

- [54] **ENSEMBLE MODEM STRUCTURE FOR IMPERFECT TRANSMISSION MEDIA**
- [75] **Inventor:** Dirk Hughes-Hartogs, Morgan Hill, Calif.
- [73] **Assignee:** Telebit Corporation, Cupertino, Calif.
- [21] **Appl. No.:** 736,200
- [22] **Filed:** May 20, 1985
- [51] **Int. Cl.⁴** H04M 11/00; H04B 15/00; H04L 5/00
- [52] **U.S. Cl.** 379/98; 375/39; 375/58; 370/19; 455/63; 455/68
- [58] **Field of Search** 179/2 DP; 375/38, 40, 375/58, 39, 118; 370/16, 19; 455/63, 68; 340/825.15

4,559,520	12/1985	Johnston	370/19 X
4,573,133	2/1986	White	455/63 X
4,574,244	3/1986	Head	375/39
4,601,044	7/1986	Kromer, III et al.	375/118 X

OTHER PUBLICATIONS

Johnson, "PC Communications: The Revolution is Coming", Telecommunications, vol. 19, No. 10, issued Oct. 1985, pp. 58j-58r.
 Information Theory and Reliable Communication, pp. 383-431, John Wiley & Sons, New York, 1968.

Primary Examiner—Gene Z. Rubinson
Assistant Examiner—M. Connors
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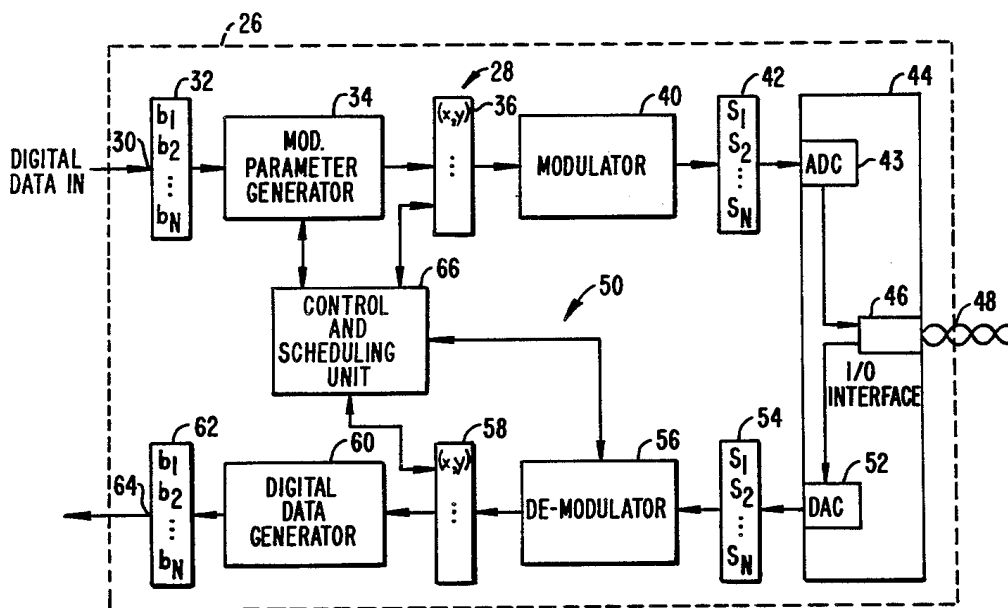
[57] **ABSTRACT**

A high-speed modem that transmits and receives digital data on an ensemble of carrier frequencies spanning the usable band of a dial-up telephone line. The modem includes a system for variably allocating data and power among the carriers to compensate for equivalent noise and to maximize the data rate. Additionally, systems for eliminating the need for an equalization network, for adaptively allocating control of a channel, and for tracking variations in line parameters are disclosed.

17 Claims, 13 Drawing Figures

[56] **References Cited**
U.S. PATENT DOCUMENTS

4,047,153	9/1977	Thirion	375/40 X
4,206,320	6/1980	Keasler et al.	375/38 X
4,315,319	2/1982	White	455/63 X
4,438,511	3/1984	Baran	370/19
4,459,701	7/1984	Lamiral et al.	375/118 X
4,494,238	1/1985	Groth, Jr.	375/40 X
4,495,619	1/1985	Acompora	375/58 X
4,555,790	11/1985	Betts et al.	375/39



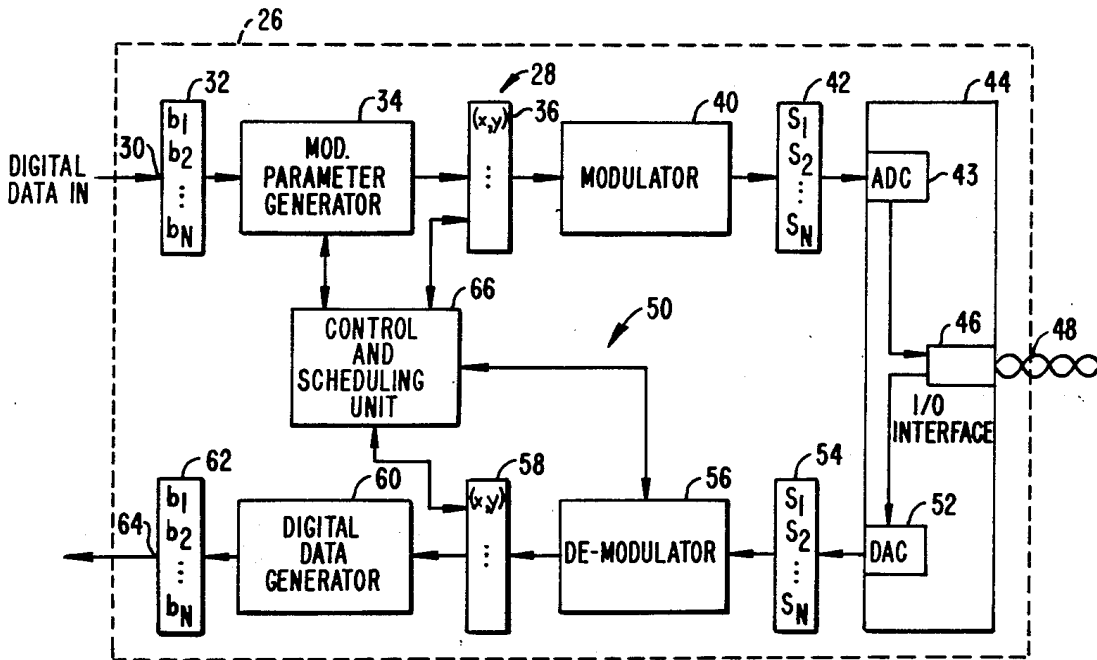
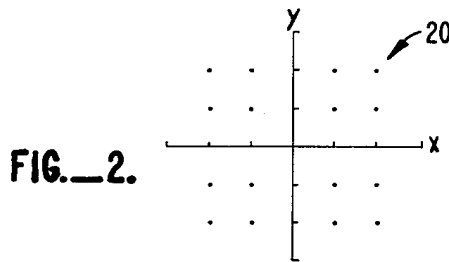
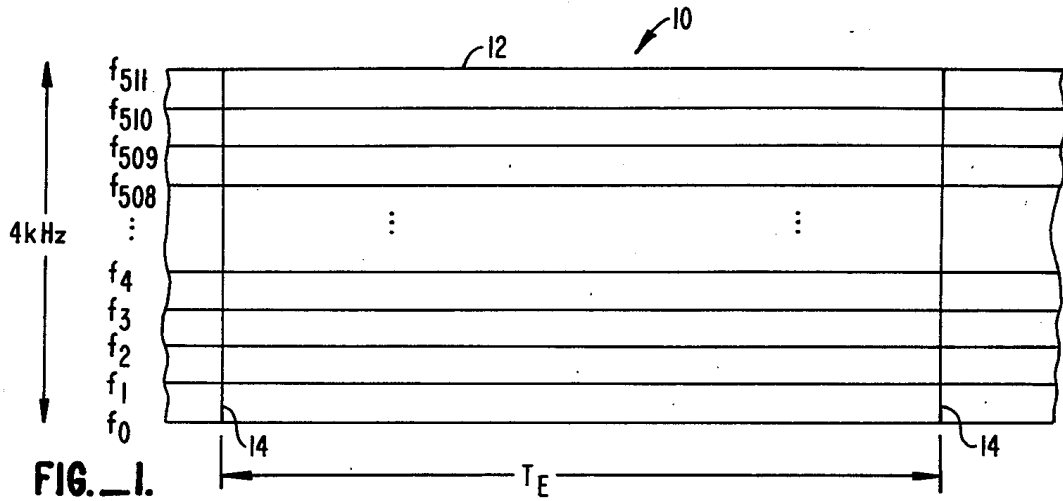


FIG. 3.

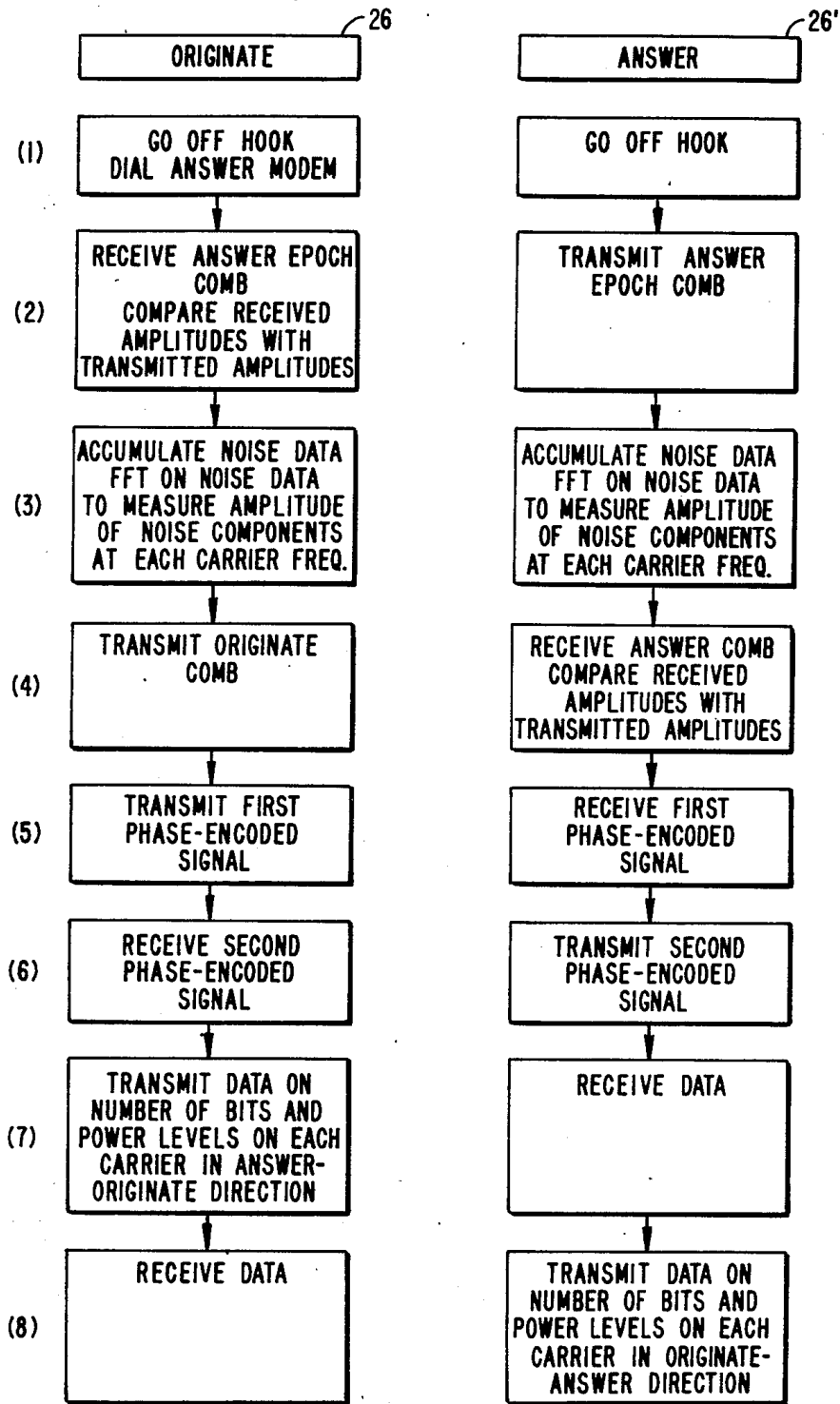


FIG. 4.

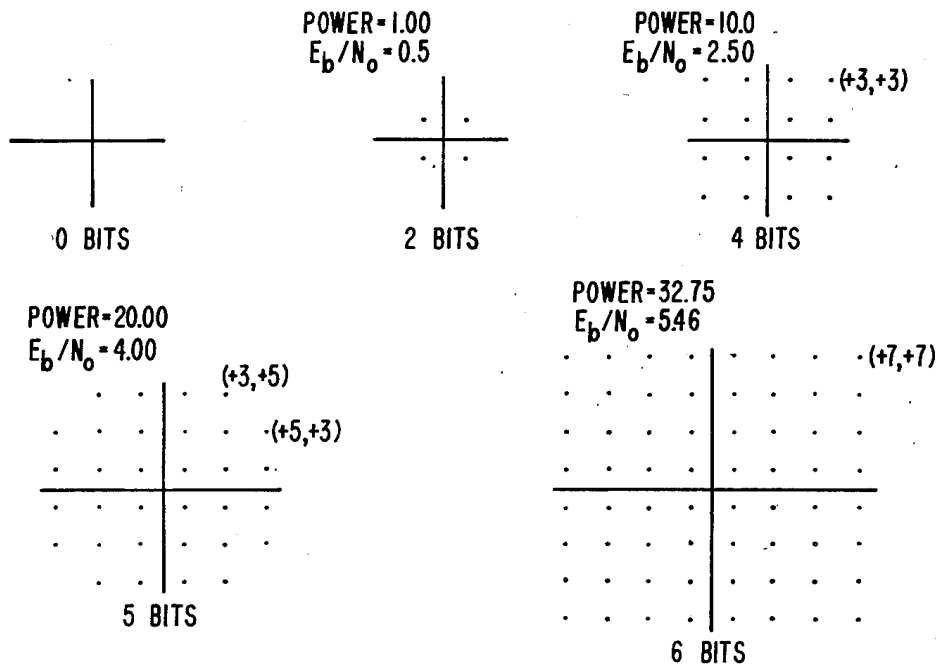


FIG. 5.

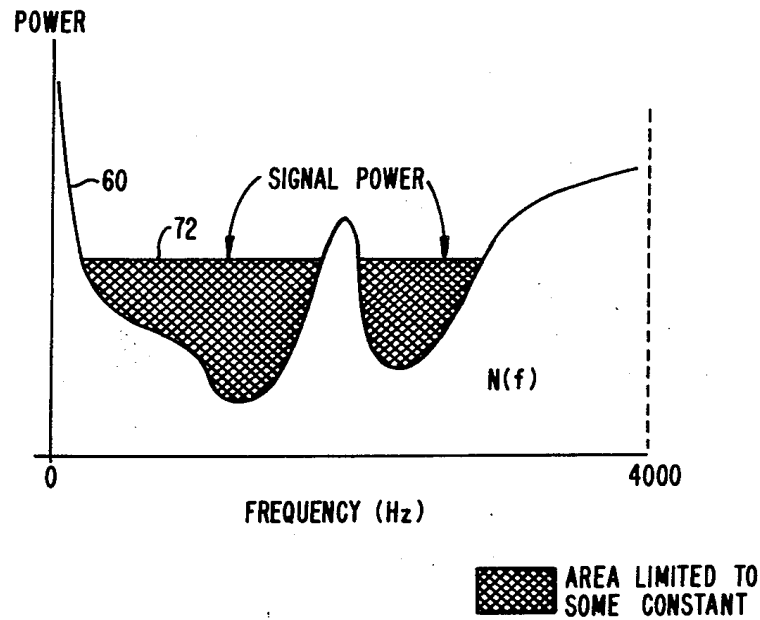


FIG. 6.

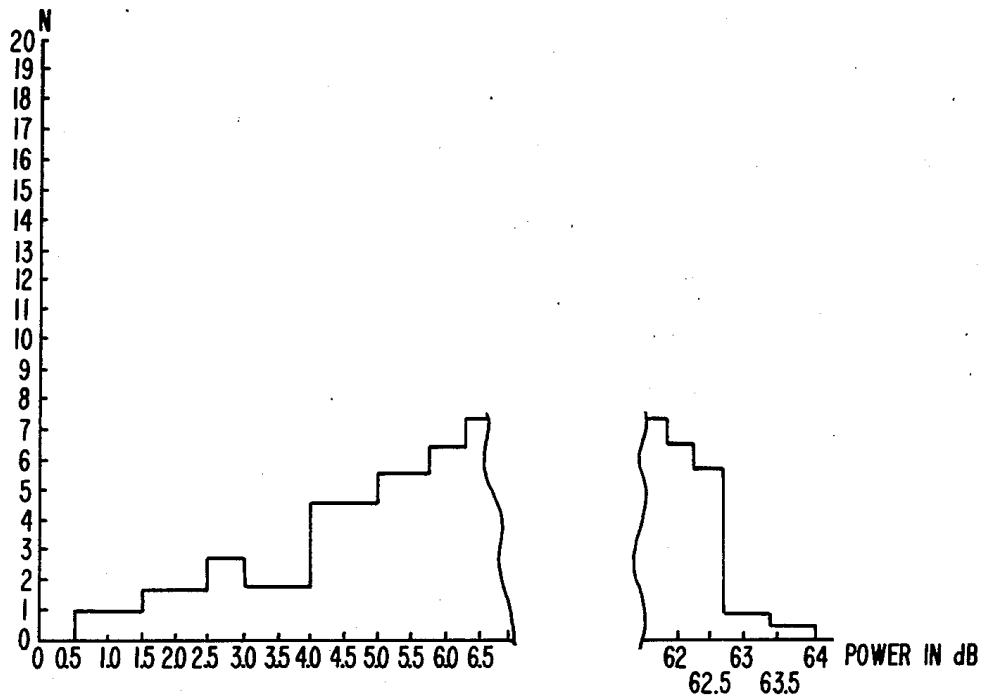


FIG. 7.

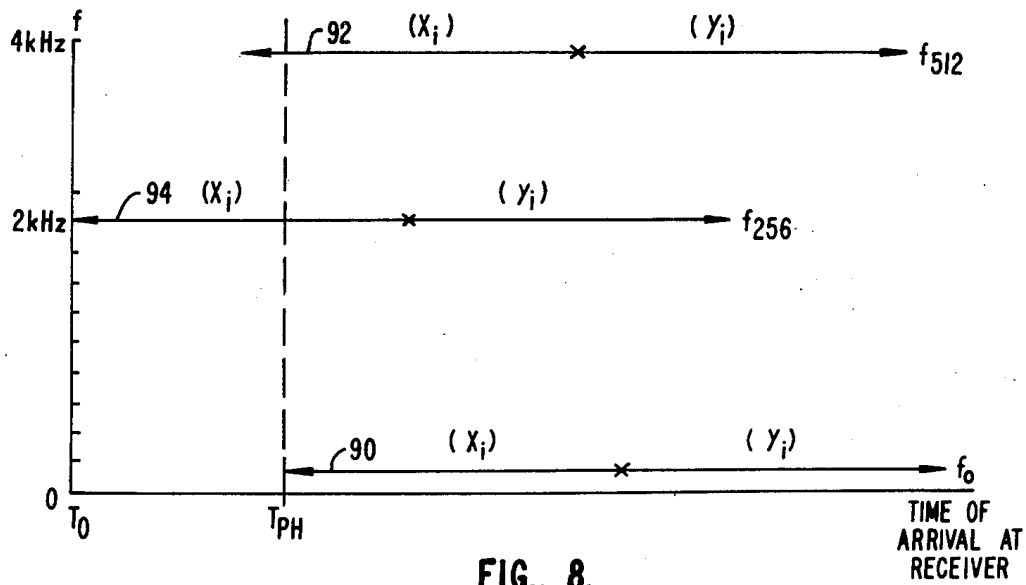


FIG. 8.

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