

SUN MANAGEMENT, LLC

4G-LTE: WIRELESS COMMUNICATION TECHNOLOGIES

A PATENT PORTFOLIO ACQUISITION OPPORTUNITY

OVERVIEW OF THE OPPORTUNITY

Investments Group has been retained by Sun Management, LLC to broker the sale of a patent portfolio (the “Portfolio”) that relates to wireless communications technologies and 4G/LTE telecommunications in particular. Several methods and devices that perform them are presented in the Portfolio covering a range of techniques for managing the transmission and reception of data fragments, generating synchronization information from received signals in communication devices, and antenna selection.

The technology presented in the Portfolio may also be applied to various types of mobile devices and wireless access points such as WAN data, cellular telephony and Wi-Fi. These methods appear requisite to both base stations and mobiles that perform channel management and optimization steps via LTE in particular. This \$16.5 billion market is the growth sector for wireless communications.¹

The Portfolio consists of three (3) issued U.S. Patents, one (1) pending U.S. Patent Application, and one (1) abandoned U.S. Patent Application. At this time, the Portfolio is being offered to select operating companies, as well as patent acquisition and financing organizations that participate in the relevant markets and related industries. A summary of the assets in the Portfolio is shown below.

PATENT NO.	TITLE	SERIAL NO.	FILING DATE	ISSUE DATE
8,363,765	METHOD AND APPARATUS FOR PROCESSING RECEIVED SIGNALS FOR SYNCHRONIZATION IN COMMUNICATION DEVICES	11/856,684	09/17/07	01/29/13
8,417,205	ANTENNA SELECTION SCHEME FOR MULTIPLE ANTENNAE	11/856,685	09/17/07	04/19/13
8,386,667	TECHNIQUES FOR MANAGING THE TRANSMISSION AND RECEPTION OF DATA FRAGMENTS	12/198,860	08/26/08	02/26/13
PENDING	N/A	13/776,698	02/25/13	-
ABANDONED	N/A	13/752,274	01/28/13	-

¹ <http://www.infonetics.com/pr/2012/1Q12-2G-3G-4G-LTE-WiMAX-Infrastructure-Market-Highlights.asp>

SUN MANAGEMENT, LLC

4G-LTE: WIRELESS COMMUNICATION TECHNOLOGIES

A PATENT PORTFOLIO ACQUISITION OPPORTUNITY

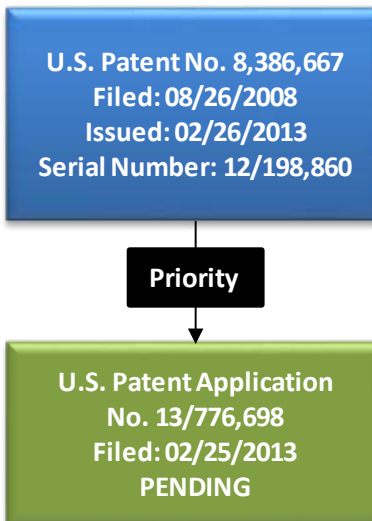
U.S. PATENT NO. 8,386,667 – *TECHNIQUES FOR MANAGING THE TRANSMISSION AND RECEPTION OF DATA FRAGMENTS*

The '667 Patent, filed on August 26, 2008, teaches techniques for managing the transmission and reception of data fragments that contain one or more data blocks using a single receipt or transmission sync timer. As shown in the family chart below, U.S. Patent Application No. 13/776,698 claims benefit from the '667 Patent and is currently pending. Significant allowed matter is present in the '698 application at this time and available upon request.

An important embodiment of the '667 Patent details a method based on these important steps:

1. Use of a calculated timer to set how rapidly windows of data fragments might be deemed overdue;
2. Receiving and processing fragments of data must be processed in a sequence to ensure they are handled in order and generate a functional data processing network regardless of whether it is voice or data; out of order information can be handled, but a lack of information may not be;
3. Monitoring a timer to set priority when a segment is not ready to process after it meets a condition;
4. Using a timer to decide when a particular data unit has timed out

A chief advantage of the '667 Patent is that only a single timer is needed for the management of transmitted and/or received fragments and data blocks for each connection. Memory and operating requirements may also be lowered on the operating system, especially in a loaded base station. Another advantage of the patented technology is that the systems using these methods scale well for various types of receivers, regardless of their roaming patterns or the orientation and type of base stations used to receive and backhaul their traffic.



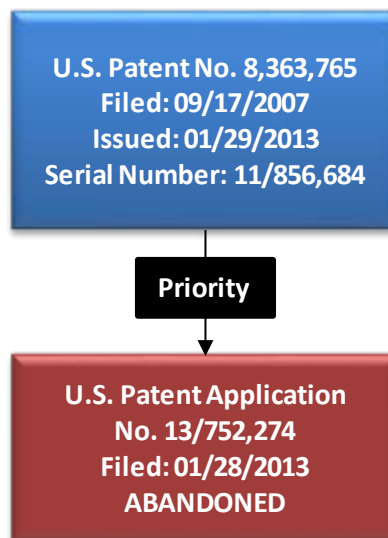
SUN MANAGEMENT, LLC

4G-LTE: WIRELESS COMMUNICATION TECHNOLOGIES

A PATENT PORTFOLIO ACQUISITION OPPORTUNITY

U.S. PATENT NO. 8,363,765 – *METHOD AND APPARATUS FOR PROCESSING RECEIVED SIGNALS FOR SYNCHRONIZATION IN COMMUNICATION DEVICES*

The '765 Patent, filed on September 17, 2007, provides systems and methods for processing received signals in communication systems, whether wireless or wire-line. Any analog communication scheme is supported. High speed communication systems require rapid decisions about how to synchronize the signals they receive to keep data rates high and signals robust. Various embodiments of the '765 Patent can be applied to communication applications, biological applications, medical applications, electronic applications, and any other applications where a synchronization algorithm can be beneficially used in communications. Most interestingly, the synchronization method taught involves the use of an adjustable gain to an analog signal – wireless or wireline – and how synchronization information is needed to process complicated multiplex bit encoding methods so a preamble can be processed per mathematical necessity (e.g. from most to least significant bit.)



These patented methods include receiving an analog signal, providing a fixed gain to the analog signal to generate a modified analog signal, converting the modified analog signal to a digital signal, extracting one or more sign bits from the digital signal, and generating synchronization information as a function of the one or more sign bits and one or more number bits. The patented system includes a fixed gain module that provides a fixed gain to a received analog signal to generate a modified analog signal, as is often required to adapt to a changing environment. The system also includes an analog-to-digital converter to convert the modified analog signal to a digital signal and extraction module to extract one or more sign bits from the digital signal. These sign bits are essential parts of the signal code needed to carry information in these products. In addition, synchronization information via an extraction module is used to generate needed information via necessary sign bits in any desired signaling system.

Most importantly, the explicit inclusion of the patented technology in OFDM, CDMA, LTE, and GSM derivatives is supported via multiple dependent claims.

SUN MANAGEMENT, LLC

4G-LTE: WIRELESS COMMUNICATION TECHNOLOGIES

A PATENT PORTFOLIO ACQUISITION OPPORTUNITY

U.S. PATENT NO. 8,417,205 – ANTENNA SELECTION SCHEME FOR MULTIPLE ANTENNAE

The '205 Patent was also filed on September 17, 2007 and provides methods and systems to more closely optimize the selection of an antenna in wireless communication systems.

U.S. Patent No. 8,417,205
Filed: 09/17/2007
Issued: 04/09/2013
Serial Number: 11/856,685

The patented technology, which is based on a quality indicator, includes monitoring at least one antenna of a plurality of possible antennae, whether on the base station or mobile end of the communication via a preamble segment of the transmission. More interesting, during this preamble period a quality of signal indicator is used to select and store for later use an antenna to use during the transmission of a frame of data whether voice, video, or digital data. The method further includes storing a derived quality indicator and, based upon that stored quality indicator, selectively switching to a selected antenna from a plurality of possible antennae. As each frame can constitute a different type of communications, this technique is equally important to 4G cellular voice or Wi-Fi directional data.

Storage of pre-existing “known-good” routes for wireless communications is an equally important feature for wireless providers who use redundant directional paths to backhaul wireless communications regardless of payload.

REPRESENTATIVE CLAIMS

A first representative claim of the Portfolio, taken from the '765 Patent, is shown below. In particular, this claim teaches the necessary step of adjusting the gain on a received signal after it has been digitally sampled in order to synchronize the analog signal.

'765 Claim No. 1:

1. A method to generate synchronization information from a received analog signal, the method comprising:
 - receiving the analog signal in a receiver;
 - providing a fixed gain to the analog signal to generate a modified analog signal;
 - converting the modified analog signal to a digital signal;
 - extracting one or more sign bits from the digital signal to obtain a subset of sign bits; and
 - generating synchronization information as a function of the one or more sign bits and the subset of the sign bits of the digital signal, wherein the subset of the sign bits are extracted in priority from a most significant bit towards a least significant bit.

SUN MANAGEMENT, LLC

4G-LTE: WIRELESS COMMUNICATION TECHNOLOGIES

A PATENT PORTFOLIO ACQUISITION OPPORTUNITY

Note that the claim does not require a particular type of sign bits or modulation convention, and more importantly that the method is equally important to radio base stations as it is to mobile or ad-hoc networks.

Another important and representative claim of the Portfolio is taken from the '205 Patent. Claim 10 of the '205 Patent teaches an innovative method of antenna selection among more than one antennae as might be needed in a base station or beam-forming (e.g. MIMO) environment.

In these circumstances, measuring a quality of the incoming signal during an early pre-amble phase allows the method to indicate a need to switch to a better antenna available using a measured quality of the performance of that antenna. Thus, the claim teaches a method where an antenna is selected dynamically as needed while sampling a signal, an important quality for any dynamic 4G wireless network.

'205 Claim No. 10:

10. A method to select an antenna among a plurality of antennas based on at least one quality indicator, the method comprising:
monitoring each of the antennas during a fraction of at least one preamble period of a frame to derive at least one quality indicator corresponding to the each of the antennas;
storing the at least one quality indicator derived from monitoring the each of the antennas;
comparing the stored at least one quality indicator
with the at least one quality indicator corresponding to an antenna currently being used,
wherein the antenna currently being used is one of the antennas;
and selectively switching to a selected antenna of the antennas after a number of frames when the stored at least one quality indicator corresponding to the selected antenna is significantly better than the at least one quality indicator corresponding to the antenna currently being used,
wherein the number of frames equals or exceeds the number of antennas.