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United States Patent [19] Kou

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[54] **MULTIPLE ACCESS SATELLITE COMMUNICATION SYSTEM FOR MINI-EARTH STATION NETWORKS**

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[73] Assignee: **NEC Corporation, Japan**
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[22] Filed: **Jun. 25, 1990**

for Mini-Earth Station Networks”, vol. 3 of 3, pp. 1494-1499 (1986).

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 542,205, Jun. 22, 1990, abandoned.

Foreign Application Priority Data

Jun. 22, 1989 [JP] Japan 1-158186

[51] Int. Cl.⁵ **H04J 3/16**
[52] U.S. Cl. **370/95.3; 370/104.1**
[58] Field of Search **370/95.3, 94.1, 104.1, 370/95.1, 94.2**

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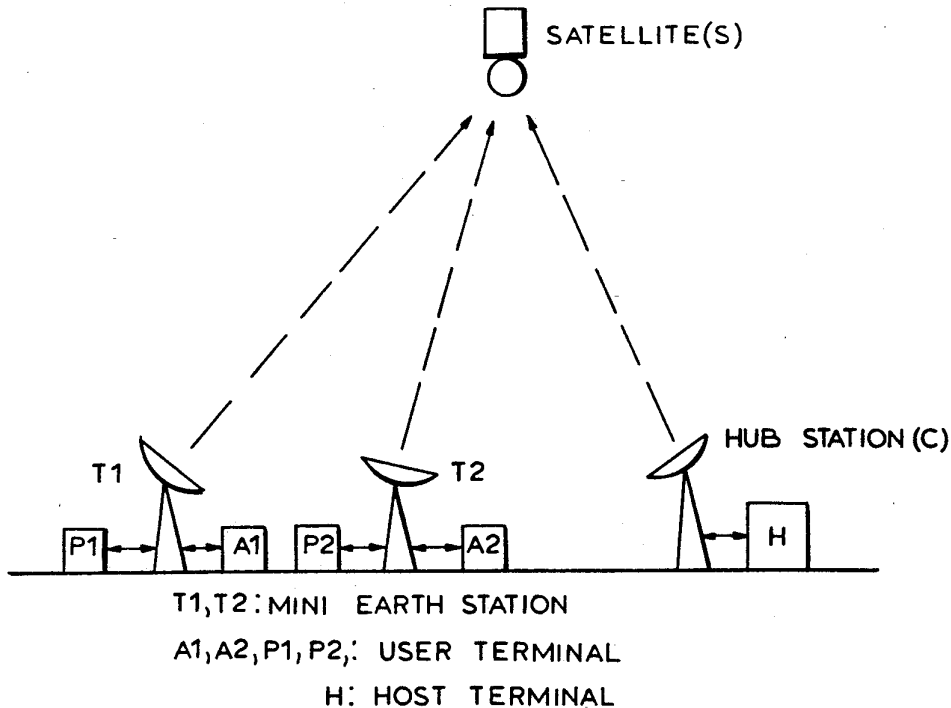
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[57] ABSTRACT

A multiple access satellite communication system in which a plurality of mini-earth stations each transmit data packets to hub earth station via a satellite over an inbound channel, while the hub station transmits to the mini-earth stations in a broadcast mode over outbound channels. Each mini-earth station selectively uses a fixed assignment access method, random access method, and demand assignment access method, depending on the frequency of the transmission from a terminal connected thereto, the amount of transmitted data, and whether or not the transmission from the terminal is periodic. The hub station outputs a reception response signal to the outbound channels by determining whether or not a conflict of data packets or a transmission error has occurred on the inbound channels. Packets for re-transmission are sent out to the inbound channels by the demand assignment access method at all times, with no regard to the access method used at the time of transmission.

3 Claims, 18 Drawing Sheets



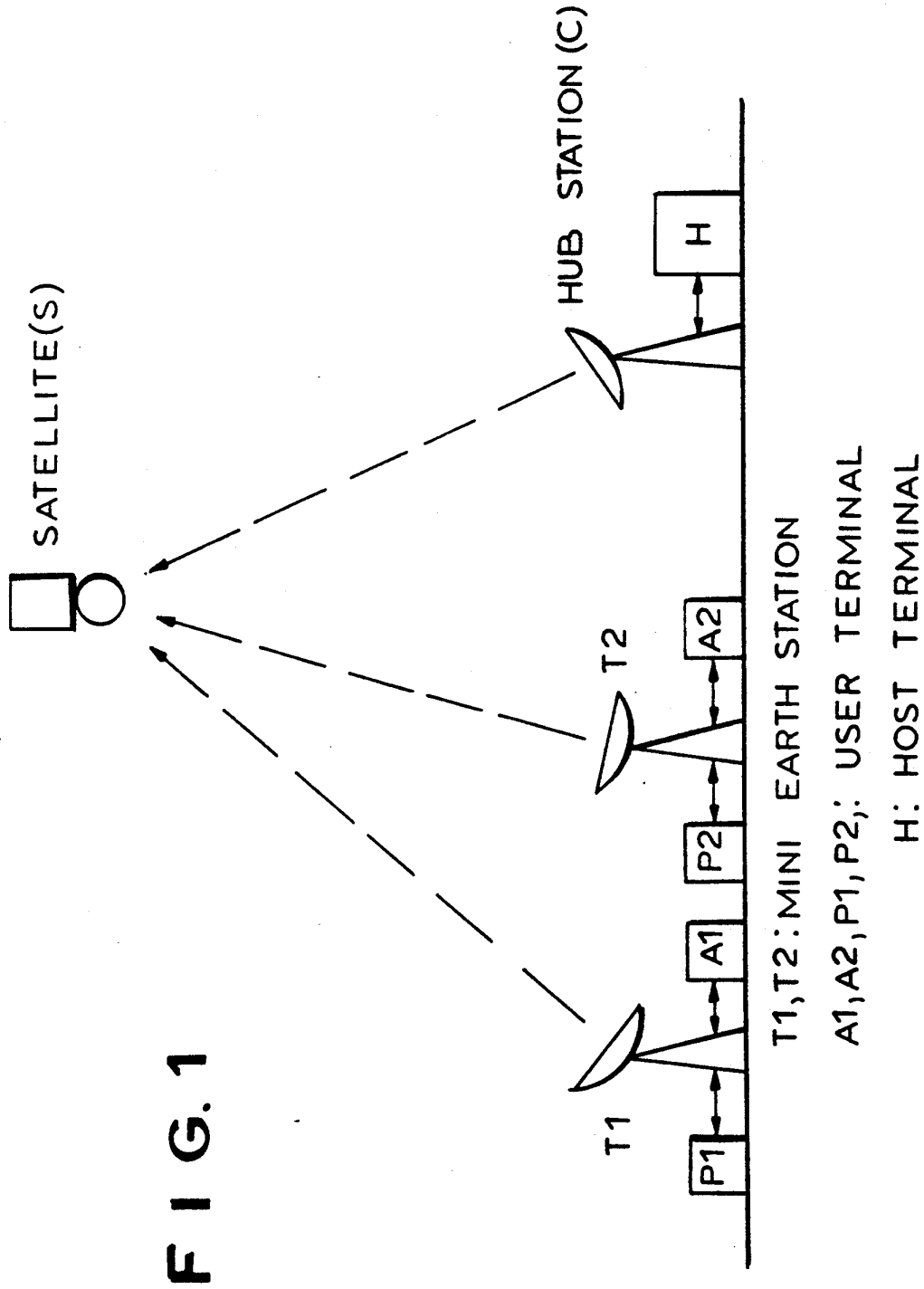
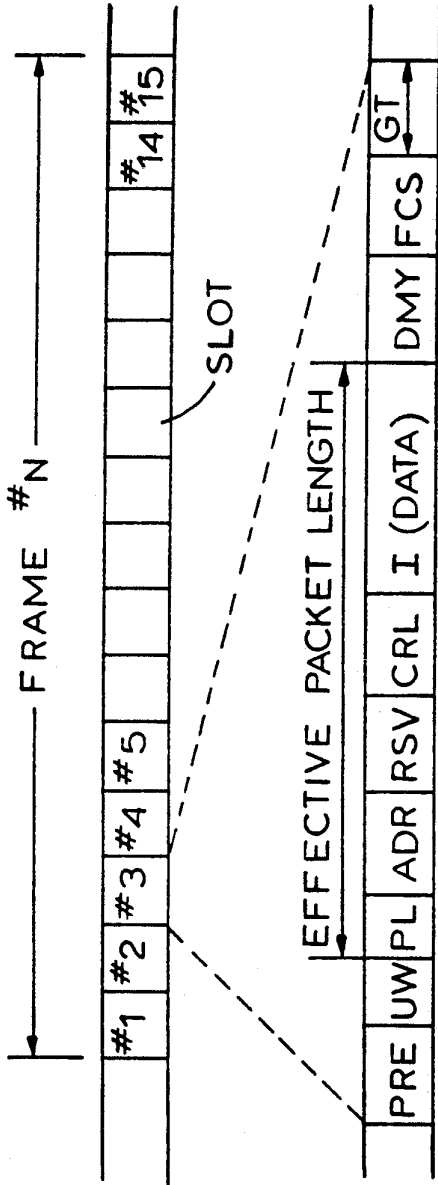


FIG. 1

FIG. 2



PRE: PREAMBLE
 UW: UNIQUE WORD
 PL: EFFECTIVE PACKET LENGTH
 ADR: MINI-EARTH STATION ADDRESS FIELD
 RSV: RESERVATION SLOT REQUEST FIELD
 CRL: CONTROL FIELD
 I: USER DATA SECTION
 DMY: DUMMY BITS
 FCS: FRAME CHECK SEQUENCE
 GT: GUARD TIME

FIG. 3

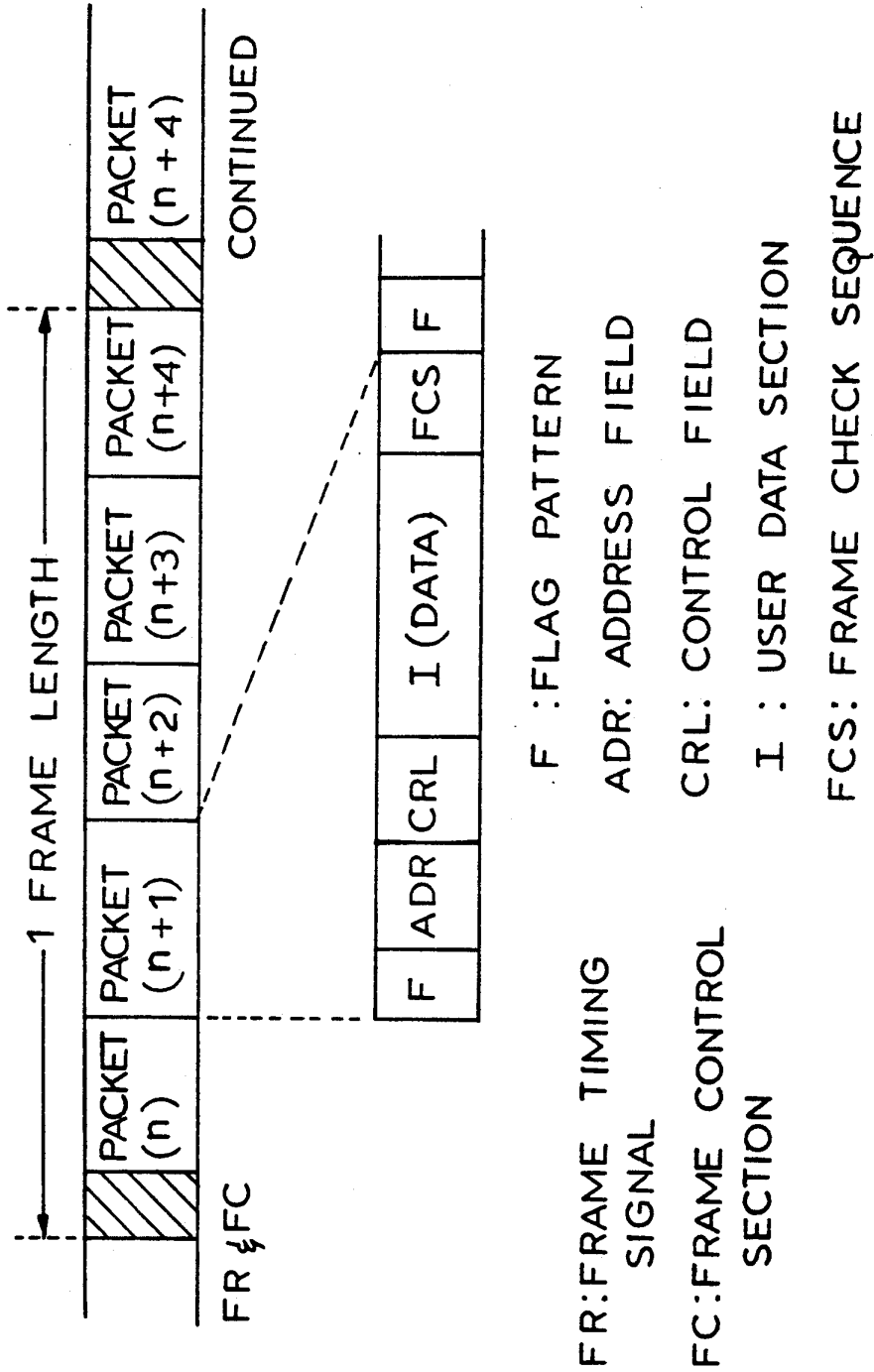
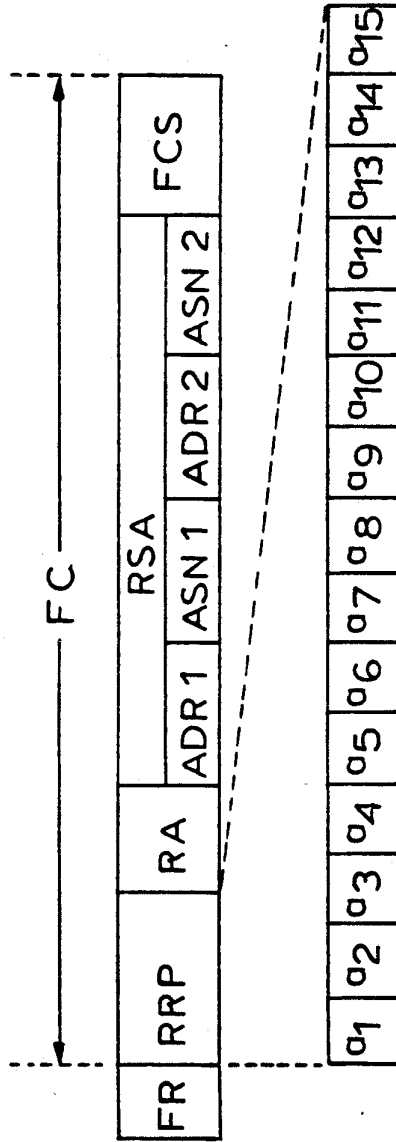


FIG. 4



RRP: RECEPTION RESPONSE FIELD

RA: RANDOM ACCESS SLOT ASSIGNMENT FIELD

RSA: RESERVED ACCESS SLOT ASSIGNMENT FIELD

FCS: FRAME CHECK SEQUENCE

01~015: ACK/NAK

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