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(54) Title: A FILTERING METHOD FOR CARRIER PHASE MEASUREMENTS FROM OPEN-LOOP TRACKING

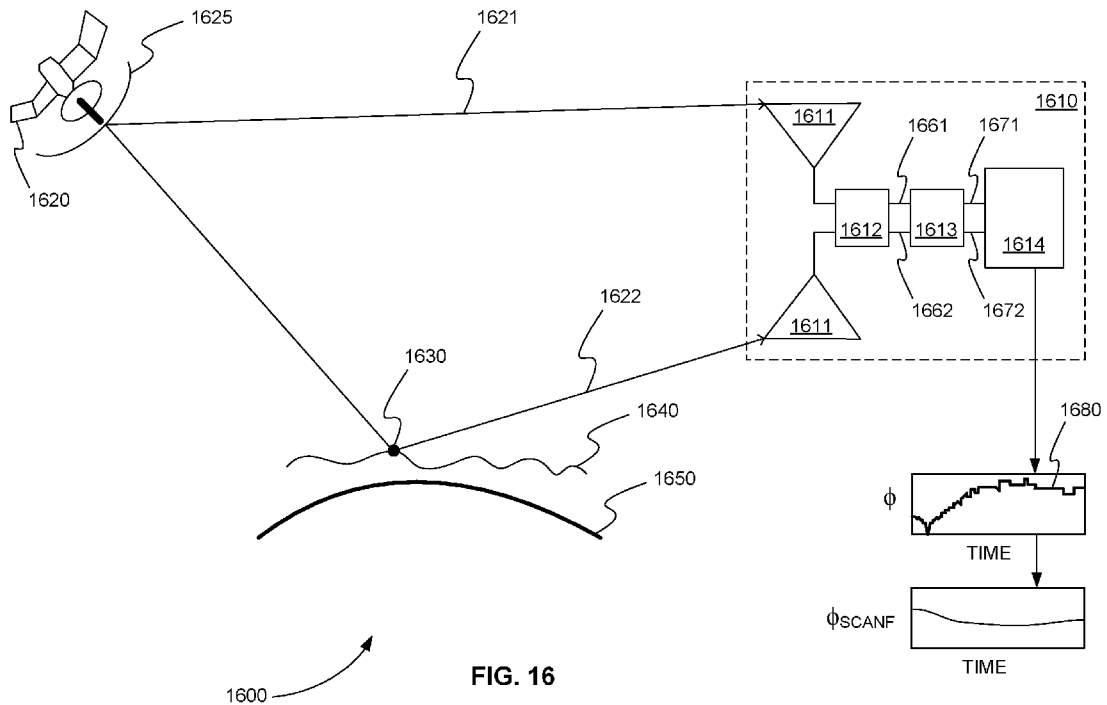


FIG. 16

(57) Abstract: DLOS and reflected signal components of an RF carrier signal are received. The reflected component is reflected from a point on the surface of the earth. The DLOS and reflected components are converted to digital DLOS IF and reflected IF signals, respectively. Modeled parameters are generated using the digital DLOS IF signal and locations of one or more antennas, the transmitter, and the point. A reference signal is generated based on the modeled parameters. The reference signal is correlated with the digital reflected IF signal to produce in-phase and quadrature-phase correlation results. A C/N0 and an estimated phase (EP) are calculated for the digital reflected IF signal from the correlation results. A KF is applied to the EP to produce an estimated filter phase (EFP). The KF is adapted to filter the EP using the estimated C/N0 to reduce cycle slips and noise in the EFP.



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## A. CLASSIFICATION OF SUBJECT MATTER

IPC - G01S 19/43; G01S 19/29; G01S 1/00 (2022.01)

CPC - G01S 19/43; G01S 1/00; G01S 5/02; G01S 19/09; G01S 19/04; G01S 19/21; G01S 19/29; G01S 19/32; G01S 19/35; G01S 19/37; G01S 19/41; G01S 19/44; G01S 19/51; G01S 19/53; G01S 19/55; H04B 7/185; H04B 7/155

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/0085738 A1 (WHITEHEAD, M ET AL.) 19 April 2007; figures 2-3, paragraphs [0043, 0046, 0054]	1-19
A	US 2013/0234885 A1 (GEIER, G ET AL.) 12 September 2013; figures 1-2, paragraphs [0033-0035, 0043]	1-19
A	US 2018/0074206 A1 (QUALCOMM INCORPORATED) 15 March 2018; figures 1, 7, paragraphs [0026, 0069]	1-19

 Further documents are listed in the continuation of Box C. See patent family annex.

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"&amp;" document member of the same patent family

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