

---

**Petitioner  
Ericsson Inc. and  
Telefonaktiebolaget LM Ericsson**

U.S. Patent No. 7,787,431

IPR2015-01664

October 6, 2016

Andrew Lowes

Clint Wilkins

---

# Overview of '431 patent – directed to three aspects

(1) core-band and (2) primary preamble

## (1) Core-band

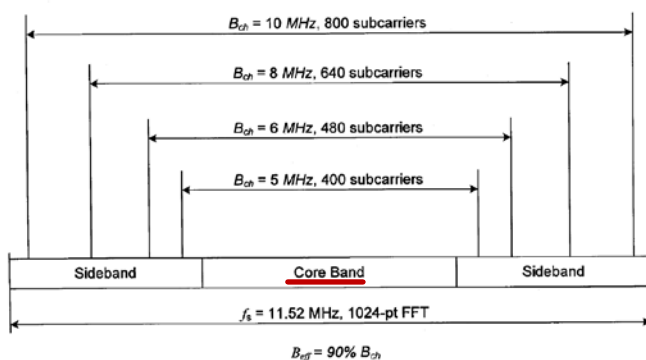


FIG. 6

is realized through the use of a core-band (CB), substantially centered at the operating center, defined as a frequency segment that is not greater than the smallest operating channel bandwidth among the spectral bands that the receiver is designed to

('431 patent, 4:67-5:4, cited in Petition, p. 22)

## (2) Primary preamble properties

1. Its autocorrelation exhibits a relatively large ratio between the correlation peak and sidelobe levels.
2. Its cross-correlation coefficient with another EP sequence is significantly small with respect to the power of the EP sequences.
3. Its peak-to-average ratio is relatively small.
4. The number of EP sequences that exhibit the above three properties is relatively large.

('431 patent, 5:28 claims 8 and 18))

# Overview of '431 patent – directed to three aspects

## (3) Variable bandwidth

### (3) Variable-bandwidth multi-carrier systems

The data subcarriers can be arranged into groups called subchannels to support scalability and multiple-access. Each subchannel may be set at a different power level. The subcarriers forming one subchannel may or may not be adjacent to each other. Each user may use some or all of the subchannels.

('431 patent, 3  
in Petition, p.  
Petitioner Rep

In some embodiments, the variable channel bandwidth is realized by adjusting the number of usable subcarriers. In the

('431 patent,  
Petition, p. 11  
Reply, p. 6)

The variable channel bandwidth is realized by adjusting the number of usable subcarriers, whose spacing is set constant.

('431 patent,  
in Petition, p.

## Overview of Challenge

- Claims 8-12 and 18-22 challenged as obvious in view of Yamaura, Hwang, and Zhuang
- Trial instituted on all challenged claims

Reference	Patents/Printed Publications	Exhibit
Dulin	U.S. Patent Pub. 2002/0055356 A1 (May 9, 2002)	1002
Yamaura	U.S. Patent No. 7,782,750 B2 (August 24, 2010)	1003
Zhuang	U.S. Patent No. 7,426,175 B2 (September 16, 2008)	1004
Hwang	I. Hwang et al., <i>A New Frame Structure for Scalable OFDMA Systems</i> , (March 11, 2004)	1005

(Decision on Institution, pp. 4 and 21)

# Summary of claim 8

8. A cellular base station comprising:  
circuitry configured to transmit a broadcast channel in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups, wherein each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band,  
wherein properties of the primary preamble comprise:  
an autocorrelation having a large correlation creak with respect to sidelobes;  
a cross-correlation with other primary preambles having a small cross-correlation coefficient with respect to power of other primary preambles; and  
a small peak-to-average ratio; and  
wherein a large number of primary preamble sequences exhibit the properties; and  
circuitry configured to transmit control and data channels using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band

(1) Core-band

(2) Primary Preamble

(Discussed *inter alia* 9-12)

(3) Variable bandwidth multi-subcarrier systems

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.