



US005455587A

# United States Patent [19] Schneider

[11] Patent Number: **5,455,587**

[45] Date of Patent: **Oct. 3, 1995**

[54] **THREE DIMENSIONAL IMAGING  
MILLIMETER WAVE TRACKING AND  
GUIDANCE SYSTEM**

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[21] Appl. No.: **97,298**

[22] Filed: **Jul. 26, 1993**

[51] Int. Cl.<sup>6</sup> ..... **G01S 13/00**

[52] U.S. Cl. .... **342/62; 244/3.14**

[58] Field of Search ..... **342/62; 244/3.11,  
244/3.12, 3.14, 3.17, 3.19**

[56] **References Cited**

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7 Claims, 4 Drawing Sheets

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[57] **ABSTRACT**

An improved imaging system. The inventive imaging system (10) is adapted to transmit a plurality of first radar signals at millimeter wave frequencies at an area including an object along with background clutter. The return signals are processed to provide a three dimensional image for applications demanding visibility through fog, haze, smoke and other obscurants. Such applications include enhanced vision for helicopters, ships, buses, trucks, traffic observation stations for an intelligent highway or security cameras for plants and military installations. In a guidance system application, for example, the inventive system would include an electronically scanning antenna (12) to provide range and amplitude signals representative of a target area. The range and amplitude signals (18, 20) are compared to stored signals (26, 30) to create the three dimensional image. The stored signals are selected for comparison based on the dive angle of the missile (28, 32). The three dimensional image is then processed (22, 24, 34, 36, 38, 40) to derive guidance commands for the missile.

