High-Frequency Financial Trading Firms Turning to Millimeter-Wave Transmissions

Financial markets have always been high-speed, high-return activities. The ability to execute a transaction before your competitors determines who gets the profit from a deal. But we are a long way from the days when ticker tape and phone calls were fast enough. With billions of dollars on the line, markets and traders have invested heavily in technologies to help them rapidly access and analyze data and conclude a sale.

For high frequency trading (HFT) response times have gone from milliseconds to microseconds. In such an environment, even fiber optic connections can be too slow. Microwave connections, with latency measured in nanoseconds, can provide the necessary speed.

HFT grew out of the SEC's 1998 decision to allow electronic exchanges to compete with the NYSE and other marketplaces. By 2010, HFT was accounting for more than 70% of the trades in U.S. equity markets, and a growing percentage of trades in other countries.

Unlike other types of stock strategies that try to profit from large changes in the prices of a stock over a period of time, HFT involves analyzing massive amounts of information and locating even minute opportunities for profit that may have otherwise been overlooked. By executing thousands or millions such transactions daily, billions of dollars in profit can be made. The HFT is usually not interested in holding onto a stock for more than a few seconds and will start each day without any holdings.

Say, for example, there is a momentary difference in the exchange value of the Euro between the London and Frankfurt markets. Even if that difference just lasts a second or two, if the HFT system is fast enough, it can execute trades between those two markets and make a profit. Or if the HFT system identifies one company looking to sell an equity and another looking to buy, it can step in to purchase from the one and sell to the other.

Even if the HFT doesn't make a direct profit on the sale of the equity, it can still make money since exchanges will typically pay the HFT a small amount, say ¼ cent per share, for the transaction. All those pennies add up. According to Tabb Group, a financial markets research and strategic advisory firm, by 2008 traders earned $21 Billion in profits off HFT.

In their quest for secure, high bandwidth, low latency connections, HFT firms are increasingly turning to millimeter-wave transmission systems to connect their data centers to the exchanges.

Because their high frequency provides a large bandwidth, millimeter-wave systems are ideal for carrying huge quantities of data needed for HFT.

An example of this in the HFT arena is Renaissance Electronics Corp.'s recently upgraded versions of its Extremely Low Latency GigaLink Light Speed radios. These millimeter-wave transmitter/receiver units are available in light licensed and unlicensed versions for the U.S. European and Japanese markets. The light licensed U.S. and European models operate in the 71 - 76/81 - 86 GHz bands and can transmit over distances up to 8200 meters (5 miles). The lower power unlicensed radios at 60 GHz can be used over shorter distances, typically up to 1 km.

Because of the high frequency, these links operate with a full duplex throughput of 1.25 Gbps and higher, thereby offering plenty of bandwidth for the millions of daily transactions.

A trading company can install one if these microwave radio links on top of its data center in New Jersey and use it to create a direct connection to Manhattan. Or, if the distance is too great for a single link, or if there are obstructions that would block the signal, a series of radio links can be used to relay the signal. By using microwave instead of fiber optic cables, an HFT firm can establish a much shorter path to the marketplace, reducing latency and so it can gather information and execute trades faster.

—Renaissance Electronics Corp.
rec-usa.com

Tower Top RF Electronics for Wireless Infrastructure Should Exceed $4.5B by 2017

As the mobile network struggles to cope with the growing level of traffic and pressures on CAPEX, the RF electronics of a typical base station design are subject to great innovation, in the form of tower mounted amplifiers, remote radio heads, and active antennas.

Tower mounted amplifiers represent one of the best values for improved base station performance for service providers. Balancing the system link budget equation can now be easily accomplished at nominal cost, however, remote radio heads, will represent a threat to TMA market growth. In turn, remote radio heads (RRHs) have become one of the most important subsystems of today's new distributed base stations. The remote radio head contains the base station's RF circuitry plus analog-to-digital/digital-to-analog converters and up/down converters. Active antennas, especially for wireless infrastructure base station applications, utilize the latest technology and will allow beam forming and shaping that will help today's crowded conditions in a data-rich signal environment. Active antennas could themselves affect the

RRH market as that function is now incorporated into the active antenna.

Lance Wilson, research director for mobile networks at ABI Research, states: "Tower top active RF electronics will become more important as LTE rolls out over the next few years. This will be especially true for remote radio heads and active antennas."

All three of the above major RF electronics sub-systems have therefore become intertwined as functions start to converge. This data package details tower mounted amplifier and remote radio head revenue and shipments by air interface, frequency, technology, type (TMA), output power (RRH), and configuration. Total revenue, shipments, and ASP trends are also presented for the period 2012 - 2017. In addition, the study reports vendor market share for 2012.

Active antennas, which are just emerging, are examined for 2012 - 2017 sales and ASP trends. The effect that active antennas could have on RRH sales is also reviewed for 2012 and 2017. This market data package will also be important for RF component manufacturers, base station OEMs, wireless infrastructure sub-assembly builders, and service operators.

—ABI Research
abiresearch.com

By End of 2012 Nearly 20% of Phones Shipped will Have Facial Recognition Capability

By the end of 2012, almost 20% of annual smartphone shipments will include facial recognition capabilities. In five years' time, shipments of smartphones and tablets with the technology will increase to 665 million annually. Currently, only Google's Ice Cream Sandwich and Jelly Bean mobile operating systems support the technology in significant volumes. The Samsung Galaxy SIII is one of the most notable smartphones to feature this technology. Over the next two to three years, many more operating systems and mobile OEMs will incorporate the technology.

Facial recognition has been on the technology radar for some time. It was developed in the 1960s by three scientists: Woody Bledsoe, Helen Chan Wolf, and Charles Bisson. Historically, the major challenge for the technology in mobile devices has been incorporating an accurate enough sensor (camera) and a powerful enough processor to undertake the complex algorithms while limiting power consumption. Thanks to major technology advancements, this has changed.

—ABI Research
abiresearch.com