

1994

The diagram illustrates a GPS system. At the top, four GPS satellites (labeled 12, 13, 14, and 15) are shown in orbit. A central box (labeled 20) represents a user, containing a 'GPS TRANSCEIVER' and a 'TRANSCEIVER' connected by a bidirectional arrow. Below the user box, a ground station (labeled 16) is shown, connected to the user's transceiver. The ground station is also connected to a network of antennas (labeled 17, 18, 19, and 20) via a central hub (labeled 21). Dashed lines represent the signal paths between the satellites, the user, and the ground station/antennas.

United States Patent

et al.
 OF AND APPARATUS FOR
 LOCATION AND TRACKING OF
 A VEHICLE OR THE LIKE BY THE
 RECEIPT OF PULSED
 SIGNALS AS OF THE
 TYPE AND THE LIKE, WITH AN
 S LOOP ANTENNA-RECEIVER

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 Anderson, Newport South,
 Incorporated



(17) Patent Number: 5,796,366
 (18) Date of Patent: Aug. 18, 1998

4,481,227 (12/1984) Patent
 Primary Examiner: Theodore M. Blum
 Attorney Agent, or Firm: Rizzo and Rizzo

ABSTRACT

This document deals with processing signals, particularly signals from a loop antenna.



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United States Patent Application Publication

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 (11) Pub. Date: Feb. 6, 2003

METHOD OF HIGH-POWER SWITCHING
 AND SWITCH APPARATUS FOR
 FREQUENCY MODULATION WITHIN
 LORAN-C SIGNALS

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Appl. No.: 09/922,283

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Publication Classification

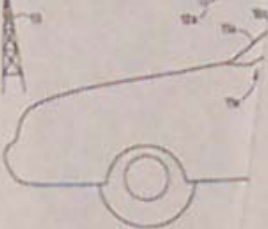
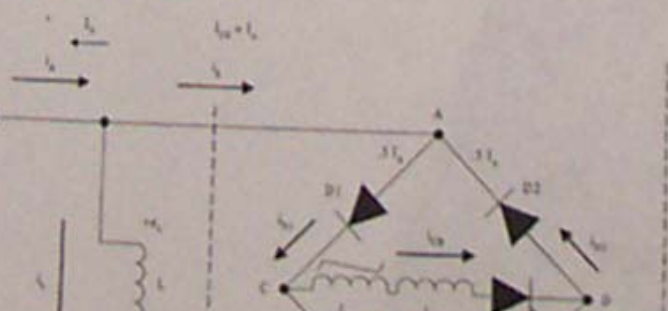
Int. Cl. H04B 1/00

(12) U.S. CL. 455/412, 455/112, 455/113

ABSTRACT

Frequency modulation switching apparatus for rapidly increasing and decreasing the frequency within radio-frequency pulses of radio wave pulse trains transmitted by an antenna having series inductance and capacitance, the apparatus having, in combination, a solid state four-terminal rectifier bridge circuit with opposing pairs of bridge terminals connected with one pair of opposing terminals shunting said inductance and said capacitance; and series-connected saturable and linear inductors and an SCR switch connected between the other pair of opposing terminals of the bridge circuit, whereby the high-speed triggering of the SCR on effects corresponding high-speed frequency increasing or decreasing of the frequency within the radio-frequency pulse to provide the desired frequency modulation therein.

$$I_A = I_A \cos \omega_A t$$



United States Patent

Engel (19) Date of Patent: Aug. 18, 1998

(34) METHOD OF AND APPARATUS FOR
 MESSAGE COMMUNICATION ON
 LORAN-C NAVIGATIONAL SIGNAL
 BROADCASTS AND THE LIKE WITH
 REDUCED NAVIGATION ERRORS

(72) Inventor: Per Engel, Gorton, Mass.

(73) Assignee: Megapulse, Inc., Bedford, Mass.

(21) Appl. No.: 116,461

(22) Filed: Nov. 3, 1987

(31) Int. Cl. G01S 1/24; H01K 7/04

(32) U.S. CL. 342/389; 342/390

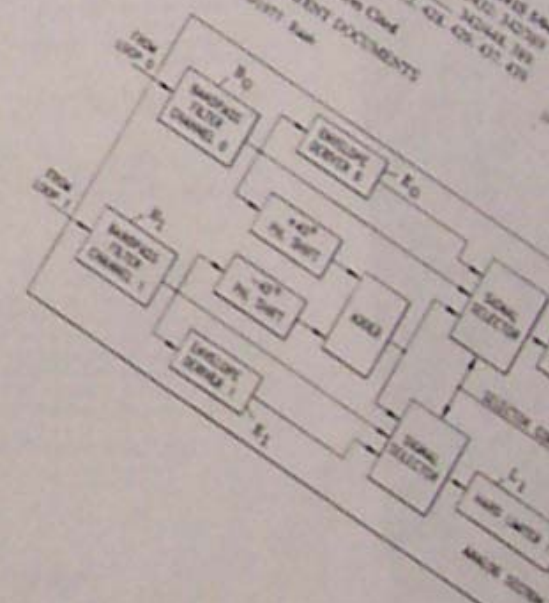
(38) Field of Search 342/387, 388, 389, 390; 342/391, 364/432, 375, 376

References Cited

- U.S. PATENT DOCUMENTS
- 3,711,722 1/1972 Johannessen
 - 3,736,790 5/1973 Lipsey et al.
 - 3,774,210 10/1973 Mullard et al.
 - 3,889,263 6/1975 Johannessen
 - 3,911,078 11/1975 Cuern
 - 4,001,590 1/1977 Johannessen
 - 4,151,528 4/1979 Johannessen
 - 4,262,138 7/1983 Jaeger et al.
 - 4,423,419 12/1983 Johannessen
 - 4,462,896 11/1984 Morick

OTHER

Radio Navigation 2
 Acron, MA, 1975
 Walter N. Dean,
 "navis: Compass
 Fort Wayne, I
 ITT Avionic
 Study, Phil
 D. A. Fe
 Loran-C
 rate of
 27%
 "Pr
 M"



(iii) 3,882,504

[45] May 6, 1975

PROCESS OF AND APPARATUS FOR
PROVIDING FILTER DISCRIMINATION
BETWEEN RECEIVED DIRECT IMPULSES
AND DELAYED PULSES AS IN PULSE
NAVIGATION AND RELATED
APPLICATIONS

Inventors: John M. Currie, Westford; Herbert L. Brown, Cohasset, both of Mass.

Assignee: International Navigation Corporation, Bedford, Mass.

1 Filed: Nov. 2, 1973

Appl. No.: 412,249

U.S. CL 343/103; 325/323; 333/70 A
CAI: 1/74

U.S. CL. G01: 1/24
Int. Cl. 343/101; 325/323

Int. CL. 343/103; 325/323;
Field of Search..... 333/70 A

References Cited

UNITED STATES PATENTS

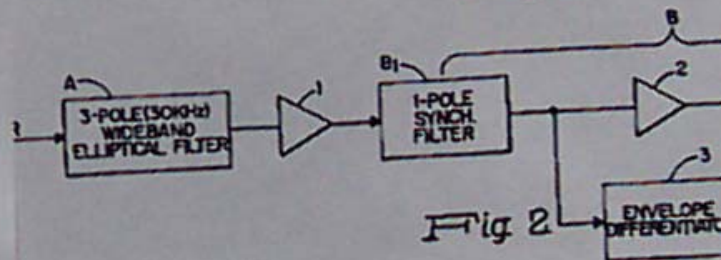
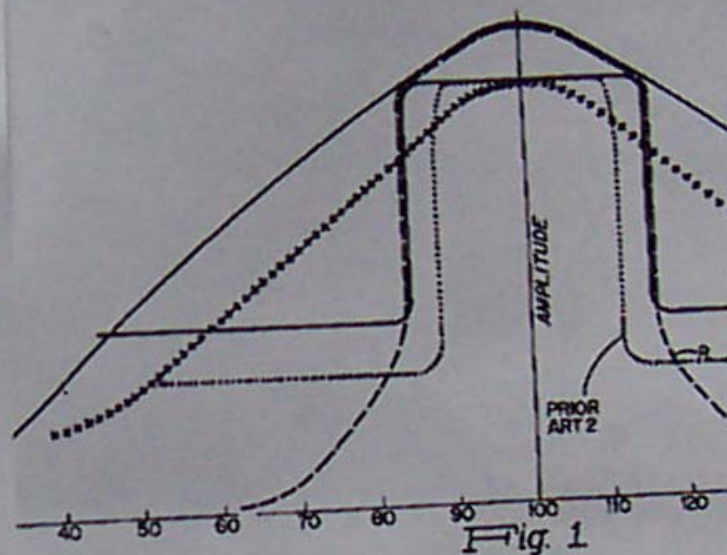
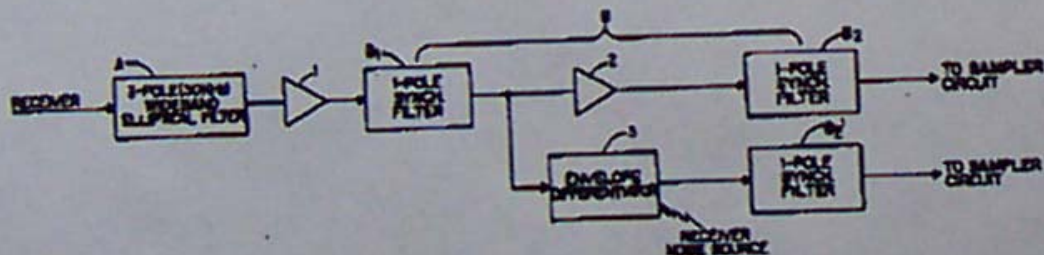
UNITED STATES PATENTS			
3,388,330	6/1968	Kretzmer	325/323
3,403,345	9/1968	Frank et al.	333/70 A

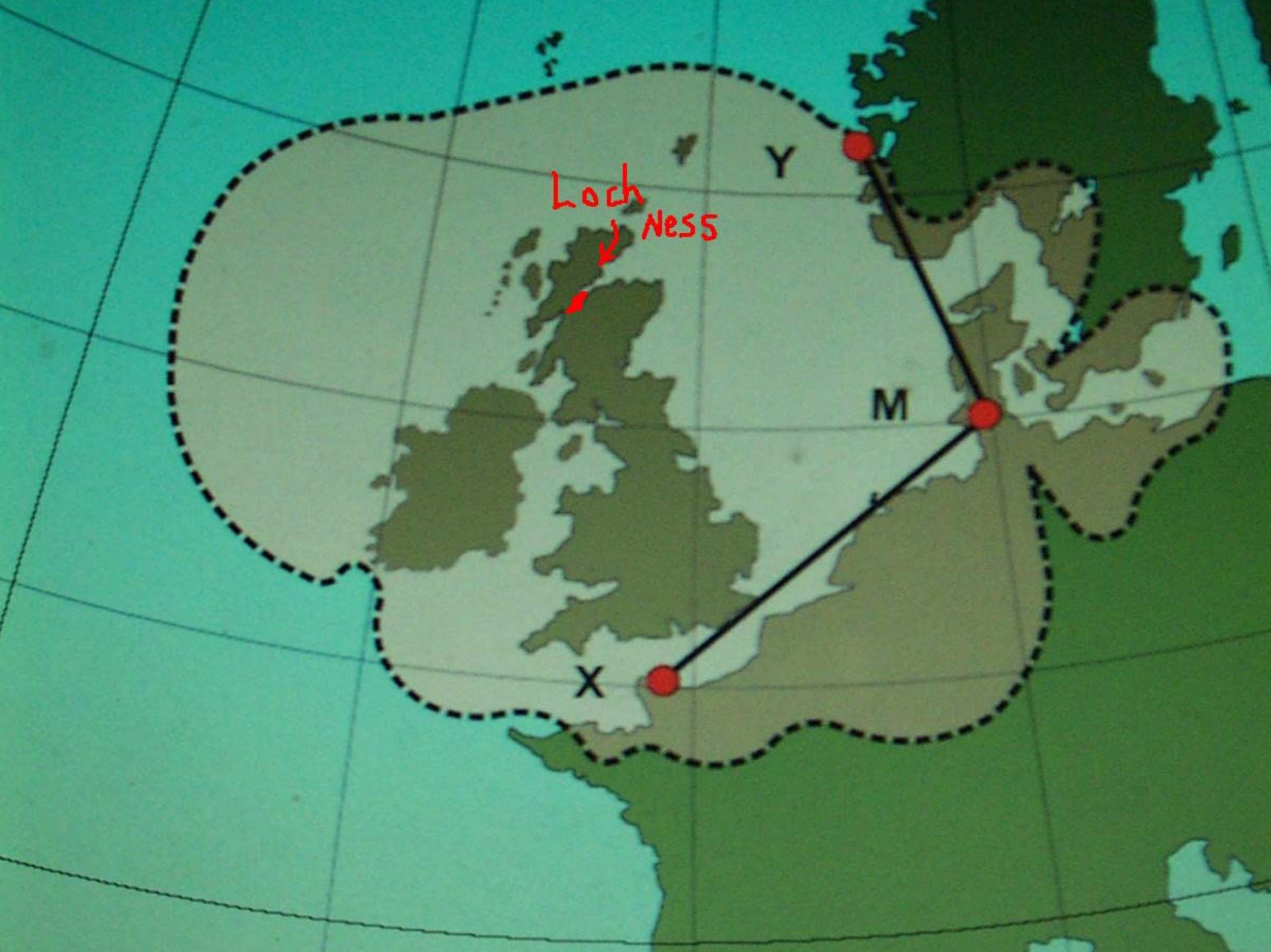
Primary Examiner—Malcolm F. Hubler
Assistant Examiner—Richard E. Berger
Attorney, Agent, or Firm—Rines and Rines; Shapiro
and Shapiro

ABSTRACT

[57] This disclosure deals with a novel combined filter using, preferably, a combination of limited pole elliptical and synchronous filters, for discriminating between direct and delayed radio-frequency impulses (as in Loran C or similar reception applications), while rejecting in-band and far-removed frequencies of proximal sources and the like.

13 Claims, 2 Drawing Figures









140 61²
Lomax River.

MOORING (Temple)
TO CASTLE



