

UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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Intel Corporation  
Petitioner,

v.

ParkerVision, Inc.  
Patent Owner

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Case No. IPR2020-01265  
Patent No. 7,110,444

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**PETITIONER'S ORAL HEARING DEMONSTRATIVES**

**United States Patent and Trademark Office  
Before the Patent Trial and Appeal Board**

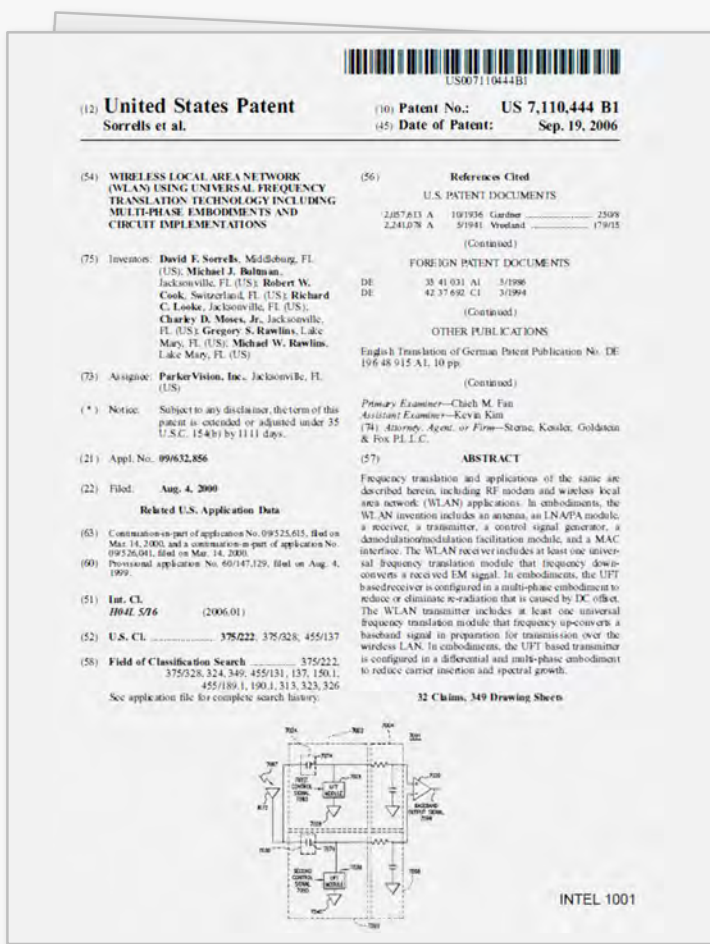
**Intel Corporation, Petitioner,  
v.  
ParkerVision, Inc., Patent Owner.**

**IPR2020-01265**

**Petition for *Inter Partes* Review of U.S. Patent No. 7,110,**

November 1, 2021

# The '444 Patent



(10) Patent No.: US 7,110,444 B1  
 (45) Date of Patent: Sep. 19, 2006

(54) WIRELESS LOCAL AREA NETWORK (WLAN) USING UNIVERSAL FREQUENCY TRANSLATION TECHNOLOGY INCLUDING MULTI-PHASE EMBODIMENTS AND CIRCUIT IMPLEMENTATIONS

(75) Inventors: David F. Sorrells, Middleburg, FL (US); Michael J. Bultman, Jacksonville, FL (US); Robert W. Cook, Switzerland, FL (US); Richard C. Looke, Jacksonville, FL (US); Charley D. Moses, Jr., Jacksonville, FL (US); Gregory S. Rawlin, Lake Mary, FL (US); Michael W. Rawlin, Lake Mary, FL (US)

(73) Assignee: ParkerVision, Inc., Jacksonville, FL (US)

(\* ) Notice: Subject to any disclaimer, this patent is extended or adjusted under 35 U.S.C. 154(b) by 1111 days.

(21) Appl. No.: 09/632,856

(22) Filed: Aug. 4, 2000

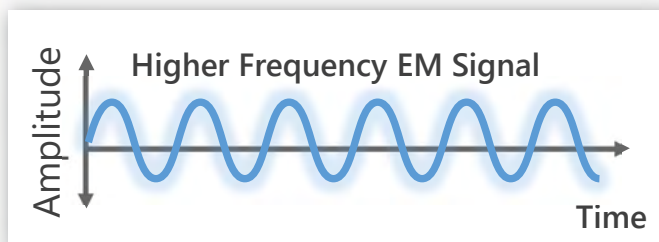
## Technology Background: Up-Conversion

- Wireless devices communicate with each other by transmitting and receiving electromagnetic (EM) signals.
- Before transmission, information exists as a low frequency “baseband signal,” which is shifted to a higher frequency “radio frequency” or “RF” signal.
- Shifting a signal from a lower frequency to a higher frequency is called “up-conversion.”

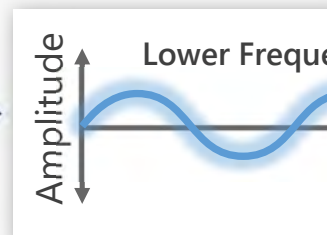
Paper 3 (Petition) at 10-16.

## Technology Background: Down-Conversion

- Received RF signals are shifted back down to a lower frequency to process the received information.
- Shifting a signal from a higher frequency to a lower frequency is called “down-conversion.”



*Down-conversion*



Paper 3 (Petition) at 15-16.

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