meeting a requirement to actually enter a position) with excitement.

"*It is at support, it previously had been resistance so what can go wrong?*"

But the seasoned trader reacts to what actually happens vs. what could or may happen.

For most swing trading systems trading support/resistance, some type of reversal or price action is required to enter an order. I am going to give you two reversal patterns that are highly effective (not 100%, as nothing is in trading). They are the pin bar (short for pinnochio) and an outside reversal bar.

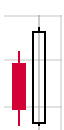
A pin bar is lying, telling you price is going in one direction when it is actually more likely going in the opposite direction. If you use candles on your charts it goes by many other names, but the name of it is irrelevant. These reversals flat out work enough of the time to make them valuable.

An outside bar completely engulfs the preceding bar and closes below that same bar (if a reversal bar at resistance) or above that same bar if a reversal at support. Examples of both are included below:

**PIN BAR** – Open and close are at top of bar range, and the low is well below the low of the previous day.

Although sellers pushed prices down, buyers brought price back up to near the high by the end of the day. These have extreme significance at support and resistance levels.

When you see one of these, it typically tells you the break-out below support (in this case) was a false break-out. If price breaks above the high of the bar the next day you have a high-probability long trade that is going to bounce away from support.



**BULLISH OUTSIDE REVERSAL BAR** – Reversal bar engulfs the prior bar, opens low and closes above entire range of same prior bar.

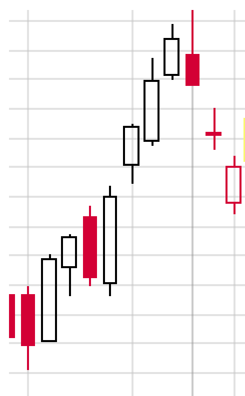
If this happens at a key support level, it typically tells you price will bounce back towards resistance and away from the support level. Although it opened lower, it is telling you the sellers had no conviction and the buyers lined up to take price back away from the support area.

It is important that you understand these reversal patterns by themselves mean very little. It is WHERE they occur that provides an edge. In consolidation or in the middle of a range they offer little value, but near swing highs, swing lows and support/resistance areas they can be deadly.

Below is a recent example on SIRI where we get a pin bar at a previous support level:

You will notice that we break below the previous support area, but then close near the high by the end of the day. At this point we enter an order to buy above the PIN BAR's high, which triggers the next day. We put our stop below the low of the PIN BAR.

Below is an example of an outside bearish reversal bar on MSFT at a swing high:



Upon the break of the reversal bar's low (which in this case was a gap opening lower), we would enter an order to go short. Our stop would be above the high of the reversal bar.

At this point we have the conditions that put a trade in our sights, (price hitting support/resistance areas) our trigger (reversal bar) and our initial stop loss placement. I hope it is painfully obvious that we are still missing some key ingredients at this point…… position sizing, exit strategy(ies), portfolio allocation, etc….

Despite this very basic and simple start to a mechanical swing trading system, there is enough information here to start you down the road to being dangerous. Even though I will cover exit strategies and other concepts in additional installments to come, there is enough here already to turn this into a profitable (positive expectation) system.

I think in many cases traders shy away from simple trading methods like support/resistance or buying retracements in trends for no good reason. They search for more exotic methods, more exotic indicators or more impressive ways to make money trading.

While I made improvements to standard trend following, standard trend following still works and I incorporated 70 – 80% of that basic method into my own system. Don't reinvent the wheel just to reinvent the wheel, take the wheel and refine/mold it with enhancements through experimentation. Further match the trading style to your trading psychology and you are well on your way to profitable trading.

Many of these same thought processes can be applied to swing trading by buying retracements (the options are limitless) in established trends. Find a breakout or trending market, look for a reversal bar at a swing low (in an established uptrend) for the trigger. Start with a basic model/concept (or borrow one), and walk through the steps of determining what makes you ready your weapon and pull the trigger on trades. I will give you some exit strategies in the next installment.

*"It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all, try something."* ~Franklin Roosevelt



**p.s.** ***PS. Follow us on Stocktwits and Twitter! @MercenaryJack* & *@MercenaryMike***