



# Quantum-Entangled Disrupters Vs. Existing HFT's Sitting Within Dark Pools: Public Markets Arbitrage In The 2030's

## Trading & Execution

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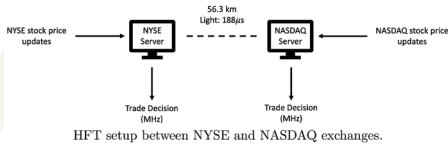
### Stirling Larkin, CIO

In public markets trading, you can either act in advance or respond to changes as they happen and for those who choose to react, speed means everything. Known as High Frequency Traders, or HFT's, these institutional investors meld quantitative technologies, arithmetic and precipitancy, increasingly merging human decision-making with machine efficiency.

Cite:- [How 'Algo'/DMA Traders Backstop Major American, Asian & European Markets: The Past, Present & Future Of Investing Without Surrendering Your Human Edge](#), 8 September 2021

Cite:- [The Unprecedented Reflation Supercycle: Big, Bold, Strategic Moves, Surreptitious Inflation & The Incandescence of "Swarm Trading"](#), 22 February 2021

While speed is crucial, so too is prescience and **Dark Pools** – which started in 1979 when financial regulation changed in the United States that allowed securities listed on a given exchange to be actively traded off the exchange in which it was listed – have grown significantly over the past fifteen years and are now key venues for high-frequency traders. In 2024, these pools handle about eighteen percent of trades on major exchanges like the NYSE, NYSE Arca, BATS, Nasdaq, and CBOE in the United States.

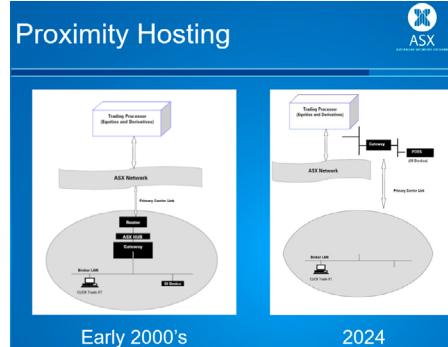


Dark Pools are private exchanges or forums for securities trading that allow institutional investors to buy and sell large quantities of stocks or scrip anonymously, without revealing their intentions to the wider market until after the trade has been executed and doing such is thought to help minimise market impact and provides liquidity. HFT's participate in Dark Pools by using powerful computers and sophisticated algorithms to execute trades at lightning speed, often capitalising on fractional price movements and this cloak of invisibility helps them avoid sudden price swings and execute trades at optimal prices, making Dark Pools a clever counterbalance to the frenetic pace of public exchanges.

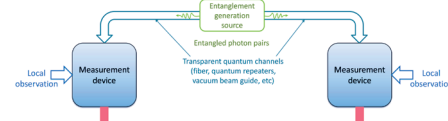
Cite:- [A Short History Of Our Most Maligned Trading Technique](#), 27 August 2016

To complement this, around 2005, "Proximity Hosting" was developed to support high-frequency trading by reducing latency, which is the delay between executing a trade and its completion. To achieve this, stock exchanges offered co-location services, allowing institutional investors to place their servers in the same data centres as the exchanges themselves. This minimises the physical distance that data must travel, enabling trades to be executed in microseconds. By being closer to the exchange,

high-frequency traders can access market data and send orders faster than competitors, giving them a significant advantage in executing trades quickly and efficiently.



So, it is fascinating that a new myriad of Quantum technologies could shake up public markets arbitrage on these on-market proximity hosted servers and private exchanged Dark Pools: traders working at distant stock exchanges could coordinate decisions to buy or sell nearly instantaneously by using entanglement to create a phenomenon called, "quantum telepathy" and all the quantum devices they would need to implement these initiatives already exist. As stated in the celebrated 1964 results of the Nobel Laurette, John Bell, no local hidden variable theory can reproduce the correlated behaviours of entangled particles. His prediction, which is known as the Bell inequality violation and its subsequent experimental verification, completely overturned traditional assumptions of how nature works and made mathematically explicit the departure quantum mechanics makes from the familiar classical world.



This phenomenon was also described by Einstein, Podolsky, and Rosen as "spooky action at a distance", although they are not communicating, entangled particles can display behaviours that seem impossible, hence the term quantum telepathy, or pseudo-telepathy.

One very real-world utility for pseudo-telepathy appears in high-frequency trading, whereby each party is a co-located server at a stock exchange engaged in HFT for the same firm. Each server has access to local information, such as stock price fluctuations at their respective exchange. Now, these stock exchanges are spatially separated by distances ranging from tens of kilometers to thousands of kilometers and the speed of light-delay thus ranges from hundreds of microseconds to tens of milliseconds. However, modern HFT is conducted on timescales as short as microseconds and in the future may even shorten to nanoseconds. No matter how much effort is put into shortening latencies, with these numbers, it is physically impossible for different servers to communicate before making a trade decision. However, there could be a nontrivial globally

optimal pair of trades given a pair of observations to maximise expected returns or some other monetary value that quantum entangled computers could arbitrage and continue to do so on a rapid-fire and repetitive basis before any other market participant or traditional computer would even notice. Distributing entanglement across such a distance may in the 2030's require quantum satellites, which raises geopolitical considerations in the hegemonic race for what's referred to as **Quantum Supremacy**.

Cite:- [Quantum Supremacy: Complicated Technologies Define Realpolitik, Hegemony & Wealth](#), 22 October 2020

Currently oscillating between denial & panic, the Battle Royale that will in fact define and ultimately explicate the rise of China over the West and indeed the World will not be fought-out in the South China Sea or Formosan Straits but rather in the laboratories found in Hangzhou, Santa Barbara (California) and Pancras Square, London.



Cite:- [Cybersecurity for Family Offices: Edge Servers, Airgaps & Common Sense](#), 9 March 2022

As we look to the future, the potential integration of quantum technologies into high-frequency trading could revolutionise the financial markets. By utilising quantum entanglement, traders will synchronise their actions across vast distances almost instantaneously and this will allow servers located at different stock exchanges to make coordinated trading decisions without the delays caused by physical distance, significantly outperforming traditional methods employed during the early 2020's. The technology required for these advancements already exists, suggesting that the next leap in trading efficiency may be just around the corner and this in itself raises important geopolitical considerations, as the race for Quantum Supremacy could redefine global power dynamics, with the nation that first achieves such Supremacy gaining a significant first-mover advantage in controlling financial markets and exerting geopolitical influence, very likely shaping the course of the twenty-first century. ■

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