

- [54] **METHOD AND APPARATUS FOR FRAME-BIT MODULATION AND DEMODULATION OF DS3 SIGNAL**
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- 4,430,731 2/1984 Gimple et al. 370/112
- 4,747,112 5/1988 Blondeau, Jr. et al. 375/20

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[57] **ABSTRACT**

A method of modulating a DS3 signal for addition thereto of an auxiliary, transparent signalling channel, the DS3 signal having framing bits which provide a predetermined pattern for which frame-finding circuits hunt to demultiplex the payload of the DS3 signal. The method comprises cyclically forcing an framing-bit error onto every D-spaced framing-bit of the DS3 signal during an initial ON period of an ON-OFF modulation cycle, the ON period and the modulation cycle having lengths such that no more than two verification attempts are required to complete reframing of the signal in the presence of the framing-bit modulation, and wherein the Modulation Spacing, D, is selected so as to provide a low probability of coincidence between the framing-bit Modulation Spacing and a verification window following a secondary reframing hunt.

[56] **References Cited**

U.S. PATENT DOCUMENTS

- 4,243,930 1/1981 DeCoursey 370/110.4
- 4,387,460 6/1983 Boutmy et al. 370/110.4
- 4,404,675 9/1983 Karchevski 371/457
- 4,408,325 10/1983 Grover 370/110.4

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