

# Turtle trading rules

## bonus chapter

# ORIGINAL TURTLE TRADING RULES

*I always say that you could publish my trading rules in the newspaper and no one would follow them. The key is consistency and discipline. Almost anybody can make up a list of rules that are 80% as good as what we taught our people. What they couldn't do is give them the confidence to stick to those rules even when things are going bad.*

—Richard Dennis, quoted in *Market Wizards* by Jack D. Schwager

### A Complete Trading System

**M**ost successful traders use a mechanical trading system. This is not a coincidence. A good mechanical trading system automates the entire process of trading. The system provides answers for each of the decisions a trader must make while trading. It makes it easier for a trader to trade consistently because there is a set of rules that specifically define exactly what should be done. The mechanics of trading are not left up to the judgment of the trader.

If you know that your system makes money over the long run, it is easier to take the signals and trade according to the system dur-

ing periods of losses. If you are relying on your own judgment when you are trading, you may find that you are fearful when you should be bold and courageous when you should be cautious.

If you have a mechanical trading system that works and follow it consistently, your trading will be consistent despite the inner emotional struggles that may result from a long series of losses or a large profit. The confidence, consistency, and discipline afforded by a thoroughly tested mechanical system are the key to many of the most profitable traders' success.

The Turtle Trading System was a *complete* trading system. Its rules covered every aspect of trading and left no decisions to the subjective whims of the trader. It had every component of a complete trading system that covers each of the decisions required for successful trading:

- **Markets:** What to buy or sell
- **Position Sizing:** How much to buy or sell
- **Entries:** When to buy or sell
- **Stops:** When to get out of a losing position
- **Exits:** When to get out of a winning position
- **Tactics:** How to buy or sell

## Markets: What to Buy or Sell

The first decision is what to buy and sell or, essentially, what markets to trade. If you trade too few markets, you greatly reduce your chances of getting aboard a trend. At the same time, you do not want to trade markets that have too low a trading volume or that do not trend well.

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## Position Sizing: How Much to Buy or Sell

The decision about how much to buy or sell is fundamental, yet it often is glossed over or handled improperly by most traders.

How much to buy or sell affects both diversification and money management. Diversification is an attempt to spread risk across many instruments and increase the opportunity for profit by increasing the opportunities for catching successful trades. Proper diversification requires making similar, if not identical, bets on many different instruments. Money management is really about controlling risk by not betting so much that you run out of money before the good trends come.

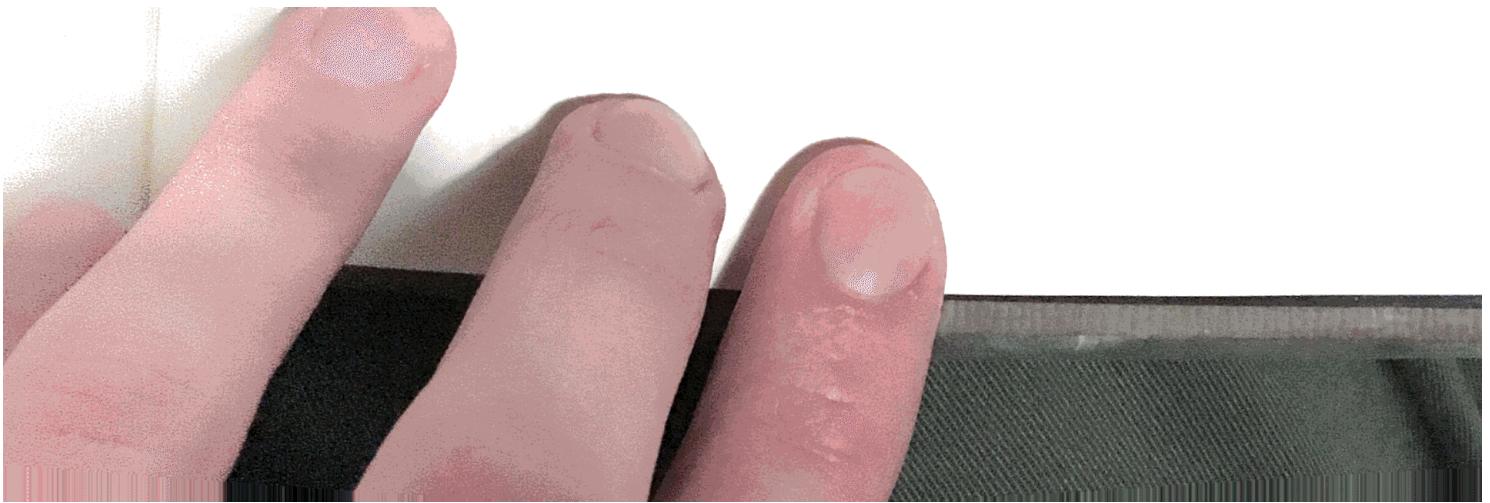
How much to buy or sell is the single most important aspect of trading. Most beginning traders risk far too much on each trade and greatly increase their chances of going bust even if they have an otherwise valid trading style.

## Entries: When to Buy or Sell

The decision about when to buy or sell often is called the entry decision. Automated systems generate entry signals that define the exact price and market conditions that tell you when to enter the market whether by buying or by selling.

## Stops: When to Get Out of a Losing Position

Traders who do not cut their losses will not be successful in the long term. The most important thing about cutting your losses is to predefine the point at which you will get out before you enter a position.



## Exits: When to Get Out of a Winning Position

Many “trading systems” that are sold as complete systems do not specifically address the exit of winning positions. However, the question of when to get out of a winning position is crucial to the profitability of the system. Any trading system that does not address the exit of winning positions is not a complete system.

## Tactics: How to Buy or Sell

Once a signal has been generated, tactical considerations regarding the mechanics of execution become important. This is especially true for larger accounts, where the entry into and exit of positions can result in significant adverse price movement, or market impact.

Using a mechanical system is the best way to make money consistently in trading. If you know that your system makes money over the long run, it is easier to take the signals and follow the system during periods of losses. It is worth repeating that if you rely on your own judgment, during trading you may find that you are fearful when you should be courageous or courageous when you should be fearful.

If you have a profitable mechanical trading system and follow it religiously, your trading will be profitable and the system will help you survive the emotional struggles that inevitably result from a long series of losses or large profits.

The trading system that was used by the Turtles was a complete trading system, and that was a major factor in our success. Our system made it easier to trade consistently and successfully because it did not leave important decisions to the discretion of the trader.

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### Markets: What the Turtles Traded

The Turtles were futures traders, at the time more popularly called *commodities traders*. We traded futures contracts on the most popular U.S. commodities exchanges. Since we were trading millions of dollars, we could not trade markets that had only a few hundred contracts per day because that would mean that the orders we generated would move the market so much that it would be too difficult to enter and exit positions without taking large losses. The Turtles traded only the most liquid markets. In fact, market liquidity was the primary criterion Richard Dennis used when determining which markets we were to trade.

In general, the Turtles traded all liquid U.S. markets except the grains and the meats. Since Richard Dennis already was trading the full legal position limits for his own account, he could not per-

mit us to trade grains for him without exceeding the exchange's position limits. We did not trade the meats because of a corruption problem with the floor traders in the meat pits. Some years after the Turtles disbanded, the FBI conducted a major sting operation in the Chicago meat pits and indicted many traders for price manipulation and other forms of corruption.

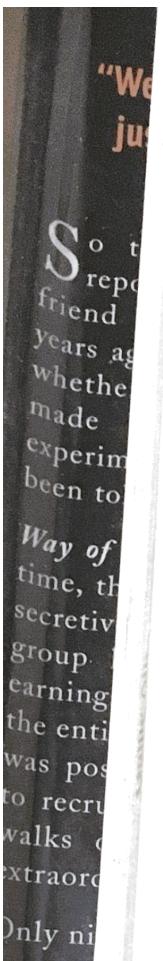
The following is a list of the futures markets traded by the Turtles:

## Chicago Board of Trade

- 30-year U.S. Treasury bond
- 10-year U.S. Treasury note

## New York Coffee Cocoa and Sugar Exchange

- Coffee

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- Cocoa
- Sugar
- Cotton

**Chicago Mercantile Exchange**

- Swiss franc
- Deutschmark
- British pound
- French franc
- Japanese yen
- Canadian dollar
- S&P 500 stock index
- Eurodollar
- 90-day U.S. Treasury bill

**Comex**

- Gold
- Silver
- Copper

**New York Mercantile Exchange**

- Crude oil
- Heating oil
- Unleaded gas

The Turtles were given the discretion of not trading any of the commodities on the list. However, if a trader chose not to trade a

particular market, he was not to trade that market at all. We were not supposed to trade markets inconsistently.

**Position Size**

The Turtles used for its day by adjusting the market. That up or down on terms (compare underlying vola

This was done a large amount of contracts than

This volatility that different chance for a price increased the efficiency of markets.

Even if the market can't trend we have held more

**Volatility:**

The Turtles called N to market. N is simply

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particular market, he was not to trade that market at all. We were not supposed to trade markets inconsistently.

## Position Sizing

The Turtles used a position sizing algorithm that was very advanced for its day because it normalized the dollar volatility of a position by adjusting the position size on the basis of the dollar volatility of the market. That meant that a specific position would tend to move up or down on a specific day about the same amount in dollar terms (compared with positions in other markets) regardless of the underlying volatility of that particular market.

This was done because positions in markets that moved up and down a large amount per contract would have an offsetting smaller number of contracts than would positions in markets that had lower volatility.

This volatility normalization was very important because it meant that different trades in different markets tended to have the same chance for a particular dollar loss or a particular dollar gain. This increased the effectiveness of the diversification of trading across many markets.

Even if the volatility of a specific market was lower, any significant trend would result in a sizable win because the Turtles would have held more contracts of that lower volatility commodity.

## Volatility: The Meaning of *N*

The Turtles used a concept that Richard Dennis and Bill Eckhardt called *N* to represent the underlying volatility of a particular mar-

ket.  $N$  is simply the 20-day exponential moving average of the true range, which is now more commonly known as the Average True

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Range (or ATR). Conceptually,  $N$  represents the average range in price movement that a particular market experiences in a single day, accounting for opening gaps.  $N$  was measured in the same points as the underlying contract.

To compute the daily true range, one uses the following relationship:

$$\text{True range} = \max(H - L, H - PDC, PDC - L)$$

where

$H$  = current high

$L$  = current low

$PDC$  = previous day's close

To compute  $N$ , one can use the following formula:

$$N = \frac{(19 \times PDN + TR)}{20}$$

where

$PDN$  = previous day's  $N$

$TR$  = current day's true range

Since this formula requires a previous day's  $N$  value, you must start with a 20-day simple average of the true range for the initial calculation.

### Dollar Volatility Adjustment

The first step in determining the position size was to determine the dollar volatility represented by the underlying market's price volatility (defined by its  $N$ ).

This sounds more complicated than it is. It is determined by using the following simple formula:



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$$\text{Dollar volatility} = N \times \text{dollars per point}$$

## Volatility-Adjusted Position Units

The Turtles built positions in pieces that we called units. Units were sized so that  $1N$  represented 1 percent of the account equity.

Thus, the unit size for a specific market or commodity can be calculated by using the following formula:

$$\text{Unit size} = \frac{1\% \text{ of account}}{\text{market dollar volatility}}$$

or

$$\text{Unit size} = \frac{1\% \text{ of account}}{N \times \text{dollars per point}}$$

Following are some examples.

### Heating Oil HO03H

Consider the following prices, true range, and  $N$  values for March 2003 heating oil:

Date	High	Low	Close	True Range	N
11/1/2002	0.7220	0.7124	0.7124	0.0096	0.0134
11/4/2002	0.7170	0.7073	0.7073	0.0097	0.0132
11/5/2002	0.7099	0.6923	0.6923	0.0176	0.0134
11/6/2002	0.6930	0.6800	0.6838	0.0130	0.0134
11/7/2002	0.6960	0.6736	0.6736	0.0224	0.0139
11/8/2002	0.6820	0.6706	0.6706	0.0114	0.0137
11/11/2002	0.6820	0.6710	0.6710	0.0114	0.0136

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Date	High	Low	Close	True Range	N
11/12/2002	0.6795	0.6720	0.6744	0.0085	0.0134
11/13/2002	0.6760	0.6550	0.6616	0.0210	0.0138
11/14/2002	0.6650	0.6585	0.6627	0.0065	0.0134
11/15/2002	0.6701	0.6620	0.6701	0.0081	0.0131
11/18/2002	0.6965	0.6750	0.6965	0.0264	0.0138
11/19/2002	0.7065	0.6944	0.6944	0.0121	0.0137
11/20/2002	0.7115	0.6944	0.7087	0.0171	0.0139
11/21/2002	0.7168	0.7100	0.7124	0.0081	0.0136
11/22/2002	0.7265	0.7120	0.7265	0.0145	0.0136

11/25/2002	0.7265	0.7098	0.7098	0.0167	0.0138
11/26/2002	0.7184	0.7110	0.7184	0.0086	0.0135
11/27/2002	0.7280	0.7200	0.7228	0.0096	0.0133
12/2/2002	0.7375	0.7227	0.7359	0.0148	0.0134
12/3/2002	0.7447	0.7310	0.7389	0.0137	0.0134
12/4/2002	0.7420	0.7140	0.7162	0.0280	0.0141

The unit size for December 6, 2002, using the N value of 0.0141 from December 4, is as follows:

*Heating oil:*

$$N = 0.0141$$

Account size = \$1,000,000

Dollars per point = 42,000 (42,000-gallon contracts with price quoted in dollars)

$$\text{Unit size} = \frac{0.01 \times \$1,000,000}{0.0141 \times 42,000} = 16.88$$

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Since it is not possible to trade partial contracts, this would be truncated to an even 16 contracts.

You might ask: "How often is it necessary to compute the values for N and the unit size?" The Turtles were provided with a unit size sheet on Monday of each week that listed N and the unit size in contracts for each of the futures that we traded.

## The Importance of Position Sizing

Diversification is an attempt to spread risk across many instruments and increase the opportunity for profit by increasing the opportunities to catch successful trades. To diversify properly requires making similar if not identical bets on many different instruments.

The Turtle System used market volatility to measure the risk involved in each market. We then used that risk measurement to build positions in increments that represented a constant amount of risk (or volatility). That enhanced the benefits of diversification and increased the likelihood that winning trades would offset losing trades.

Note that this diversification is much harder to achieve when one is using insufficient trading capital. Consider the above example if a \$100,000 account had been used. The unit size would have been a single contract, since 1.688 truncates to 1. For smaller accounts, the granularity of the adjustment is too large, and this greatly reduces the effectiveness of diversification.

## Units as a Measure of Risk

Since the Turtles used the unit as the base measure for position size and since those units were adjusted for volatility risk, the unit was

~~a measure of the risk both of a position and of the entire portfolio~~

a measure of the risk due to a position and of the entire portfolio  
of positions.

The **Turtles** were given risk management rules that limited the number of units that we could maintain at any specific time on four different levels. In essence, those rules controlled the total risk that a trader could carry, and those limits minimized losses during prolonged losing periods as well as during extraordinary price movements.

An example of an extraordinary price movement was the day after the October 1987 stock market crash. The U.S. Federal Reserve lowered interest rates by several percentage points overnight to boost the confidence of the stock market and the country. The **Turtles** were loaded short in interest-rate futures: eurodollars, T-bills, and bonds. The losses the next day were enormous. In most cases, 40 to 60 percent of account equity was lost in a single day. However, those losses would have been correspondingly higher without the maximum position limits.

The limits were as follows:

<b>Level</b>	<b>Type</b>	<b>Maximum Units</b>
1	Single market	4
2	Closely correlated markets	6
3	Loosely correlated markets	10
4	Single direction, long or short	12

**Single markets:** A maximum of 4 units per market.

**Closely correlated markets:** For markets that were closely correlated, there could be a maximum of 6 units in one particular direction (i.e., 6 long units or 6 short units). Closely correlated market groups include heating oil and crude oil; gold and silver; the currencies as a group; interest rate futures such as T-bills and eurodollars; and so on.

**Loosely correlated markets:** For loosely correlated markets, there could be a maximum of 10 units in one particular direction. Loosely correlated markets included gold and copper; silver and copper; and many grain combinations that the Turtles did not trade because of position limits.

**Single direction:** The maximum number of total units in one direction long or short was 12 units. Thus, one theoretically could have had 12 units long and 12 units short at the same time.

The Turtles used the term *loaded* to represent having the maximum permitted number of units for a particular risk level. Thus, loaded in yen meant having the maximum 4 units of Japanese yen contracts, completely loaded meant having 12 units, and so forth.

## Adjusting Trading Size

There are times when the market does not trend for many months. During those times, it is possible to lose a significant percentage of the equity of the account.

After large winning trades close out, one may want to increase the size of the equity used to compute position size.

The Turtles did not trade normal accounts with a running balance based on the initial equity. We were given notional accounts with a starting equity of zero and a specific account size. For example, many Turtles received a notional account size of \$1 million when we started trading in February 1983. That account size was adjusted each year at the beginning of the year. It was adjusted up or down depending on the success of the trader as measured subjectively by Rich. The increase or decrease typically represented



something close to the addition of the gains or losses that were made in the account during the preceding year.

The Turtles were instructed to decrease the size of the notional account by 20 percent each time we went down 10 percent of the original account. Thus, if a Turtle trading a \$1,000,000 account ever was down 10 percent, or \$100,000, we would begin trading as if we had an \$800,000 account until we reached the yearly starting equity. If we lost another 10 percent (10 percent of \$800,000 or \$80,000, for a total loss of \$180,000), we would reduce the account size by another 20 percent for a notional account size of \$640,000.

There are other, perhaps better strategies for reducing or increasing equity as the account goes up or down. These are the rules that the Turtles used.

## Entries

The typical trader thinks mostly in terms of the entry signals when she is thinking about a particular trading system. Traders believe that the entry is the most important aspect of any trading system.

They might be surprised to find that the Turtles used a very simple entry system based on the channel breakout systems taught by Richard Donchian.

The Turtles were given rules for two different but related breakout systems we called System 1 and System 2. We were given full discretion to allocate as much of our equity to either system as we wanted. Some of us chose to trade all our equity using System 2, some chose to use a 50 percent System 1 and 50 percent System 2 split, and others chose different mixes. The two systems were as follows:

**System 1:** a shorter-term system based on a 20-day breakout

**System 2:** a simpler long-term system based on a 55-day breakout.

## Breakouts

A breakout is defined as the price exceeding the high or low of a particular number of days. Thus, a 20-day breakout would be defined as exceeding the high or low of the preceding 20 days.

Turtles always traded at the breakout when it was exceeded during the day and did not wait until the daily close or the open of the following day. In the case of opening gaps, the Turtles would enter positions on the open if a market opened through the price of the breakout.

## System 1 Entry

Turtles entered positions when the price exceeded by a single tick the high or low of the preceding 20 days. If the price exceeded the 20-day high, the Turtles would buy 1 unit to initiate a long position in the corresponding commodity. If the price dropped one tick below the low of the last 20 days, the Turtles would sell 1 unit to initiate a short position.

System 1 breakout entry signals would be ignored if the last breakout would have resulted in a winning trade. *Note:* For the purposes of this test, the last breakout was considered the last breakout

in the particular commodity regardless of whether that particular breakout was actually taken or was skipped because of this rule. This breakout would be considered a losing breakout if the price subsequent to the date of the breakout moved  $2N$  against the position before a profitable 10-day exit occurred.

The direction of the last breakout was irrelevant to this rule. Thus, a losing long breakout or a losing short breakout would enable the subsequent new breakout to be taken as a valid entry regardless of its direction (long or short).

However, if a System 1 entry breakout was skipped because the previous trade had been a winner, an entry would be made at the 55-day breakout to avoid missing major moves. This 55-day breakout was considered the failsafe breakout point.

At any given point, if a trader was out of the market, there would always be some price that would trigger a short entry and another different and higher price that would trigger a long entry. If the last breakout was a loser, the entry signal would be closer to the current price (i.e., the 20-day breakout) than it would be if it had been a winner, in which case the entry signal probably would be farther away, at the 55 day breakout.

## System 2 Entry

We entered when the price exceeded by a single tick the high or low of the preceding 55 days. If the price exceeded the 55-day high, the Turtles would buy 1 unit to initiate a long position in the cor-

responding commodity. If the price dropped one tick below the low of the last 55 days, the Turtles would sell 1 unit to initiate a short position.

All breakouts for System 2 would be taken whether or not the previous breakout had been a winner.

## Adding Units

Turtles entered single-unit long positions at the breakouts and added to those positions at  $\frac{1}{2}N$  intervals after their initial entry. This

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$\frac{1}{2}N$  interval was based on the actual fill price of the previous order. Thus, if an initial breakout order slipped by  $\frac{1}{2}N$ , the new order would be 1 full  $N$  past the breakout to account for the  $\frac{1}{2}N$  slippage, plus the normal  $\frac{1}{2}N$  unit add interval.

This would continue right up to the maximum permitted number of units. If the market moved quickly enough, it was possible to add the maximum 4 units in a single day.

Here is an example.

### Gold

$N = 2.50$

55-day breakout = 310

First unit added	310.00
Second unit	310.00 + $\frac{1}{2} 2.50$ , or 311.25
Third unit	311.25 + $\frac{1}{2} 2.50$ , or 312.50
Fourth unit	312.50 + $\frac{1}{2} 2.50$ , or 313.75



## Crude Oil

$N = 1.20$

55-day breakout = 28.30

First unit added 28.30

Second unit  $28.30 + \frac{1}{2} 1.20$ , or 28.90

Third unit  $28.90 + \frac{1}{2} 1.20$ , or 29.50

Fourth unit  $29.50 + \frac{1}{2} 1.20$ , or 30.10

## Consistency

The Turtles were told to be very consistent in taking entry signals because most of the profits in a particular year might come

from only two or three large winning trades. If a signal was skipped or missed, this could have a great effect on the returns for the year.

The Turtles with the best trading records consistently applied the entry rules. The Turtles with the worst records and all those who were dropped from the program failed to enter positions consistently when the rules indicated.

## Stops

There is an expression: “There are old traders and there are bold traders, but there are no old bold traders.” Most traders who do not use stops go broke. The Turtles always used stops.

For most people, it is far easier to cling to the hope that a losing trade will turn around than it is to get out of a losing position and admit that the trade did not work out.

Let me make one thing very clear: Getting out of a losing position when the rules of a system dictate doing that is critical. Traders who do not cut their losses will not be successful in the long term. Almost all the examples of trading that got out of control and jeopardized the health of the financial institution, such as Barings and Long-Term Capital Management, involved trades that were allowed to develop into large losses because they were not cut short when they were small losses.

The most important thing about cutting your losses is to have predefined the point where you will get out before you enter a position. If the market moves to your price, you must get out, no exceptions, every single time. Wavering from this method eventually will result in disaster.

*Note:* The reader may have noticed an inconsistency between my comments here and those in Chapter 10, where I noted that adding stops sometimes harms system performance and is not always necessary. The systems outlined previously which work well without stops do have an implicit stop because as the price moves against the position there will come a point where the moving averages will cross and the losses will be limited. So in a sense, there is a stop, it is just not one that is visible or known to the trader. For

most people, however, the psychological comfort of having a price point where they will exit a losing trade is important. This is especially true of beginners. It can be psychologically destabilizing to watch a position go against you without having a clear view of the point where the pain will end.

## Turtle Stops

Having stops did not mean that the Turtles always had actual stop orders placed with the broker.

Since the Turtles carried such large positions, we did not want to reveal our positions or our trading strategies by placing stop orders with brokers. Instead, we were encouraged to have a particular price that when hit would cause us to exit our positions by using either limit orders or market orders.

These stops were nonnegotiable exits. If a particular commodity traded at the stop price, the position was exited each time, every time, without fail.

## Stop Placement

The Turtles placed their stops on the basis of position risk. No trade could incur more than 2 percent risk.

Since  $1N$  of price movement represented 1 percent of account equity, the maximum stop that would allow 2 percent risk would be  $2N$  of price movement. Turtles' stops were set at  $2N$  below the entry for long positions and  $2N$  above the entry for short positions.

To keep total position risk at a minimum, if additional units were added, the stops for earlier units were raised by  $\frac{1}{2}N$ . This generally meant that all the stops for the entire position would be placed at  $2N$  from the most recently added unit. However, in cases in which later units were placed at larger spacing because of either fast markets causing skid or opening gaps, there would be differences in the stops.

Here is an example.

## Crude Oil

$N = 1.20$

55-day breakout = 28.30

	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	25.90
	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	26.50
Second unit	28.90	26.50
	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	27.10
Second unit	28.90	27.10
Third unit	29.50	27.10
	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	27.70
Second unit	28.90	27.70
Third unit	29.50	27.70

Fourth unit	30.10	27.70
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Here is a case in which a fourth unit was added at a higher price because the market opened gapping up to 30.80:

	Entry Price	Stop
First unit	28.30	27.70
Second unit	28.90	27.70
Third unit	29.50	27.70
Fourth unit	30.80	28.40

## Alternative Stop Strategy: The Whipsaw

The Turtles were told about an alternative stop strategy that resulted in better profitability but was harder to execute because it incurred many more losses, which resulted in a lower win/loss ratio. This strategy was called *the Whipsaw*.

Instead of taking a 2 percent risk on each trade, the stops were placed at  $\frac{1}{N}$  for  $\frac{1}{2}$  percent account risk. If a particular unit was stopped out, the unit would be reentered if the market reached the original entry price. A few Turtles used this method with good success.

The Whipsaw also had the added benefit of not requiring the movement of stops for earlier units as new units were added, since the total risk would never exceed 2 percent at the maximum 4 units.

For example, using Whipsaw stops, the crude oil entry stops would be as follows:

## Crude Oil

$N = 1.20$

55-day breakout = 28.30

	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	27.70
	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	27.70
Second unit	28.90	28.30
	<b>Entry Price</b>	<b>Stop</b>
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	<b>Entry Price</b>	<b>Stop</b>
First unit	28.30	27.70
Second unit	28.90	28.30
Third unit	29.50	28.90
Fourth unit	30.10	29.50

## Benefits of the Turtle System Stops

Since the Turtles' stops were based on  $N$ , they adjusted for the volatility of the markets. More volatile markets would have wider stops, but they also would have fewer contracts per unit. This equalized the risk across all entries and resulted in better diversification.

and more robust risk management.

## Exits

There is another old saying: “You can never go broke taking a profit.” The Turtles would not agree with this statement. Getting

out of winning positions too early, that is, “taking a profit” too early, is one of the most common mistakes in trading with trend-following systems.

Prices never go straight up; therefore, it is necessary to let the prices go against you if you are going to ride a trend. Early in a trend, this often can mean watching decent profits of 10 to 30 percent fade to a small loss. In the middle of a trend, it may mean watching a profit of 80 to 100 percent drop by 30 to 40 percent. The temptation to lighten the position to “lock in profits” can be very great.

The Turtles knew that where you took a profit could make the difference between winning and losing.

The Turtle System enters on breakouts. Most breakouts do not result in trends. This means that most of the trades that the Turtles made resulted in losses. If the winning trades did not earn enough on average to offset those losses, the Turtles would have lost money. Every profitable trading system has a different optimal

exit point.

Consider the Turtle System: If you exit winning positions at a  $1N$  profit and exit losing positions at a  $2N$  loss, you will need twice as many winners to offset the losses from the losing trades.

There is a complex relationship among the components of a trading system. This means that you cannot consider the proper exit for a profitable position without considering the entry, money management, and other factors.

The proper exit for winning positions is one of the most important aspects of trading and the least appreciated. However, it can make the difference between winning and losing.

The System 1 exit was a 10-day low for long positions and a 10-day high for short positions. All the units in the position would be exited if the price went against the position for a 10-day breakout.

The System 2 exit was a 20-day low for long positions and a 20-day high for short positions. All the units in the position would be exited if the price went against the position for a 20-day breakout.

As with entries, the Turtles typically did not place exit stop orders but instead watched the price during the day and started to phone in exit orders as soon as the price traded through the exit breakout price.

## These Are Difficult Exits

For most traders, the Turtle System exits were probably the single most difficult part of the Turtle System rules. Waiting for a 10- or 20-day new low often can mean watching 20 percent, 40 percent,

or even 100 percent of significant profits evaporate.

There is a very strong tendency to want to exit earlier. It requires great discipline to watch your profits evaporate so that you can hold on to your positions for the really big move. The ability to maintain discipline and stick to the rules during large winning trades is the hallmark of an experienced successful trader.

## Tactics

The architect Mies van der Rohe, when speaking about restraint in design, once said: “God is in the details.” This is also true of trading systems. There are some important details that can make a significant difference in the profitability of your trading when you are using the Turtle trading rules.

## Entering Orders

As was mentioned before, Richard Dennis and William Eckhardt advised the Turtles not to use stops when placing orders. We were advised to watch the market and enter orders when the price hit our stop price. We also were told that in general it was better to place limit orders than market orders. This is the case because limit orders offer a chance for better fills and less slippage than do market orders.

Any market at all times has a bid and an ask. The bid is the price at which buyers are willing to buy, and the ask is the price at which

~~sellers are willing to sell. If at any time the bid price becomes~~

seuers are willing to sell. If at any time the bid price becomes higher than the ask price, trading takes place. A market order will always fill at the bid or ask when there is sufficient volume, and sometimes it will fill at a worse price for larger orders.

Typically, there is a certain amount of relatively random price movement that occurs, which is sometimes known as the bounce. The idea behind using limit orders is to place your order at the lower end of the bounce instead of simply placing a market order. A limit order will not move the market if it is a small order, and it almost always will move it less if it is a larger order.

It takes some skill to be able to determine the best price for a limit order. However, with practice, you should be able to get better fills using limit orders placed near the market than you do with market orders.

## Fast Markets

At times the market moves very quickly through the order prices, and if you place a limit order, it simply will not get filled. During fast market conditions, a market can move thousands of dollars per contract in just a few minutes.

During those times, the Turtles were advised not to panic and to wait for the market to trade and stabilize before placing their orders. Most beginning traders find this hard to do. They panic and place market orders. Invariably, they do this at the worst possible

time and frequently end up trading on the high or low of the day at the worst possible price.

In a fast market, liquidity temporarily dries up. In the case of a rising fast market, sellers stop selling and hold out for a higher price, and they will not recommence selling until the price stops moving up. In this scenario, the asks rise considerably and the spread between the bid and the ask widens.

Buyers now are forced to pay much higher prices as sellers continue raising their asks, and the price eventually moves so far and so fast that new sellers come into the market, causing the price to stabilize and often to reverse quickly and collapse partway back.

Market orders placed into a fast market usually end up getting filled at the highest price of the run-up, right at the point where the market begins to stabilize as new sellers come in.

The Turtles waited until there was some indication of at least a temporary price reversal before placing our orders, and this often resulted in much better fills than would have been achieved with a market order. If the market stabilized at a point that was past our stop price, we would get out of the market, but we would do so without panicking.

## Simultaneous Entry Signals

Many days there was little market movement and little for us to do besides monitor existing positions. We might go for days without placing a single order. Other days would be moderately busy, with

signals occurring intermittently over the stretch of a few hours. In that case, we would take the trades as they came until they reached the position limits for those markets.

Then there were days when it seemed like everything was happening at once, and we would go from no positions to loaded in a day or two. Often this frantic pace was intensified by multiple signals in correlated markets.

This was especially true when the markets gapped open through the entry signals. You might have a gap opening entry signal in crude oil, heating oil, and unleaded gas on the same day. With futures contracts, it was also extremely common for many different months of the same market to signal at the same time. In those moments it was important to act efficiently and quickly while trying to keep from panicking and issuing market orders since that invariably would have resulted in much worse trade fills.

## Buy Strength, Sell Weakness

If the signals came all at once, we always bought the strongest markets and sold short the weakest markets in a group.

We also would enter only one unit in a single contract month at the same time. For instance, instead of buying February, March, and April heating oil at the same time, we would pick only the contract month that was the strongest and that had sufficient volume and liquidity.

This is very important. Within a correlated group, the best long positions are the strongest markets (which almost always outperform the weaker markets in the same group). Conversely, the biggest winning trades to the short side come from the weakest markets within a correlated group.



The Turtles used various measures to determine strength and weakness. The simplest and most common way to do that was simply to look at the charts and figure out which one “looked” stronger (or weaker) by visual examination.

Some Turtles would determine how many N the price had advanced since the breakout and buy the market that had moved the most in terms of N. Others would subtract the price three months earlier from the current price and then divide by the current N to normalize across markets. The strongest markets had the highest values; the weakest markets had the lowest.

Any of these approaches will work well. The important thing is to have long positions in the strongest markets and short positions in the weakest markets.

## Rolling Over Expiring Contracts

When futures contracts expire, there are two major factors that need to be considered before rolling over into a new contract.

First, there are many instances when the near months trend well but the more distant contracts fail to display the same level of price movement. Do not roll into a new contract unless its price action would have resulted in an existing position.

Second, contracts should be rolled before the volume and open interest in the expiring contract decline too much. How much is too much depends on the unit size. As a general rule, the Turtles rolled existing positions into the new contract month a few weeks before expiration unless the (currently held) near month was performing significantly better than contract months that were farther out.



## Finally

That concludes the Complete Turtle Trading System rules. As you probably are thinking, they are not very complicated.

However, knowing these rules is not enough to make you rich. You have to be able to follow them.

Remember what Richard Dennis said: “I always say that you could publish my trading rules in the newspaper and no one would follow them. The key is consistency and discipline. Almost anybody can make up a list of rules that are 80% as good as what we taught our people. What they couldn’t do is give them the confidence to stick to those rules even when things are going bad.”

Perhaps the best evidence that this is true is the performance of the Turtles: Many of them did not make money. This was the case not because the rules did not work; it happened because they could not and did not follow the rules.

The Turtle rules are very difficult to follow because they depend on capturing relatively infrequent large trends. As a result, many months can pass between winning periods, at times even a year or two. During those periods it is easy to come up with reasons to doubt the system and to stop following the rules: What if the rules don’t work anymore? What if the markets have changed? What if there is something important missing from the rules? How can I be

really sure that this works?

One member of the first Turtle class, who was fired from the program before the end of the first year, suspected early on that information had been withheld intentionally from the group and eventually became convinced that there were hidden secrets that Rich would not reveal. That trader could not face up to the

simple fact that his poor performance was due to his own doubts and insecurities, which resulted in his inability to follow the rules.

Another problem is the tendency to want to change the rules. Many of the Turtles, in an effort to reduce the risk of trading the system, changed the rules in subtle ways that sometimes had the opposite of the desired effect. Here is an example.

Sometimes a trader fails to enter positions as quickly as the rules specify (1 unit every  $\frac{1}{N}$ ). Although this may seem like a more conservative approach, the reality could be that for the type of entry system the Turtles used, adding to positions slowly might increase the chance that a retracement would hit the exit stops, resulting in losses, whereas a faster approach might allow the position to weather the retracement without the stops being hit. This subtle change could have a major impact on the profitability of the system during certain market conditions.

It is important to build the level of confidence you will need to follow a trading system's rules. Whether it is the Turtle System, something similar, or a completely different system, it is imperative that you personally conduct research by using historical trading data. It is not enough to hear from others that a system works; it is not enough to read the summary results from research conducted by others. You must do it yourself.

Get your hands dirty and get directly involved in the research. Dig into the trades, look at the daily equity logs, and get very familiar with the way the system trades and the extent and frequency of the losses.

It is much easier to weather an eight-month losing period if you know that there have been many periods of equivalent length in the last 20 years. It will be much easier to add to positions quickly if you know that adding quickly is a key part of the profitability of the system.

