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McKenna et al.

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(54) **SYSTEM FOR INTEGRATING AN AIRBORNE WIRELESS CELLULAR NETWORK WITH TERRESTRIAL WIRELESS CELLULAR NETWORKS AND THE PUBLIC SWITCHED TELEPHONE NETWORK**

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(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. 09/686,923, filed on Oct. 11, 2000, which is a continuation-in-part of application No. 09/379,825, filed on Aug. 24, 1999, now Pat. No. 6,408,180, which is a continuation-in-part of application No. 08/960,183, filed on Oct. 29, 1997, now Pat. No. 6,108,539, which is a continuation-in-part of application No. 08/709,417, filed on Sep. 6, 1996, now Pat. No. 5,878,346, which is a continuation-in-part of application No. 08/027,333, filed on Mar. 8, 1993, now Pat. No. 5,444,762, and a continuation-in-part of application No. 07/847,920, filed on Mar. 6, 1992, now Pat. No. 5,557,656.

(51) **Int. Cl.**
H04Q 7/20 (2006.01)
H04B 10/00 (2006.01)

(52) **U.S. Cl.** **455/431**; 455/430; 455/456.3; 398/115

(58) **Field of Classification Search** 455/431, 455/11.1, 422.1, 456.3, 554.1, 430; 398/115
See application file for complete search history.

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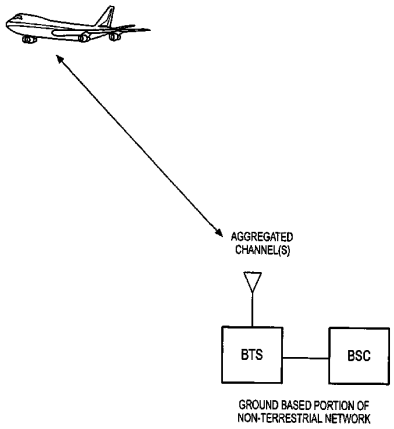
(57) **ABSTRACT**

The present non-terrestrial feature transparency system spoofs the Air-to-Ground Network and the ground-based cellular communication network into thinking that the wireless subscriber devices have no special considerations associated with their operation, even though the wireless subscriber devices are located on an aircraft in flight. This architecture requires that the non-terrestrial feature transparency system on board the aircraft replicate the full functionality of a given wireless subscriber device, that has a certain predetermined feature set from a ground-based wireless service provider, at another wireless subscriber device located within the aircraft. This mirroring of wireless subscriber device attributes enables a localized cell for in-cabin communication yet retains the same wireless subscriber device attributes for the air-to-ground link. The Air-to-Ground Network transmits both the subscriber data (comprising voice and/or other data) as well as feature set data between the Aircraft in-Cabin Network and the ground-based cellular communication network to thereby enable the wireless subscriber devices that are located in the aircraft to receive consistent wireless communication services in both the terrestrial (ground-based) and non-terrestrial regions.

51 Claims, 12 Drawing Sheets



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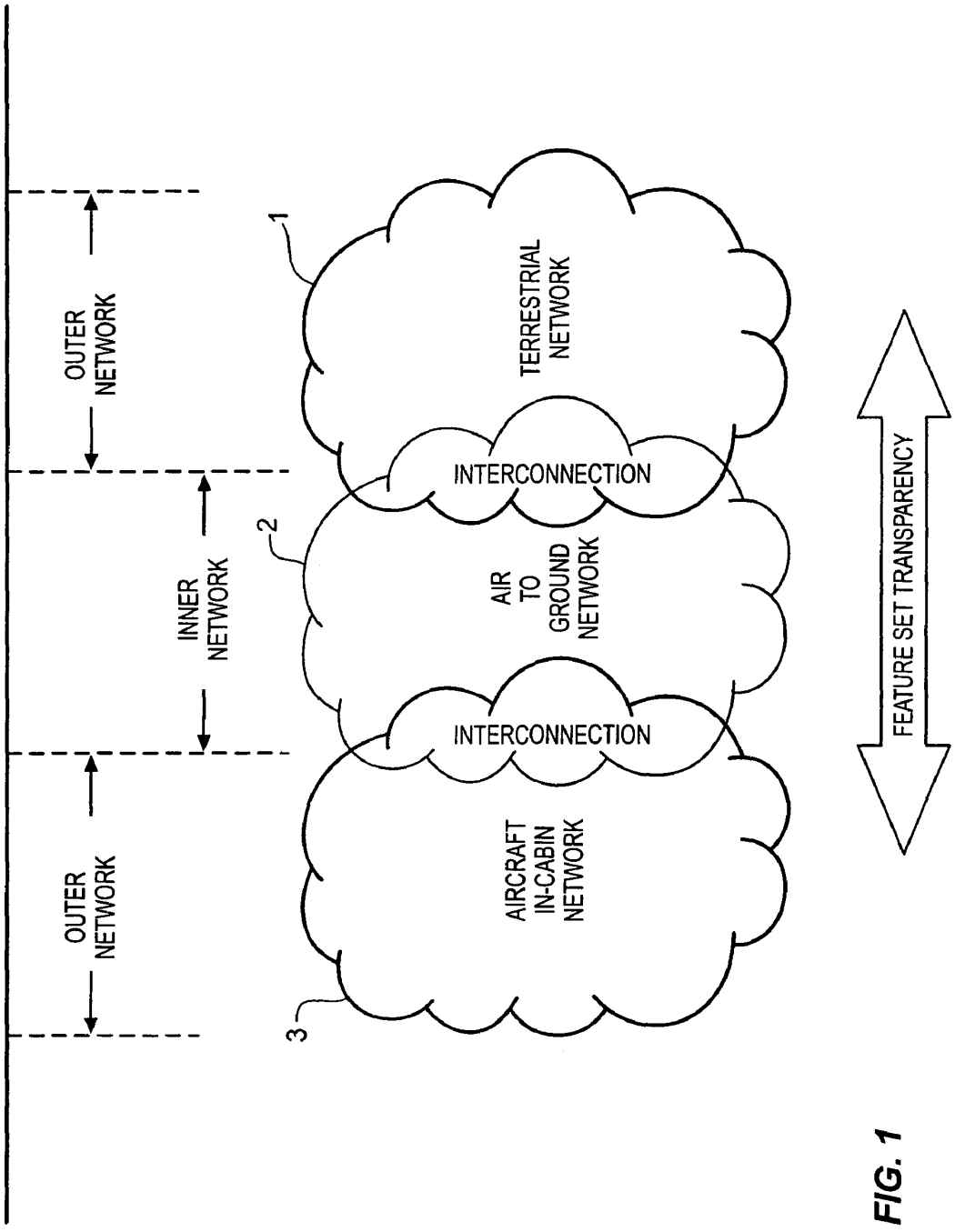

FIG. 1

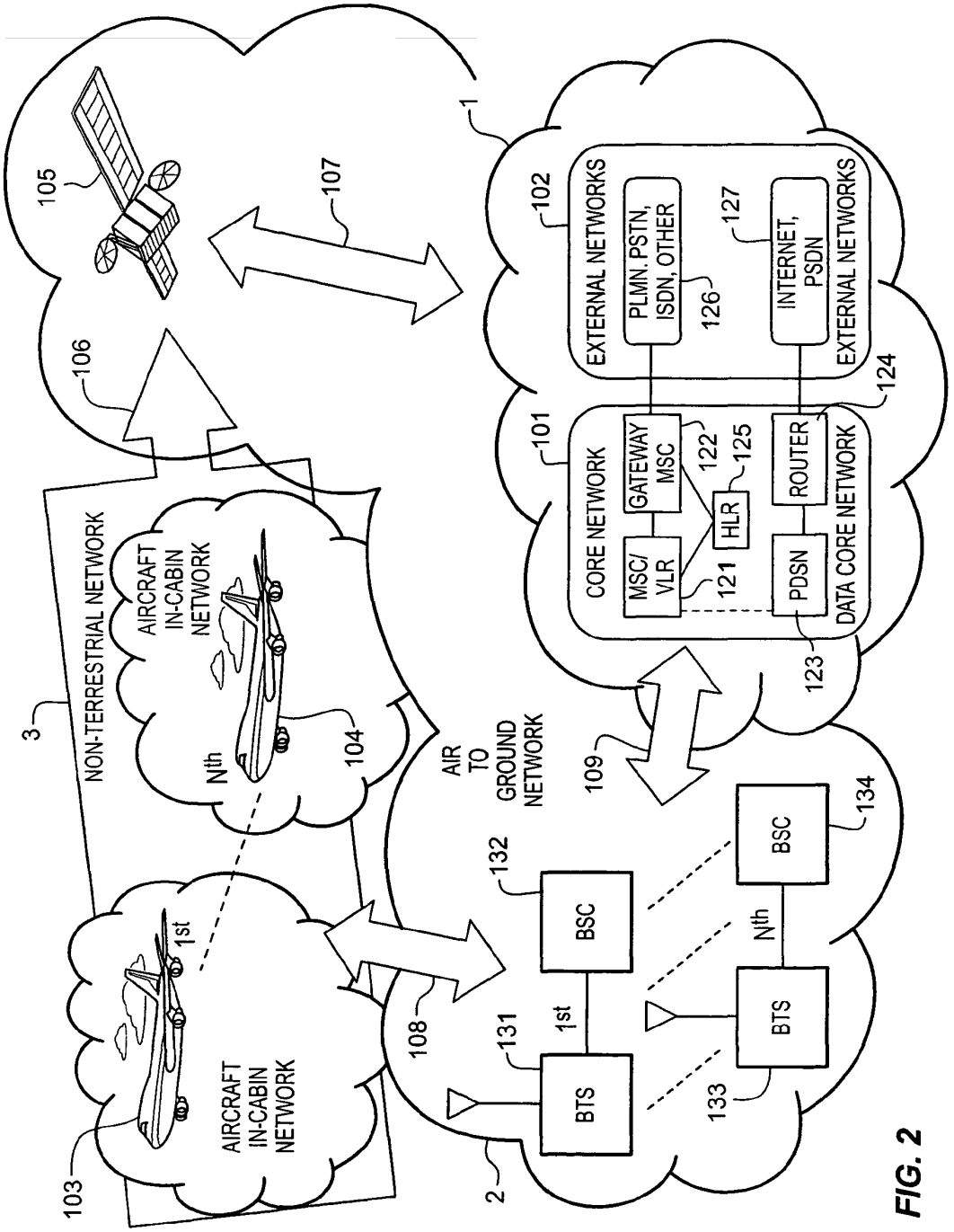

FIG. 2

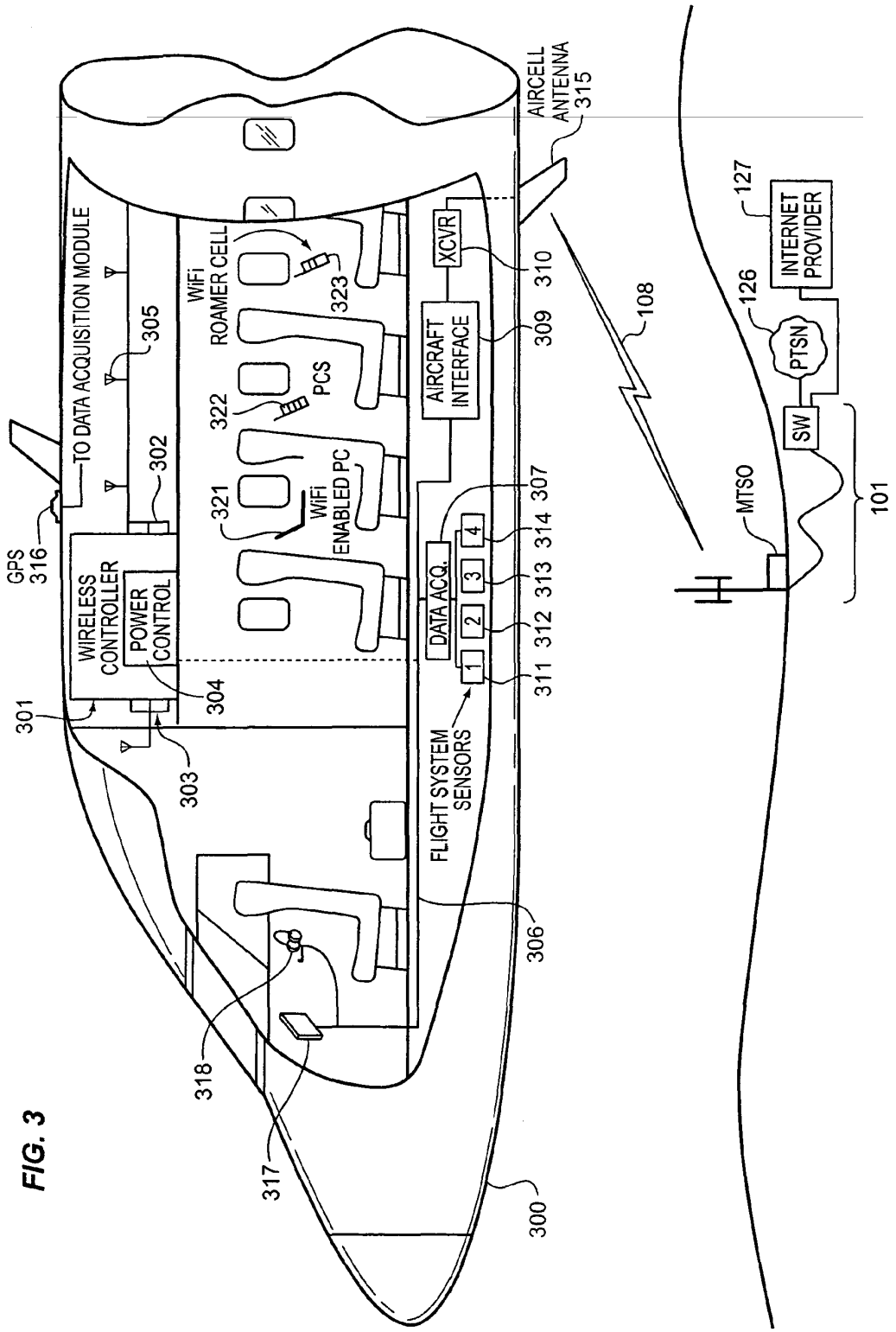

FIG. 3

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