



US006400310B1

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

(10) **Patent No.:** **US 6,400,310 B1**  
(45) **Date of Patent:** **Jun. 4, 2002**

(54) **METHOD AND APPARATUS FOR A TUNABLE HIGH-RESOLUTION SPECTRAL ESTIMATOR**

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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.

(21) Appl. No.: **09/176,984**

(22) Filed: **Oct. 22, 1998**

(51) **Int. Cl.**<sup>7</sup> ..... **G10L 11/00**; G01S 13/58

(52) **U.S. Cl.** ..... **342/115**; 342/45.3; 342/84; 342/104; 704/270

(58) **Field of Search** ..... 704/500, 270; 367/43, 67, 7, 90; 342/453, 84, 104-117

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(57) **ABSTRACT**

A high resolution spectral estimator (HREE) filter coupled to a spectral plotter processes either Doppler frequencies provided from the output of a pulse-Doppler radar or a frequency based output provided by a Fourier transformer coupled to a sensing device to allow the spectral plotter to determine the power frequency spectrum of either the pulse-Doppler radar output or sensing device output. The HREE filter preferably comprises a bank of first order filters tuned to a pre-selected frequency, a covariance estimator coupled to the filter bank for estimating filter covariances, and a decoder coupled to the covariance estimator for producing a plurality of filter parameters. Further, it is preferable that the filters comprising the filter bank be adjustable to permit their being tuned to a desired frequency based on a priori information.

**44 Claims, 10 Drawing Sheets**

