

United States Patent [19]

Murphy et al.

[54] ATOMIC CLOCK AUGMENTED GLOBAL POSITIONING SYSTEM RECEIVERS AND GLOBAL POSITIONING SYSTEM INCORPORATING SAME

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- [21] Appl. No.: 530,553
- [22] Filed: Sep. 19, 1995
- [51] Int. Cl.⁶ H04B 7/185; G01S 5/02
- [58] Field of Search 342/357; 364/449.7

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US005736960A

[11] Patent Number: 5,736,960

[45] Date of Patent: Apr. 7, 1998

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[57] ABSTRACT

A GPS radio navigation system utilizes an atomic clock in each user's GPS receiver station and a ground reference station located at a fixed, precisely known position which determines GPS time from satellite information and transmits an absolute time signal together with time-of-flight information over a communications path of precisely known length to the user stations, each at a fixed position. Once the atomic clock in a GPS receiver has been set to the precise GPS time, the user station is free to maneuver for an extended period of time during which its position is calculated from pseudorange and time information received from as few as three satellites and the time maintained by its atomic clock.

14 Claims, 4 Drawing Sheets





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