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United States Patent [19]

Tsou et al.

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[54] RADAR SIGNAL PROCESSOR

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[73] Assignee: **TRW Inc.**, Redondo Beach, Calif.

[21] Appl. No.: **173,540**

[22] Filed: **Dec. 23, 1993**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 117,266, Sep. 7, 1993, which is a continuation-in-part of Ser. No. 767,953, Sep. 30, 1991, Pat. No. 5,315,303.

[51] **Int. Cl.**[6] **G01S 13/532**

[52] **U.S. Cl.** **342/192**; 342/110

[58] **Field of Search** 342/109, 110, 342/114, 115, 128, 175, 192, 196; 364/724.01

[56] **References Cited**

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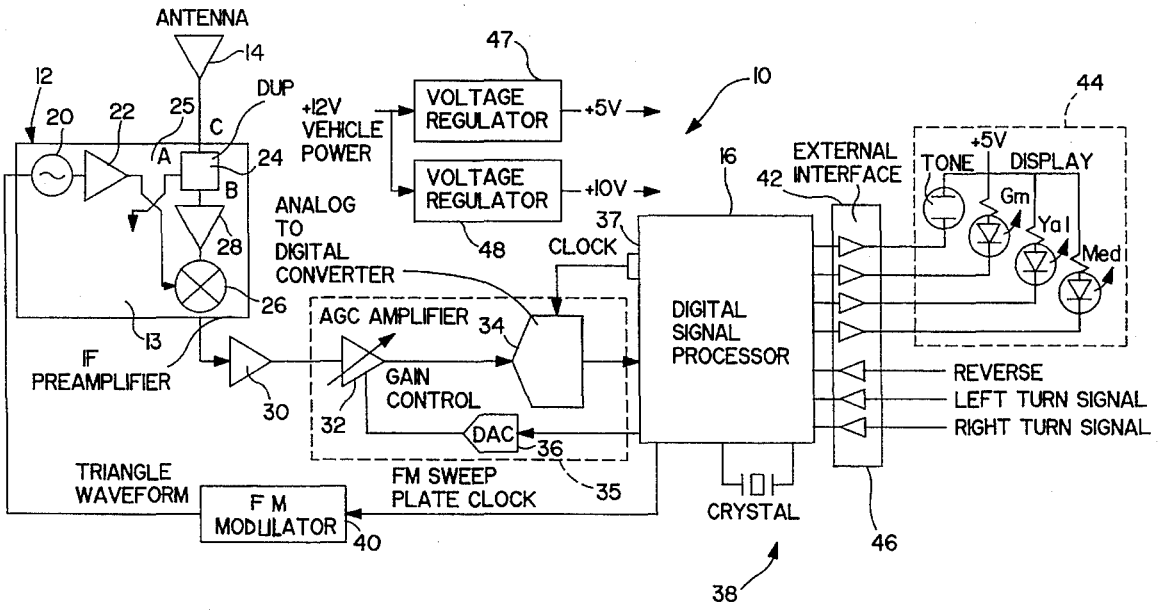
Primary Examiner—Daniel T. Pihulic

[57] **ABSTRACT**

A radar system includes a radar transceiver for generating transmit signals and for receiving signals reflected by targets. The radar system includes a mixer for combining the transmit signals and the reflected signals into a mixer signal. A radar signal processor includes a sampling device, connected to the mixer, for sampling the mixer signal and for generating a sampled mixer signal. A spectrum estimation device, connected to the sampling device, generates a range profile signal including a plurality of range bins each containing a magnitude of a spectral component. A threshold device, connected to the spectrum estimation device, generates a target space array from the range profile signal. A target decision device, connected to the threshold device, generates estimated range and speed signals for a closest target from the target space array.

24 Claims, 18 Drawing Sheets



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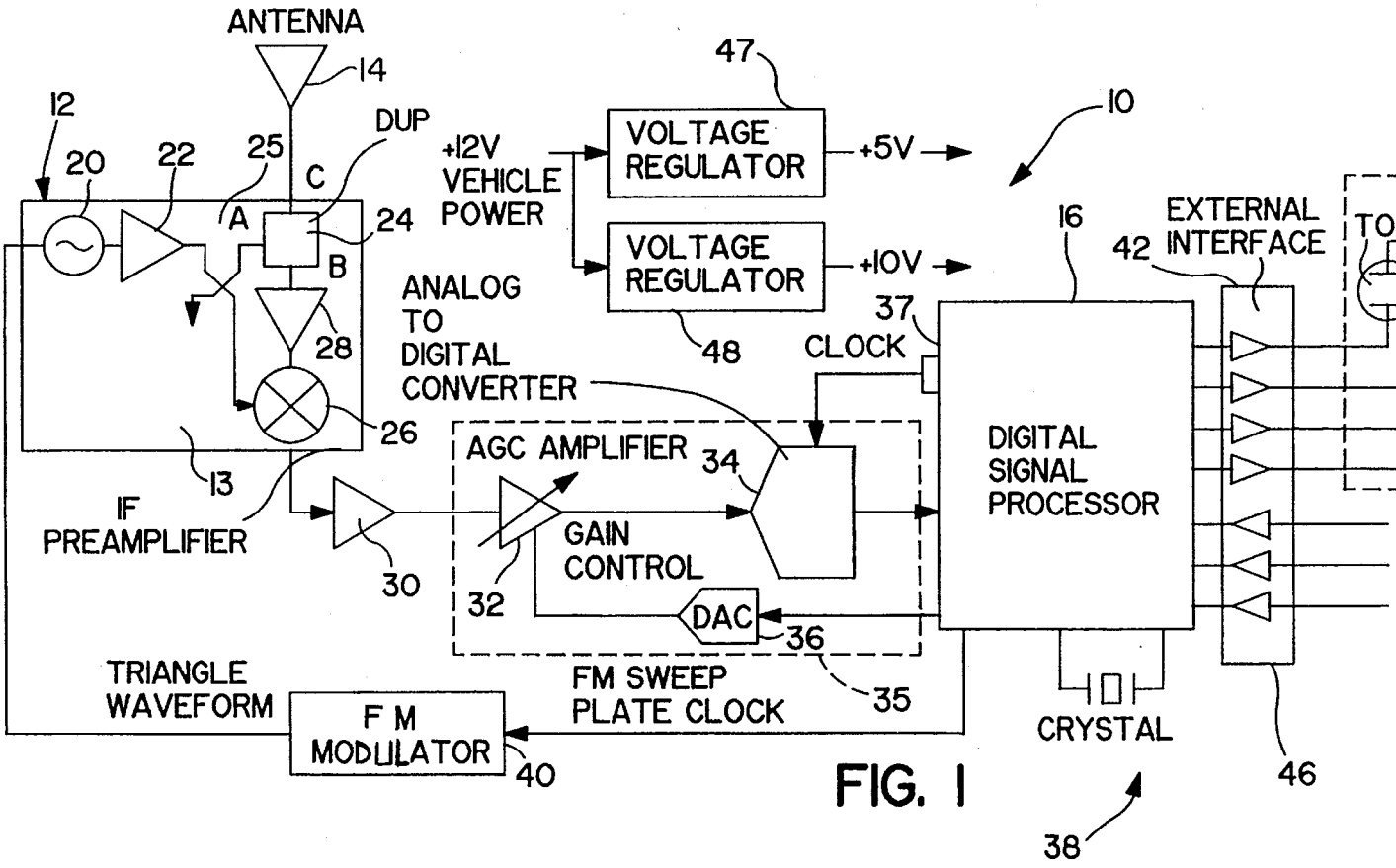

FIG. 1

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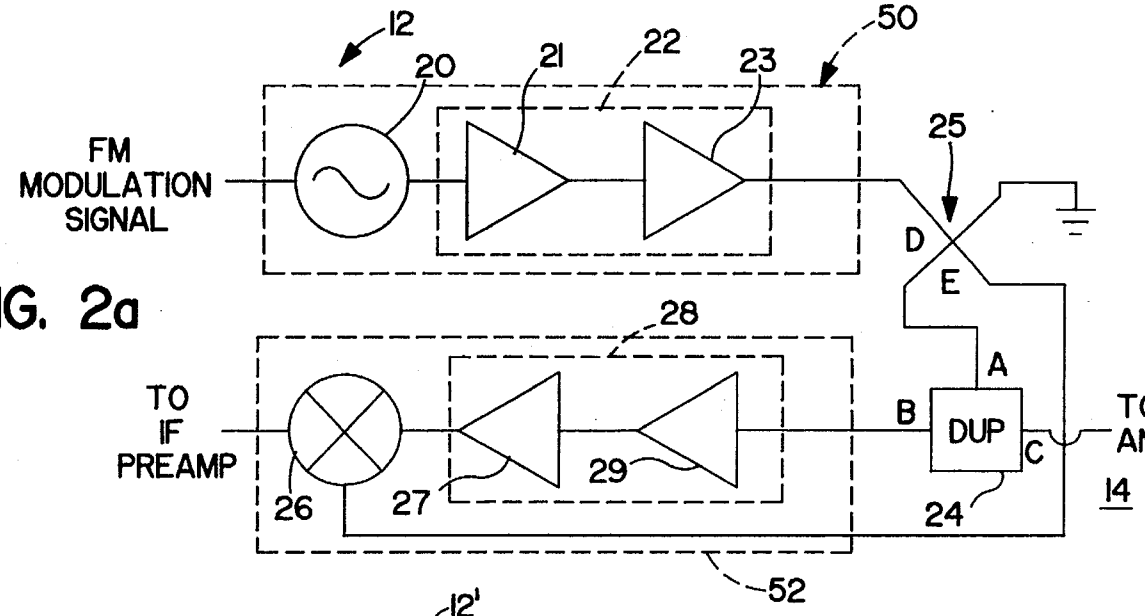

FIG. 2a

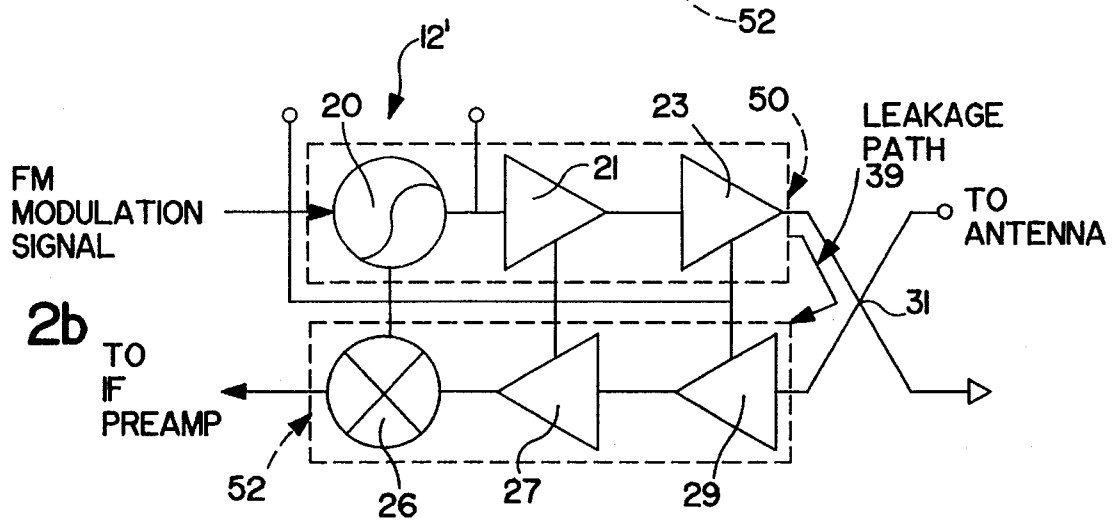

FIG. 2b

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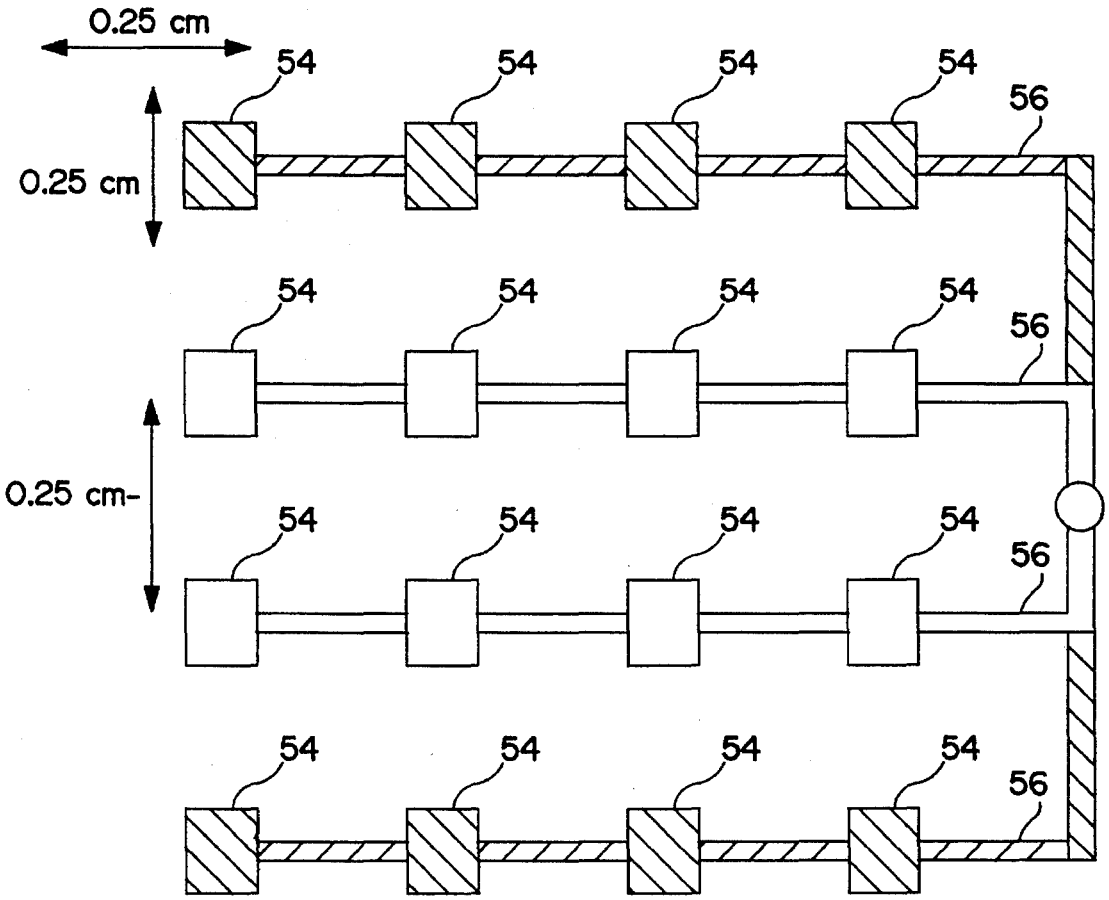

FIG. 3

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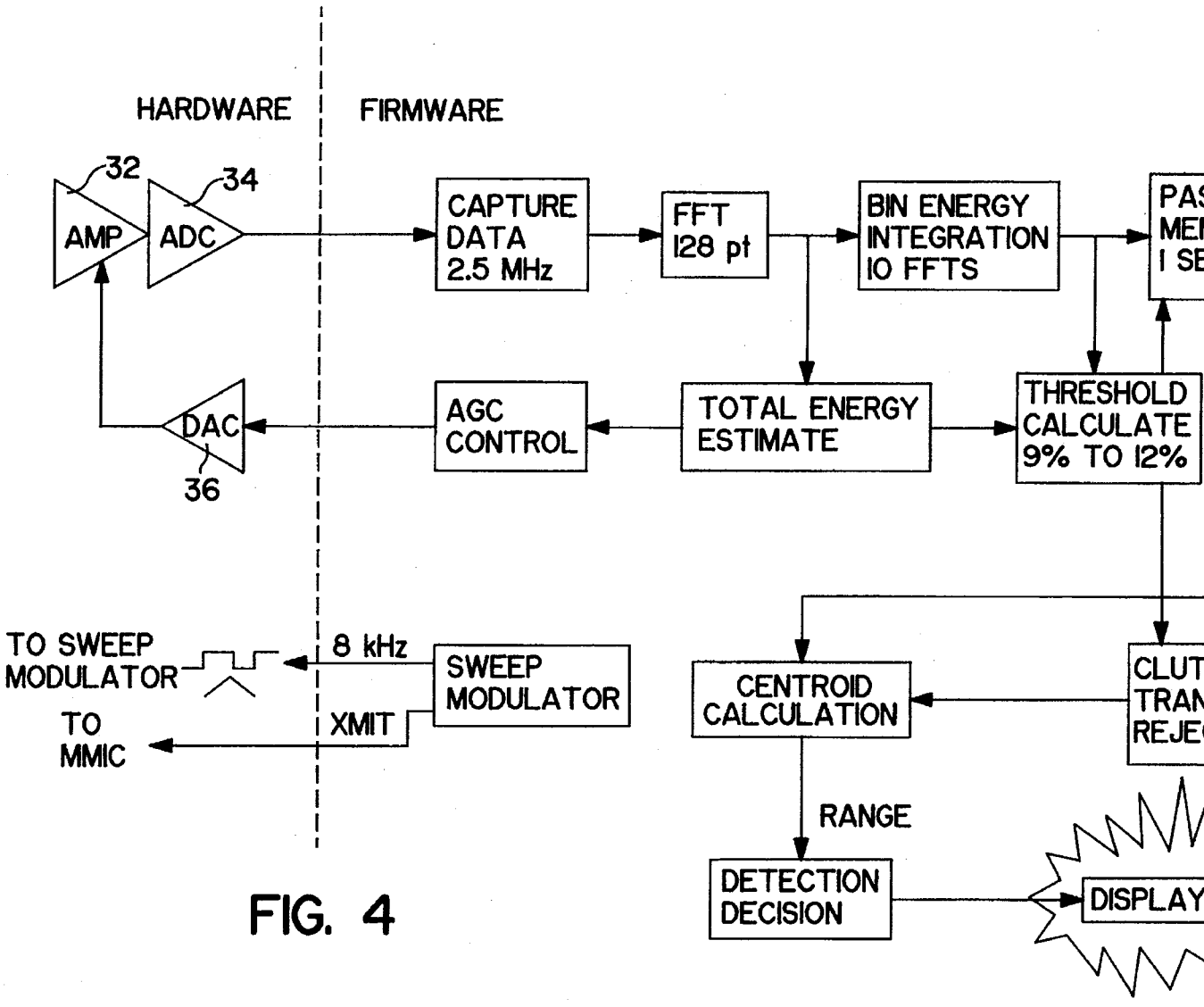

FIG. 4

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