

# EXHIBIT 18



(12) **United States Patent**  
**Sorrells et al.**

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- (54) **APPLICATIONS OF UNIVERSAL FREQUENCY TRANSLATION**
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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.<sup>7</sup>** ..... **H04B 1/26; H04B 1/40**

(52) **U.S. Cl.** ..... **455/323; 455/313; 327/113**

(58) **Field of Search** ..... **327/113; 455/313, 455/323, 333**

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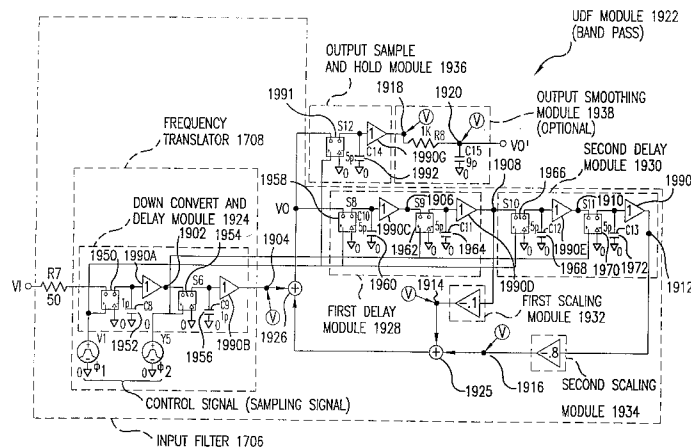
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(57) **ABSTRACT**

Frequency translation and applications of same are described herein. Such applications include, but are not limited to, frequency down-conversion, frequency up-conversion, enhanced signal reception, unified down-conversion and filtering, and combinations and applications of same.

**68 Claims, 58 Drawing Sheets**



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