



US007227494B2

(12) **United States Patent**
Aker

(10) **Patent No.:** **US 7,227,494 B2**
(45) **Date of Patent:** ***Jun. 5, 2007**

(54) **VEHICULAR TRAFFIC SURVEILLANCE
DOPPLER RADAR SYSTEM**

(75) Inventor: **John L. Aker**, Estero, FL (US)

(73) Assignee: **Applied Concepts, Inc.**, Plano, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

4,003,049 A 1/1977 Sterzer et al.
4,052,722 A 10/1977 Millard
4,072,945 A 2/1978 Katsumata et al.
4,123,719 A 10/1978 Hopwood et al.
4,214,243 A 7/1980 Patterson
4,219,878 A 8/1980 Goodson et al.
4,282,524 A 8/1981 Eymann et al.
4,435,712 A 3/1984 Kipp

This patent is subject to a terminal disclaimer.

(Continued)

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **11/279,383**

FR 2747788 A 10/1997

(22) Filed: **Apr. 11, 2006**

(65) **Prior Publication Data**

US 2006/0181449 A1 Aug. 17, 2006

Related U.S. Application Data

(63) Continuation of application No. 11/059,476, filed on Feb. 16, 2005, now Pat. No. 7,038,614.

(51) **Int. Cl.**
G01S 13/93 (2006.01)
G01S 13/58 (2006.01)

(52) **U.S. Cl.** **342/114**; 342/196; 342/107;
342/115; 342/104; 342/72

(58) **Field of Classification Search** 342/70,
342/72, 107, 109, 104, 196, 114, 115; 340/435,
340/903, 436

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,680,085 A 7/1972 Del Signore
3,750,172 A 7/1973 Tresselt
3,760,414 A 9/1973 Nicolson
3,761,908 A 9/1973 Gehman
3,898,655 A 8/1975 Tresselt

OTHER PUBLICATIONS

Skolnik, Merrill I. "Introduction to Radar System," 1962, pp. 98-99, McGraw-Hill Book Company, Inc., New York.

(Continued)

Primary Examiner—Dan Pihulic

(74) *Attorney, Agent, or Firm*—Scott T. Griggs; Griggs Bergen LLP

(57) **ABSTRACT**

A vehicular traffic surveillance Doppler radar system and method for use of the same are disclosed. In one embodiment, the system comprises a modulation circuit portion for generating modulated FM signals. An antenna circuit portion transmits the modulated FM signals to a target and receives the reflected modulated FM signals therefrom. A ranging circuit portion performs a quadrature demodulation on the reflected modulated FM signals and determines a range measurement based upon phase angle measurements derived therefrom.

20 Claims, 9 Drawing Sheets

