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(54) **METHOD AND APPARATUS FOR REAL TIME CLOCK (RTC) BROWNOUT DETECTION**

(75) Inventor: **Steven A. Gronemeyer**, Cedar Rapids, IA (US)

(73) Assignee: **SIRF Technology, Inc.**, San Jose, CA (US)

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G01S 5/02 (2006.01)

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See application file for complete search history.

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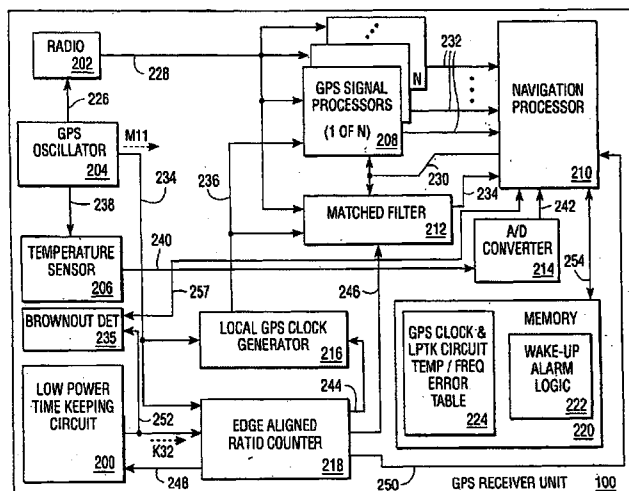|				
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(57) **ABSTRACT**

A method and apparatus for real time clock brownout detection. A low power real time clock (RTC) operates continuously to keep time in a global positioning system (GPS) receiver while some receiver components are powered down. In various embodiments, a brownout detector circuit detects a loss of RTC clock cycles. If a loss of RTC clock cycles exceeds a predetermined threshold such that the RTC is not reliable for GPS navigation, an RTC status signal so indicates.
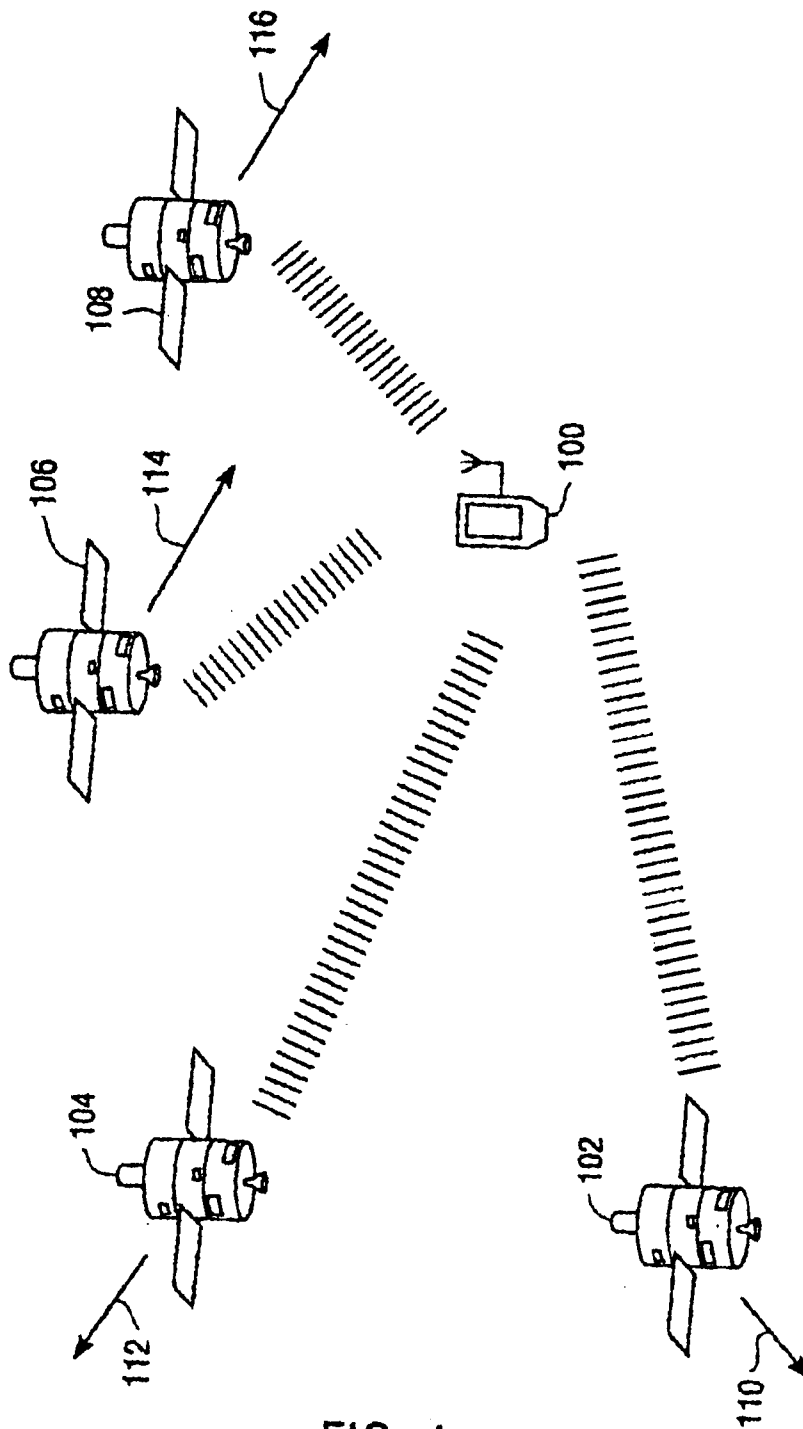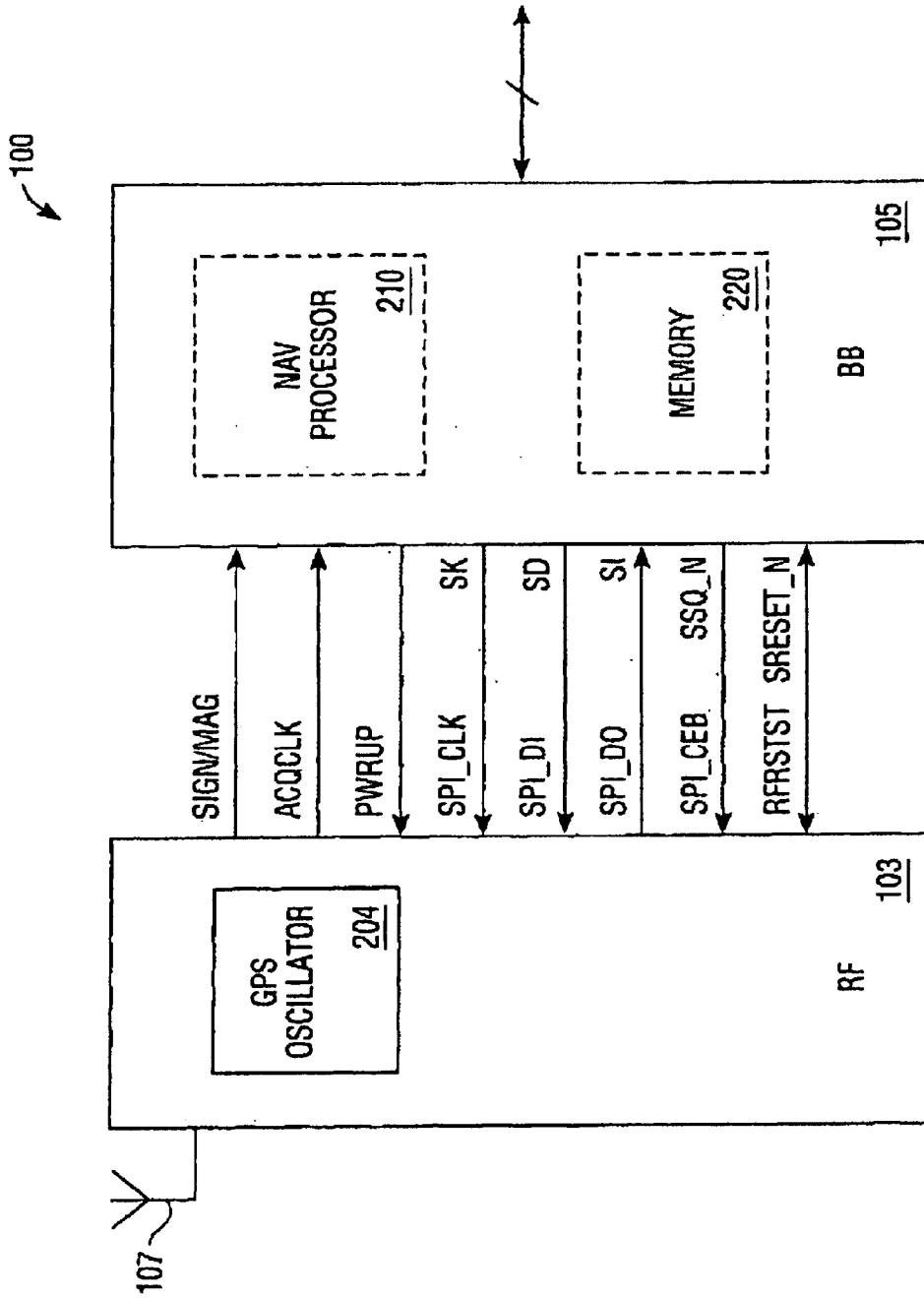
28 Claims, 9 Drawing Sheets

FIG. 1

FIG. 2

FIG. 3

FIG. 4

100

EDGE ALIGNED RATIO COUNTER 218

NAVIGATION PROCESSOR 210

WAKE-UP ALARM LOGIC 222

MEMORY 220

254

GPS CLOCK & LPTK CIRCUIT TEMP / FREQ ERROR TABLE 224

A/D CONVERTER 214

242

250

314

234

252

248

316

BROWNOUT DETECT 235

GPS OSCILLATOR 204

LOW POWER TIME KEEPING CIRCUIT

SIGNAL LATCH 304

LOW POWER CLOCK 306

200

312

K32 OSCILLATOR 302

310

318

TEMPERATURE SENSOR 308

320

330

332

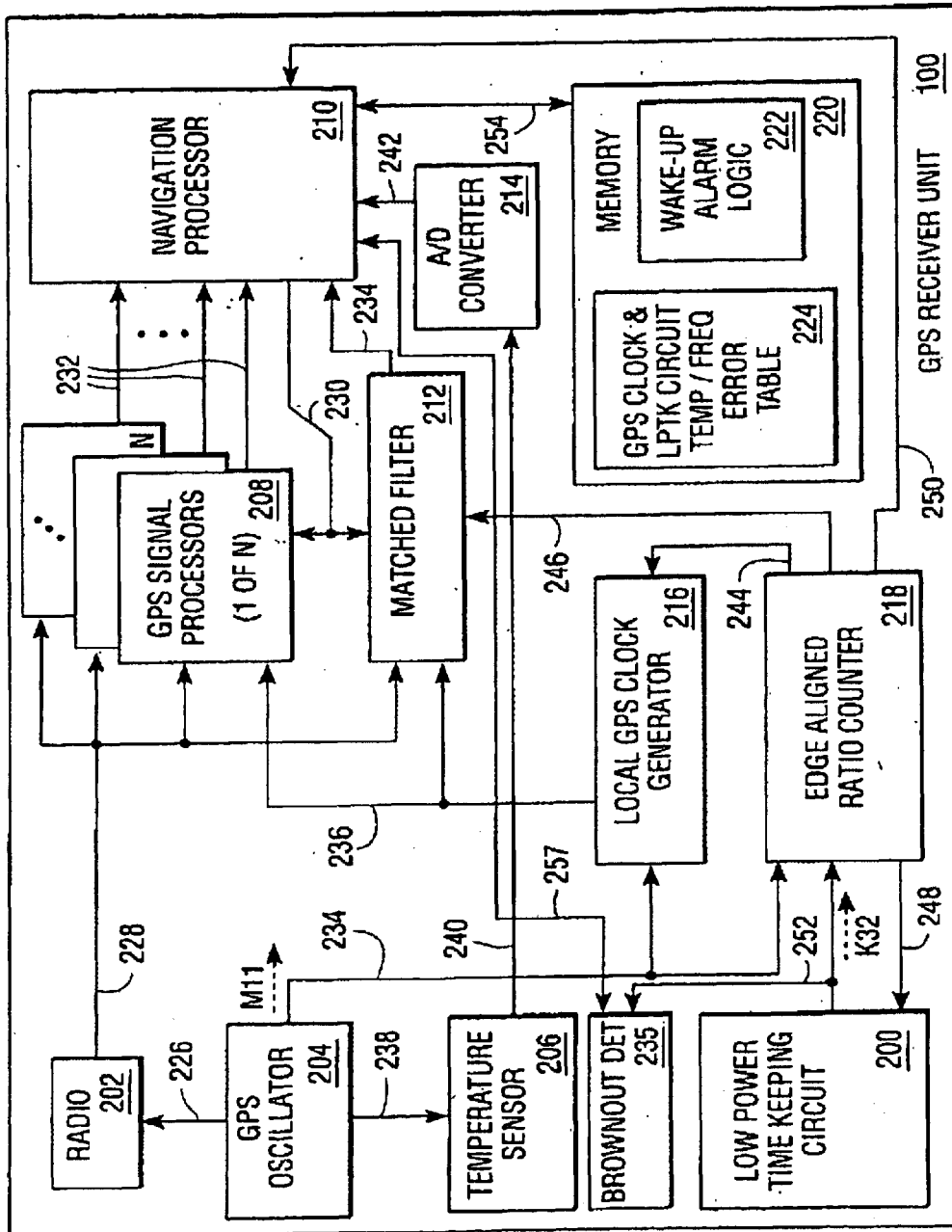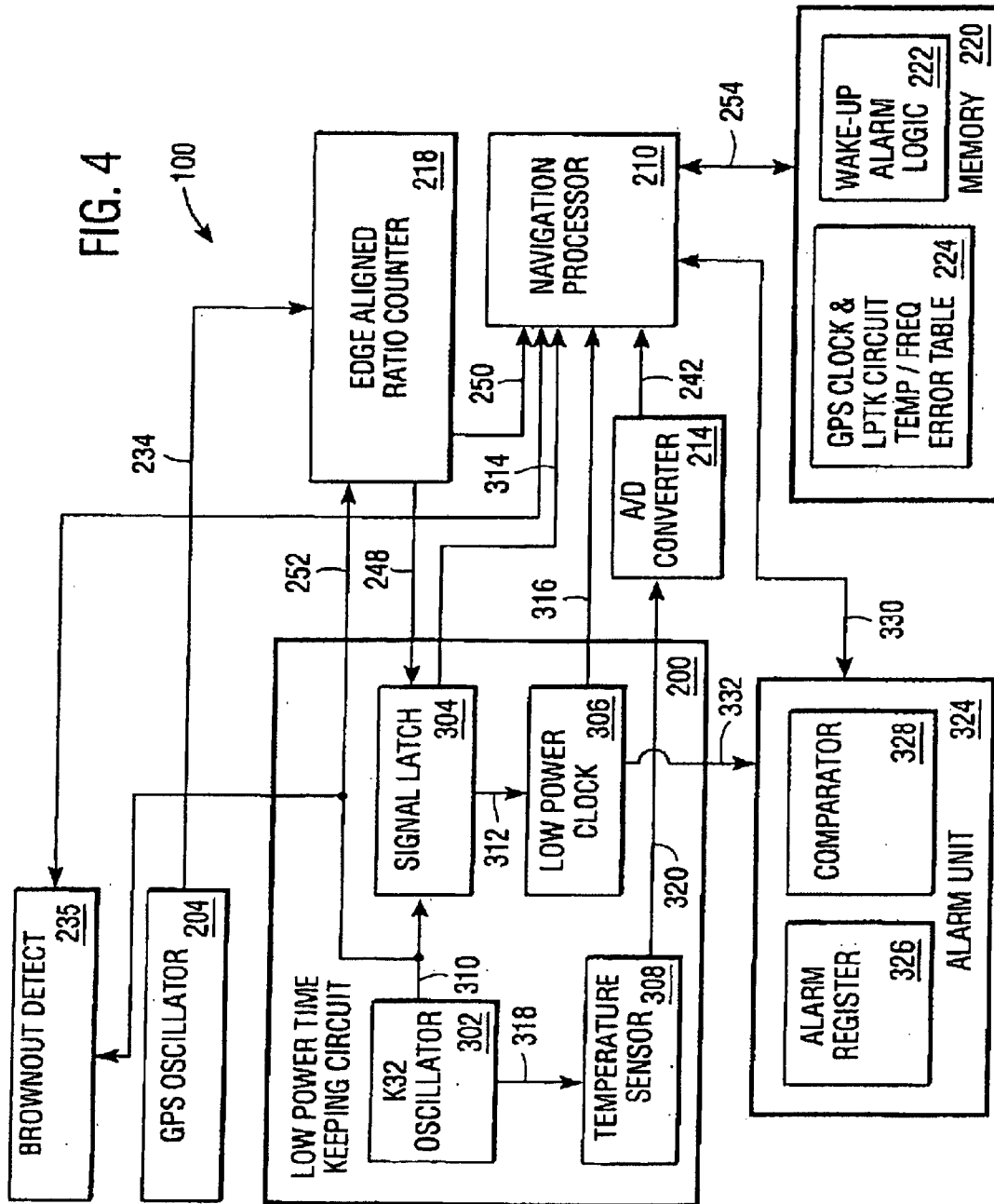ALARM REGISTER 326

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