

CLAIMS

What is claimed is:

1. A method of determining a location of a mobile device, comprising:
transitioning a wide area network (WAN) wireless modem, on the mobile device, to a low power state;
in response to expiration of a first timer and expiration of a second timer, transitioning the WAN wireless modem out of the low power state;
checking for a WAN page;
determining the location of the mobile device;
storing the location of the mobile device in memory; and
returning the WAN wireless modem to the low power state.
2. The method of Claim 1, wherein the first timer is a paging slot timer.
3. The method of Claim 1, wherein the second timer is a location determination timer.
4. The method of Claim 1, wherein a period of the first timer is shorter than a period of the second timer.
5. The method of Claim 1, further comprising: receiving, at the mobile device, a base station almanac.
6. The method of Claim 1, further comprising: receiving, at the mobile device, GNSS assistance.
7. The method of Claim 6, wherein the GNSS assistance comprises GNSS assistance effective for at least one day.
8. The method of Claim 1, wherein determining the location of the mobile device comprises acquiring a WAN frequency reference; estimating GNSS time; and determining GNSS pseudoranges.

9. The method of Claim 1, wherein determining the location of the mobile device comprises determining an uncertainty associated with the stored location; comparing the determined uncertainty with a predetermined uncertainty threshold; and, responsive to the determined uncertainty exceeding the predetermined uncertainty threshold, determining an updated location of the mobile device.

10. The method of Claim 1, further comprising:
transitioning the WAN wireless modem out of the low power state;
receiving a location request for the mobile device; and
providing the stored location of the mobile device.

11. The method of Claim 10, wherein receiving the location request comprises receiving a location request from an application on the mobile device.

12. The method of Claim 10, wherein receiving the location request comprises receiving a message from an application server requesting the location of the mobile device.

13. A mobile device for determining a location, comprising:
a memory;
a wide area network (WAN) wireless modem; and
one or more processing units coupled to the memory and the WAN wireless modem, the one or more processing units are configured to:
transition the WAN wireless modem to a low power state;
in response to expiration of a first timer and expiration of a second timer, transition the WAN wireless modem out of the low power state;
check for a WAN page;
determine the location of the mobile device;
store the location of the mobile device in the memory; and
return the WAN wireless modem to the low power state.

14. The mobile device of Claim 13, wherein: the first timer is a paging slot timer.

15. The mobile device of Claim 13, wherein: the second timer is a location determination timer.
16. The mobile device of Claim 13, wherein: a period of the first timer is shorter than a period of the second timer.
17. The mobile device of Claim 13, wherein the one or more processing units are further configured to: receive, at the mobile device, a base station almanac.
18. The mobile device of Claim 13, wherein the one or more processing units are further configured to: receive, at the mobile device, GNSS assistance.
19. The mobile device of Claim 18, wherein the GNSS assistance comprises GNSS assistance effective for at least one day.
20. The mobile device of Claim 13, wherein the one or more processing units configured to determine the location of the mobile device comprise one or more processing units configured to acquire a WAN frequency reference; estimate GNSS time; and determine GNSS pseudoranges.
21. The mobile device of Claim 13, wherein the one or more processing units configured to determine the location of the mobile device comprise: one or more processing units configured to determine an uncertainty associated with the stored location; compare the determined uncertainty with a predetermined uncertainty threshold; and, responsive to the determined uncertainty exceeding the predetermined uncertainty threshold, determine an updated location of the mobile device.
22. The mobile device of Claim 13, wherein the one or more processing units are further configured to:
transition the WAN wireless modem out of the low power state;
receive a location request for the mobile device; and
provide the stored location of the mobile device.

23. The mobile device of Claim 22, wherein the one or more processing units configured to receive the location request comprise: one or more processing units configured to receive a location request from an application on the mobile device.

24. The mobile device of Claim 22, wherein the one or more processing units configured to receive the location request comprise: one or more processing units configured to receive a message from an application server requesting the location of the mobile device.

25. A non-transitory computer-readable medium, having stored thereon computer-readable instructions to cause a processor to:
transition a wide area network (WAN) wireless modem, on a mobile device, to a low power state;
in response to expiration of a first timer and expiration of a second timer, transition the WAN wireless modem out of the low power state;
check for a WAN page;
determine a location of the mobile device;
store the location of the mobile device in memory; and
return the WAN wireless modem to the low power state.

26. The non-transitory computer-readable medium of Claim 25, wherein the wherein the first timer is a paging slot timer.

27. A mobile device for determining a location, comprising:
means for transitioning a wide area network (WAN) wireless modem, on the mobile device, to a low power state;
means for transitioning the WAN wireless modem out of the low power state in response to expiration of a first timer and expiration of a second timer;
means for checking for a WAN page;
means for determining the location of the mobile device;
means for storing the location of the mobile device in memory; and
means for returning the WAN wireless modem to the low power state.

28. The mobile device of Claim 27, wherein the wherein the first timer is a paging slot timer.

29. The mobile device of Claim 27, wherein the second timer is a location determination timer.

30. The mobile device of Claim 27, wherein a period of the first timer is shorter than a period of the second timer.