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United States Patent [19]

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Goodings et al.

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[54] **RADIO DATA COMMUNICATION SYSTEM HAVING MEANS FOR REDUCING COLLISIONS BETWEEN CONTENTING REMOTE STATIONS**

WO89/06884 7/1989 WIPO .

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[75] Inventors: **Rupert Leslie A. Goodings; Leigh Carter; Patrick Mitchell**, all of Cambridge, Great Britain

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[73] Assignee: **Cognito Limited**, West Yorkshire, United Kingdom

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[21] Appl. No.: **867,680**

Primary Examiner—Wellington Chin

[22] PCT Filed: **Nov. 13, 1991**

Assistant Examiner—Chau T. Nguyen

[86] PCT No.: **PCT/GB91/01998**

Attorney, Agent, or Firm—Young & Thompson

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[57] ABSTRACT

[30] Foreign Application Priority Data

Nov. 13, 1990 [GB] United Kingdom 9024684

A radio based communication system comprises a base station (1) and one or more remote stations (2) each incorporating a radio transmitter and receiver to support communication between the base station and each remote station on a down link and between each remote station and the base station on an up link. Each link comprises a plurality of frames of fixed length divided into a fixed number of slots. The base station includes a base control which transmits control data in a general control slot (GC) in each frame of the down link so as to identify to each remote station a down-setup slot (DSU) in each frame of the down link in which the base station (1) is to announce the transmission of data for it and identify at least one down-transfer slot (DTR) in the frame of the down link in which the data is to be transmitted. The control data further identifies an acknowledgement slot (ACK) in each frame of the down link and an up-setup slot (USU) divided into sub-slots (1/4) in each frame of the up link. Each remote station (2) includes a remote control which transmits a request to transmit data to the base station (1) in any sub-slot (1/4) of the up-setup slot (USU) and receives corresponding data in the acknowledgement slot (ACK) of the down link to identify an up-transfer slot (UTR) in the up link in which it is to transmit data to the base station.

[51] Int. Cl.⁵ **H04J 3/16**

[52] U.S. Cl. **370/95.3; 370/110.1; 455/32.1**

[58] Field of Search 370/85.2, 85.7, 85.8, 370/85.1, 94.2, 110.1, 104.1, 95.1-95.2, 95.3, 94.1; 340/825.07, 825.08; 455/54.1, 38.3, 38.1, 34.2, 38.2, 34.1

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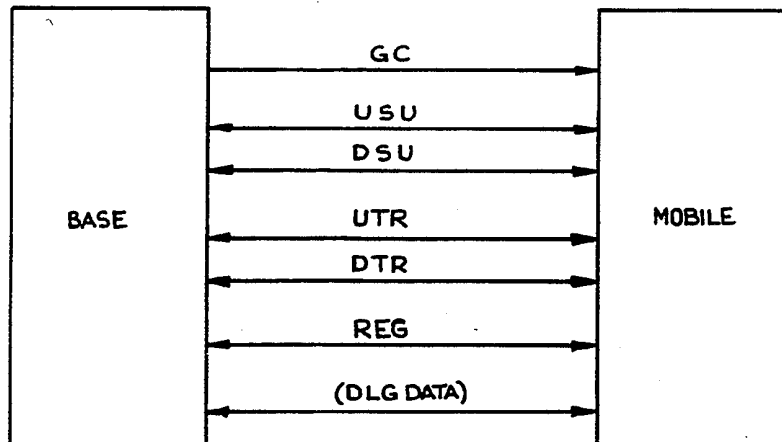
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14 Claims, 22 Drawing Sheets



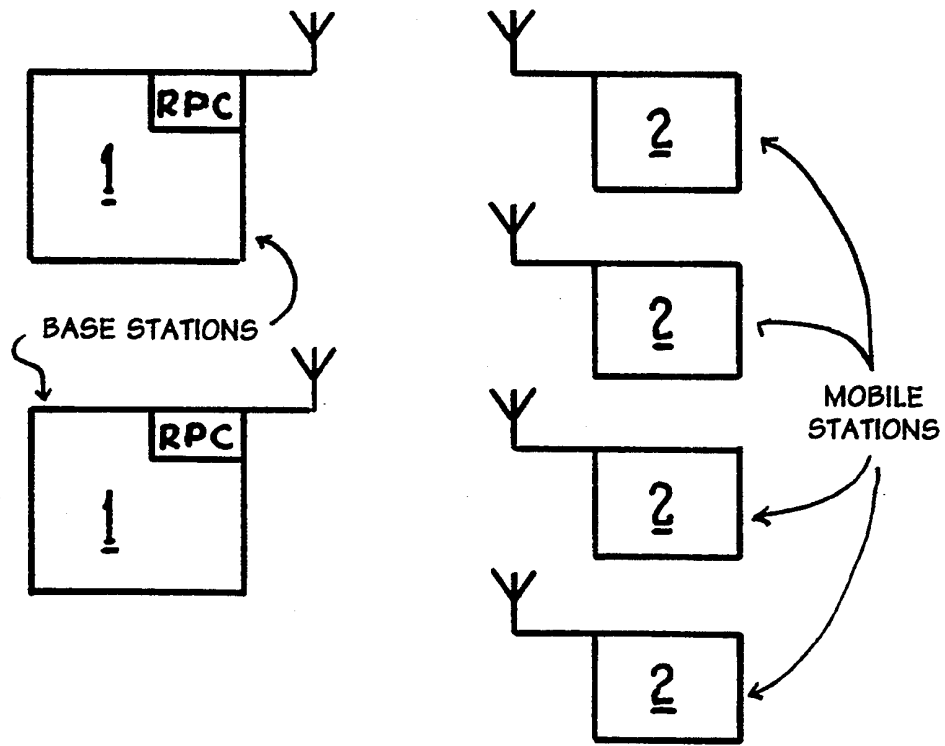


FIG. 1

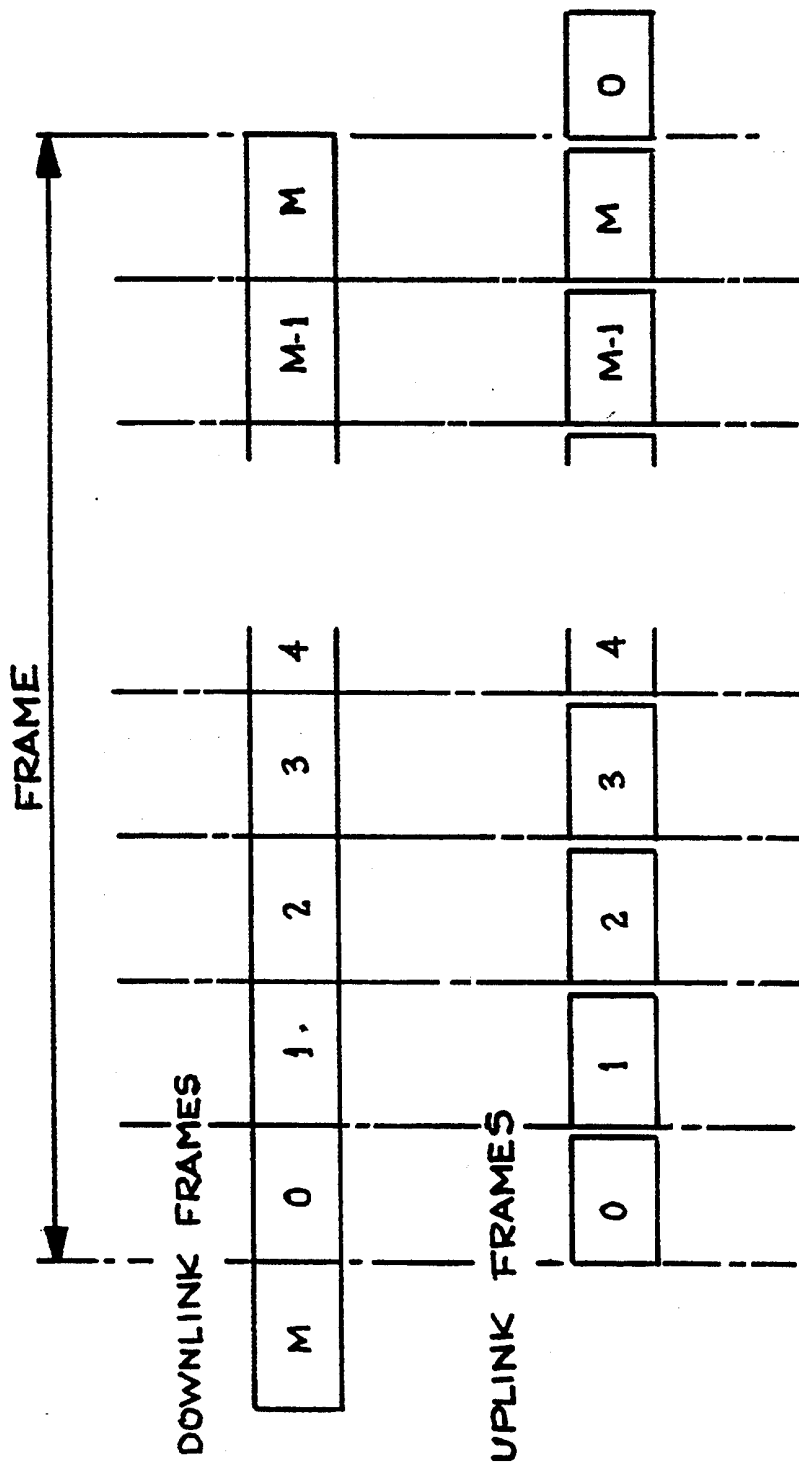


FIG. 2

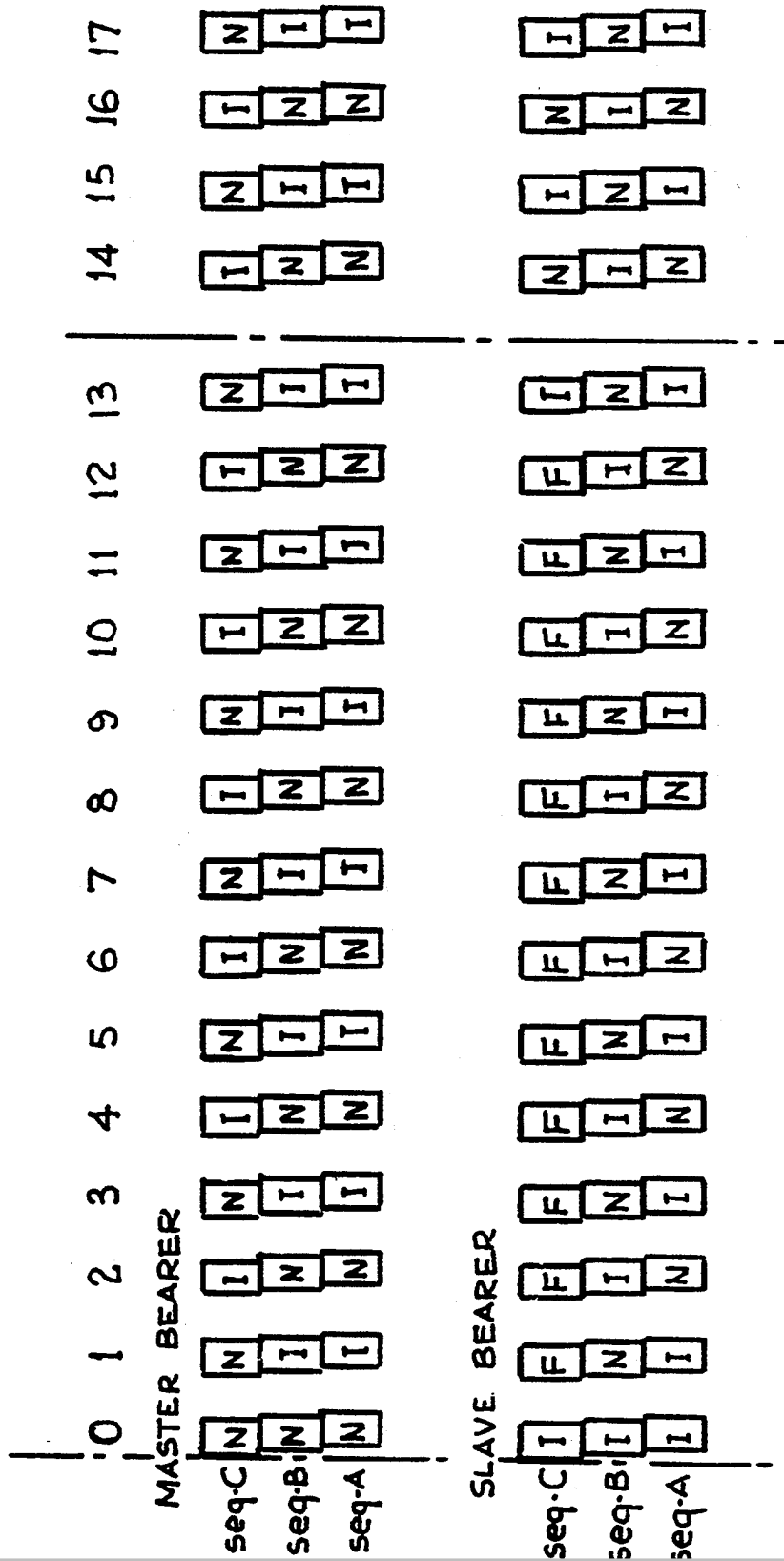


FIG. 3

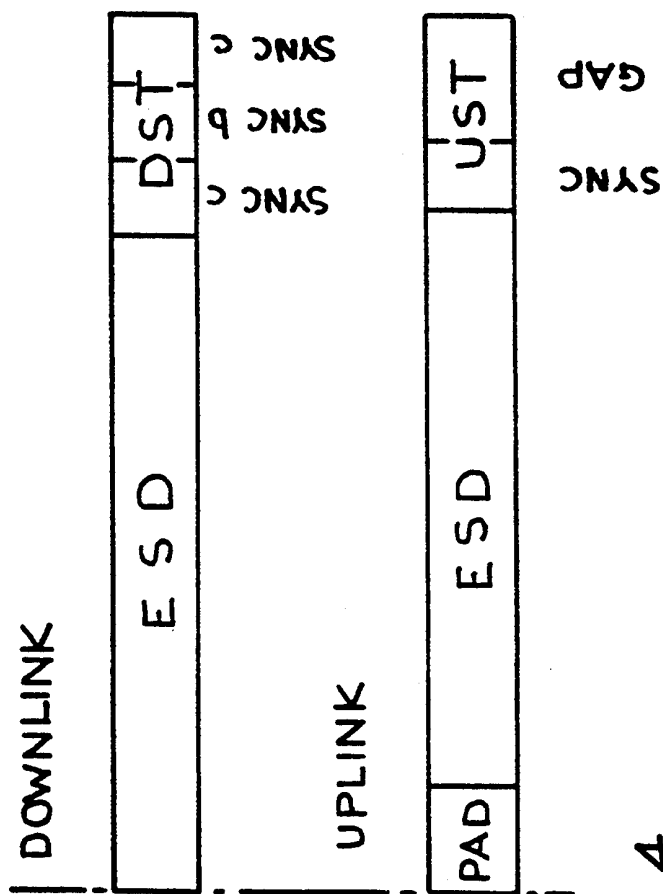


FIG. 4

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