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[54] DIGITAL RANGE MEASUREMENT SYSTEM

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[56] References Cited

U.S. PATENT DOCUMENTS

4,513,401	4/1985	Ottsen et al.	367/6
4,516,226	5/1985	Peynaud et al.	367/127

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[57] ABSTRACT

A digital range measuring system utilizes a digital signal processing processor in connection with a precision time standard to generate a unique, characterizing frequency signal for transmission through a medium such as a body of water, at precisely known time intervals wherein a received signal at a second, different DRMS performs a predetermined number of frequency domain analyzations on the received signal to detect the presence of a known, unique frequency signal representative of at least one originating DRMS. Each of the frequency domain analyzations are time identified so that the one frequency domain analyzation during which the presence of the known frequency is detected is used to determine the time of detection. A personal computer is coupled to the digital signal processing processor and uses the time of detection in calculating the range between the receiver and the originating transmission.

5 Claims, 3 Drawing Sheets