

- [54] **ENSEMBLE MODEM STRUCTURE FOR IMPERFECT TRANSMISSION MEDIA**
- [75] **Inventor:** Dirk Hughes-Hartogs, Morgan Hill, Calif.
- [73] **Assignee:** Telebit Corporation, Mountain View, Calif.
- [21] **Appl. No.:** 140,848
- [22] **Filed:** Jan. 5, 1988

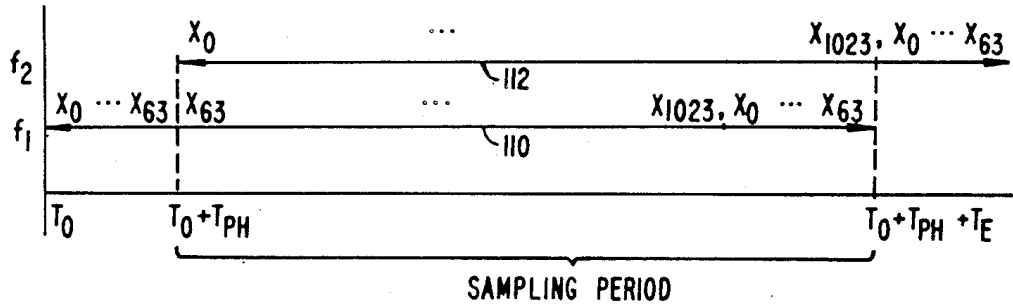
- [56] **References Cited**  
**U.S. PATENT DOCUMENTS**  
 4,206,320 6/1980 Keasler et al. .... 375/38 X  
 4,438,511 3/1984 Baran ..... 370/19 X
- OTHER PUBLICATIONS**  
 "Information Theory and Reliable Communication", R. Gallager, John Wiley & Sons, New York 1968, pp. 383-431.
- Primary Examiner*—Jin F. Ng  
*Assistant Examiner*—Randall S. Vaas  
*Attorney, Agent, or Firm*—Townsend and Townsend

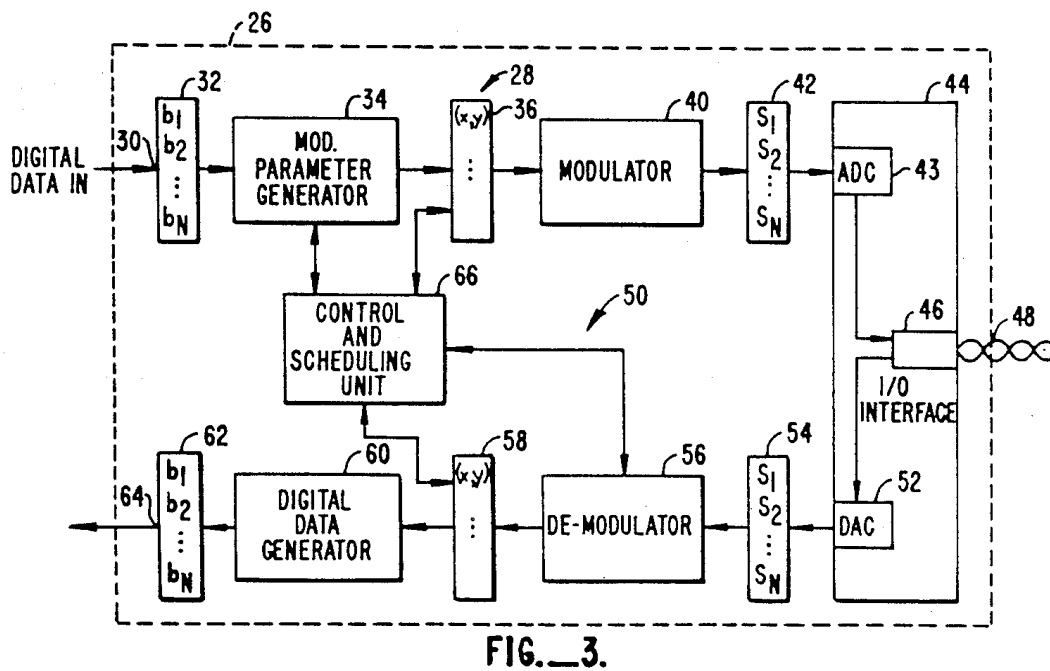
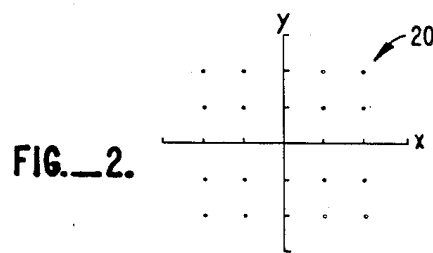
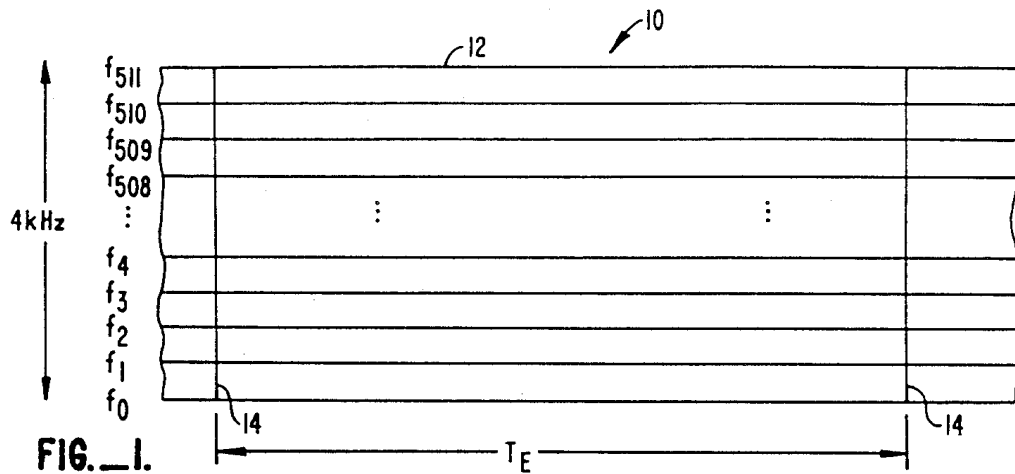
**Related U.S. Application Data**

- [62] Division of Ser. No. 2,096, Jan. 12, 1987, Pat. No. 4,731,816, which is a division of Ser. No. 736,200, May 20, 1985, Pat. No. 4,679,227.
- [51] **Int. Cl.<sup>4</sup>** ..... **H04M 11/00**
- [52] **U.S. Cl.** ..... **379/98; 370/19; 375/39**
- [58] **Field of Search** ..... 375/38, 39, 40, 58, 375/118; 455/63, 68; 340/825.15; 370/16, 19, 69.1, 70, 100, 106, 108; 379/93, 97, 98

[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 the tracking variations in line parameters are disclosed.

**2 Claims, 6 Drawing Sheets**





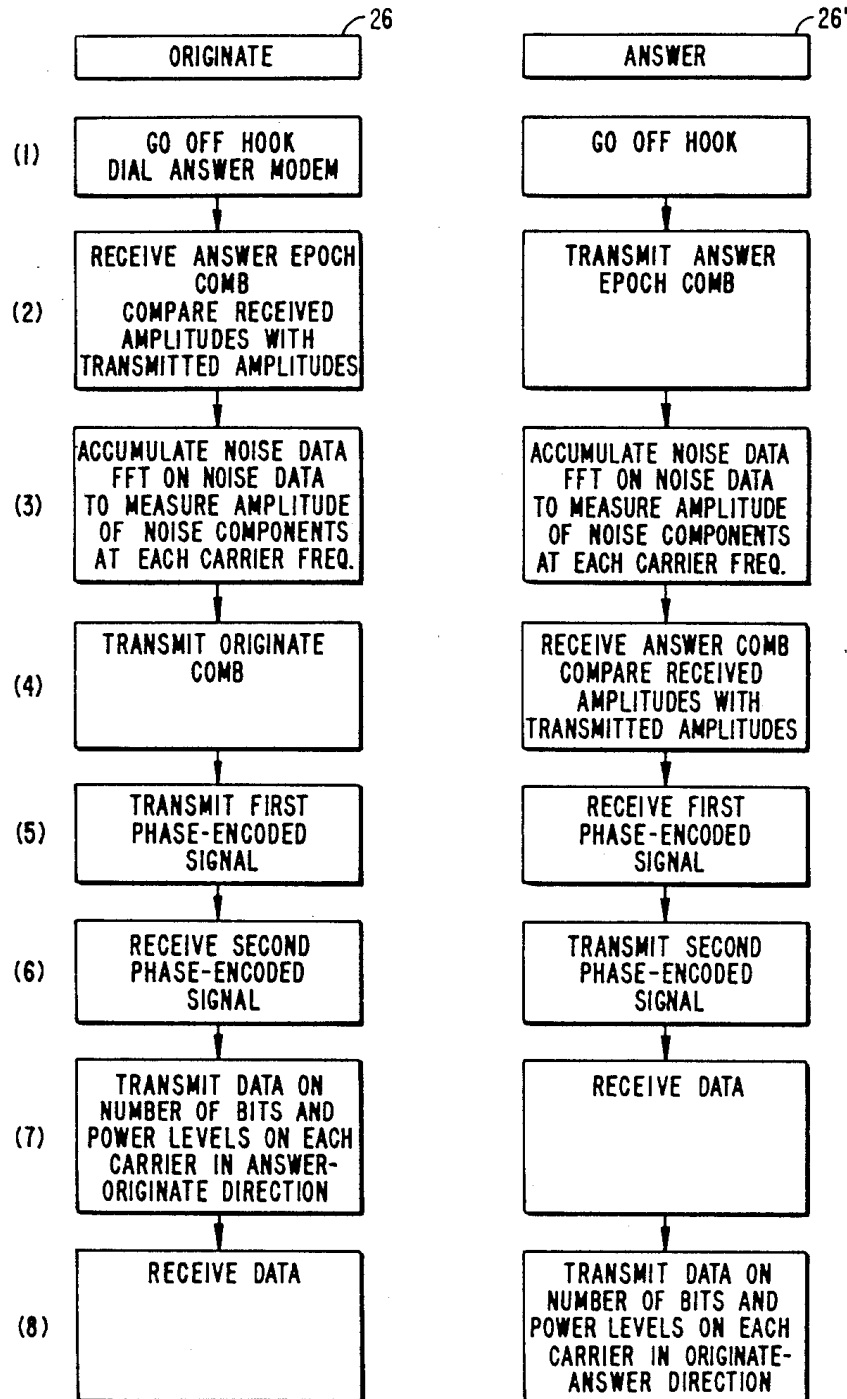


FIG. 4.

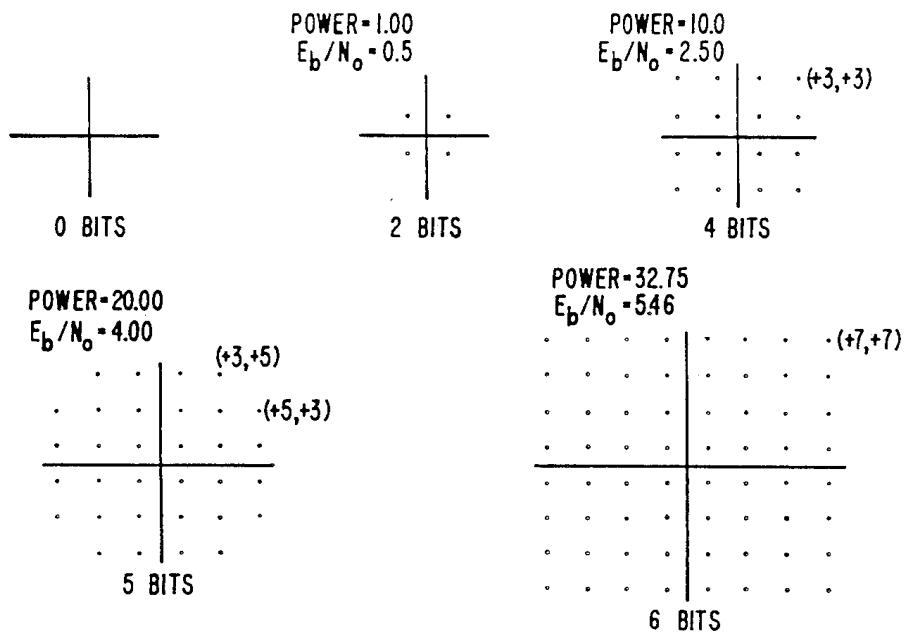


FIG. 5.

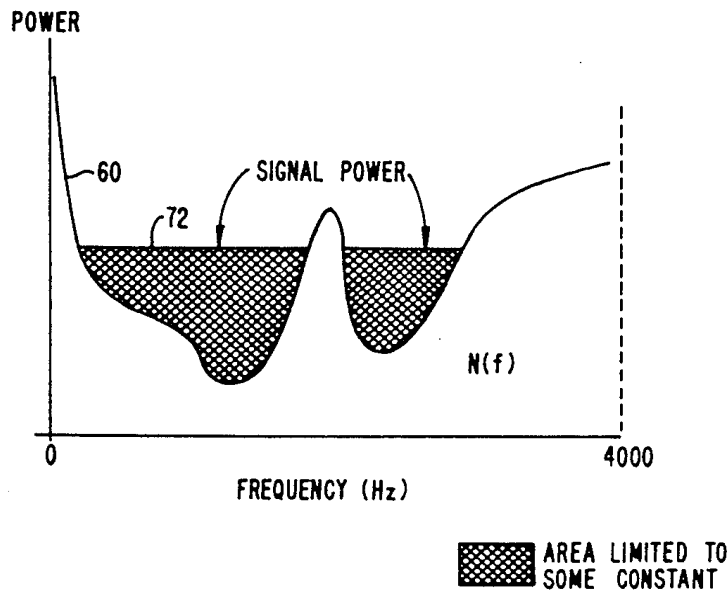


FIG. 6.

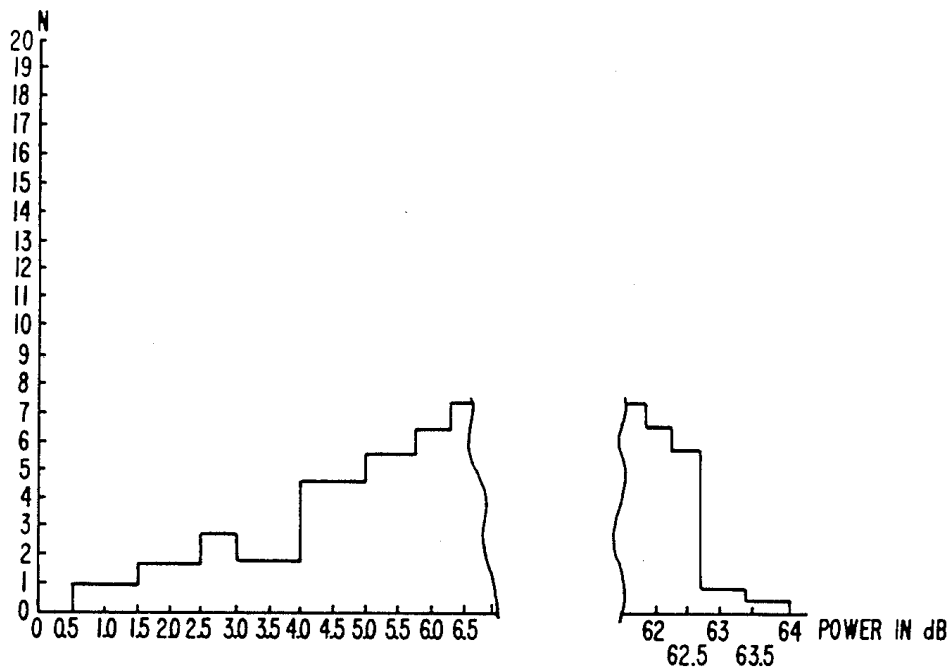


FIG. 7.

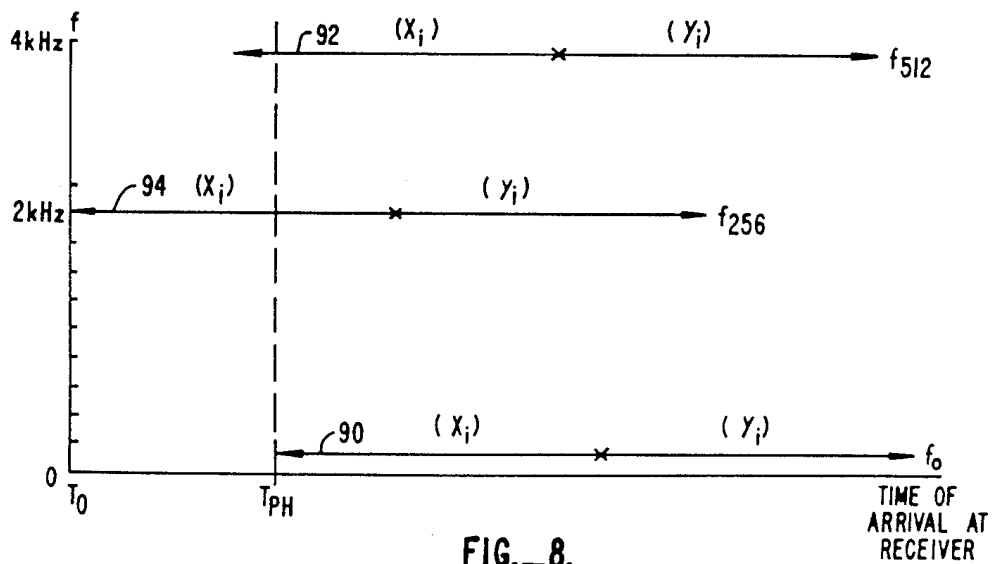


FIG. 8.

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.