

(12) **United States Patent**  
**Austerman, III et al.**

(10) **Patent No.:** **US 6,650,622 B1**  
 (45) **Date of Patent:** **Nov. 18, 2003**

(54) **SYSTEM FOR COMMUNICATING WITH ELECTRONIC EQUIPMENT**

4,340,788 A 7/1982 Sbuelz ..... 370/250  
 4,495,494 A 1/1985 McCune

(List continued on next page.)

(75) Inventors: **John F. Austerman, III**, Huntington Woods, MI (US); **Marshall B. Cummings**, Troy, MI (US)

**FOREIGN PATENT DOCUMENTS**

SE WO 96/29638 9/1996  
 SE WO 97/09667 3/1997  
 WO PCT/IB96/00223 1/1996

(73) Assignee: **ChriMar Systems, Inc.**, Farmington Hills, MI (US)

**OTHER PUBLICATIONS**

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

“Integrated Services Digital Network (ISDN)”, International Telecommunication Union, vol. III, Fascicle III.8, pp. 175–176 and 204–209 (Nov. 14–25, 1988).

Track-It for Windows, 3 pages.

Visual Audit Pro, 2 pages.

(List continued on next page.)

(21) Appl. No.: **09/370,430**

*Primary Examiner*—Chau Nguyen

*Assistant Examiner*—Soon-Dong Hyun

(74) *Attorney, Agent, or Firm*—Harness, Dickey & Pierce, P.L.C.

(22) Filed: **Aug. 9, 1999**

**Related U.S. Application Data**

**ABSTRACT**

(63) Continuation-in-part of application No. PCT/US99/07846, filed on Apr. 8, 1999.

(60) Provisional application No. 60/081,279, filed on Apr. 10, 1998.

(51) **Int. Cl.**<sup>7</sup> ..... **H04L 12/12**; G08B 13/14

In accordance with the teachings of the present invention, a communication system (17) is provided for generating and monitoring data over pre-existing conductors (2A–2D) between associated pieces of networked computer equipment (3A–3D). The system includes a communication device (12) attached to the electronic equipment that transmits information to a central module (15) by impressing a low frequency signal on the pre-existing data lines of the remotely located equipment. A receiver (6) in the central module (15) monitors the low frequency data on the data lines to determine the transmitted information of the electronic equipment. The communication device may also be powered by a low current power signal from the central module (15). The power signal to the communication device may also be fluctuated to provide useful information, such as status information, to the communication device. Relocation of the electronic equipment with attached communication device to another location on the network is detected immediately and may be used to update a database. This invention is particularly adapted to be used with an existing Ethernet communications link or equivalents thereof.

(52) **U.S. Cl.** ..... **370/241**; 340/568.1

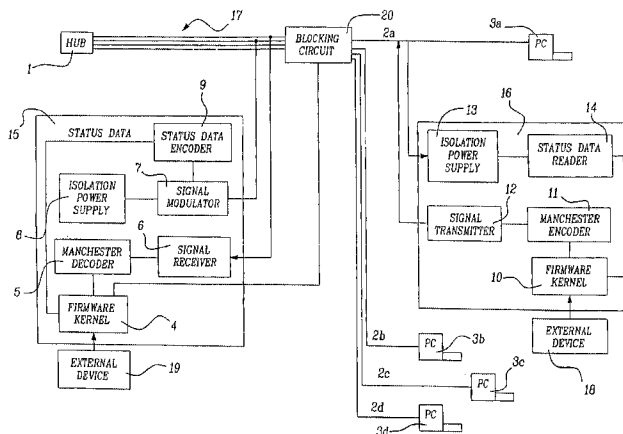
(58) **Field of Search** ..... 370/527, 252, 370/241, 242, 445, 446, 419, 420, 421, 463, 426; 340/568.2, 568.4, 568.1, 571, 572.1, 687, 573.4, 573.1, 505, 506; 375/222

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,359,379 A 12/1967 Pullum et al.  
 3,407,400 A 10/1968 Lurie ..... 340/517  
 3,408,643 A 10/1968 Sliman ..... 340/568.1  
 3,537,095 A 10/1970 Cones ..... 340/517  
 3,696,378 A 10/1972 Daniel ..... 340/568.2  
 3,794,989 A 2/1974 Manley et al. .... 340/517  
 3,863,036 A 1/1975 McCrudden  
 3,932,857 A 1/1976 Way et al. .... 340/568.2  
 4,121,201 A 10/1978 Weathers  
 4,156,799 A 5/1979 Cave  
 4,230,912 A 10/1980 Lee et al.  
 4,273,955 A 6/1981 Armstrong ..... 178/69 G

**20 Claims, 13 Drawing Sheets**



## U.S. PATENT DOCUMENTS

4,617,656	A	*	10/1986	Kobayashi et al.	370/445
4,631,367	A		12/1986	Coviello et al.	
4,636,771	A		1/1987	Ochs	
4,654,640	A	*	3/1987	Carl et al.	340/568.2
4,670,902	A		6/1987	Naiwirt	
4,674,084	A		6/1987	Suzuki et al.	370/509
4,719,616	A		1/1988	Akano	370/527
4,731,829	A		3/1988	Bonnet et al.	
4,733,223	A		3/1988	Gilbert	340/505
4,733,389	A		3/1988	Puvogel	
4,736,195	A		4/1988	McMurtry et al.	
4,760,382	A		7/1988	Faulkner	340/568.2
4,782,322	A		11/1988	Lechner et al.	340/310.02
4,813,066	A		3/1989	Holtz et al.	
4,896,315	A		1/1990	Felker et al.	370/252
4,935,959	A		6/1990	Markovic et al.	
5,034,723	A		7/1991	Maman	340/568.2
5,034,978	A		7/1991	Nguyen et al.	
5,136,580	A		8/1992	Videloock et al.	
5,142,269	A		8/1992	Mueller	
5,144,544	A		9/1992	Jenneve et al.	
5,231,375	A		7/1993	Sanders et al.	340/568.2
5,243,328	A		9/1993	Lee et al.	
5,301,246	A	*	4/1994	Archibald et al.	375/222
5,365,515	A		11/1994	Graham	
5,406,260	A		4/1995	Cummings et al.	340/568.2
5,578,991	A		11/1996	Scholder	
5,675,321	A		10/1997	McBride	340/568.2
5,692,917	A		12/1997	Rieb et al.	439/225
5,715,174	A		2/1998	Cotichini et al.	
5,821,868	A		10/1998	Kuhling	
5,929,778	A	*	7/1999	Asama et al.	340/10.51
5,963,557	A	*	10/1999	Eng	370/432
6,021,493	A	*	2/2000	Cromer et al.	713/200
6,064,305	A		5/2000	Lockyer	
6,130,894	A	*	10/2000	Ojard et al.	370/421
6,147,603	A		11/2000	Rand	340/568.2
6,172,606	B1		1/2001	Lockyer	340/568.2
6,344,794	B1	*	2/2002	Ulrich et al.	340/573.1

## OTHER PUBLICATIONS

Lavoisard, J.L. et al, Les Installations Terminales D'Abonnes, Commutation & Transmission No. 3, 1987, pp. 35-50.

An Interoperable Solution for FDDI Signaling Over Shielded Twisted Pair, Advanced Micro Devices, Inc., May 21, 1991, 9 pgs.

FDDI on Copper with AMD PHY, Advanced Micro Devices, 1991, 8 pgs.

Information Processing Systems—Fibre Distributed Data Interface (FDDI) Part 1: Token Ring Physical Layer Protocol (PHY), Global Engineering Documents, 1989, 38 pgs.

Information Processing Systems—Fibre Distributed Data Interface (FDDI) Part 3: Physical Layer Medium Dependent, Global Engineering Documents, 1989, 55 pgs.

Information Processing Systems—Fibre Distributed Data Interface (FDDI) Part 2: Token Ring Media Access Control (MAC), Global Engineering Documents, 1989, 75 pgs.

“Attachment Module Guide for the IBM Token-Ring Network”, IBM, Apr. 1992.

“Token Ring Access Method”, The Institute of Electrical and Electronics Engineers, Inc., 1985, 80 pages.

LattisNet System 3000 Ethernet Connectivity Guide, Syn-Optics Communications, Inc., Sep. 1991, 19 pages.

Stallings, William, Local Networks (Second Edition), 435 pages.

FDDI Metallic Media—Shielded Twisted Pair Physical Layer Medium Dependent, British Telecom, Oct. 15, 1991.

Letter of Assurance Process Flowchart, IEEE, 2 pages.

IEEE-SA Standards Board Bylaws, 3 pages.

Keller, R. et al, “Performance Bottlenecks in Digital Movie Systems”, Proceedings of the 4<sup>th</sup> International Workshop on Network and Operating System Support for Digital Audio and Video, Lancaster, U.K., Nov. 1993, 13 pages.

LattisNet System 3000 Ethernet Connectivity Guide, Syn-Optics Communications, Inc., Sep. 1991, 12 pages.

Chapter I LattisNet Operation, Ethernet Connectivity Guide, 145 pages.

LattisNet System 3000 Ethernet Connectivity Guide, Sep. 1991, 19 pages.

Technical Response Center, Technical Tip, Bay Networks, 2 pages.

LattisNet System 3000 Ethernet Connectivity Guide, Sep. 1991, 7 pages.

Local Area Networks, Managing the Physical Layer, International Data Corporation, Mar. 1990, 36 pages.

Levine, Judy, FDDI Spec Consortium, 21 pages.

Stallings, William, Local Networks, An Introduction.

An Interoperable Solution for FDDI Signaling Over Shielded Twisted Pair, Advanced Micro Devices, May 21, 1991, 25 pages.

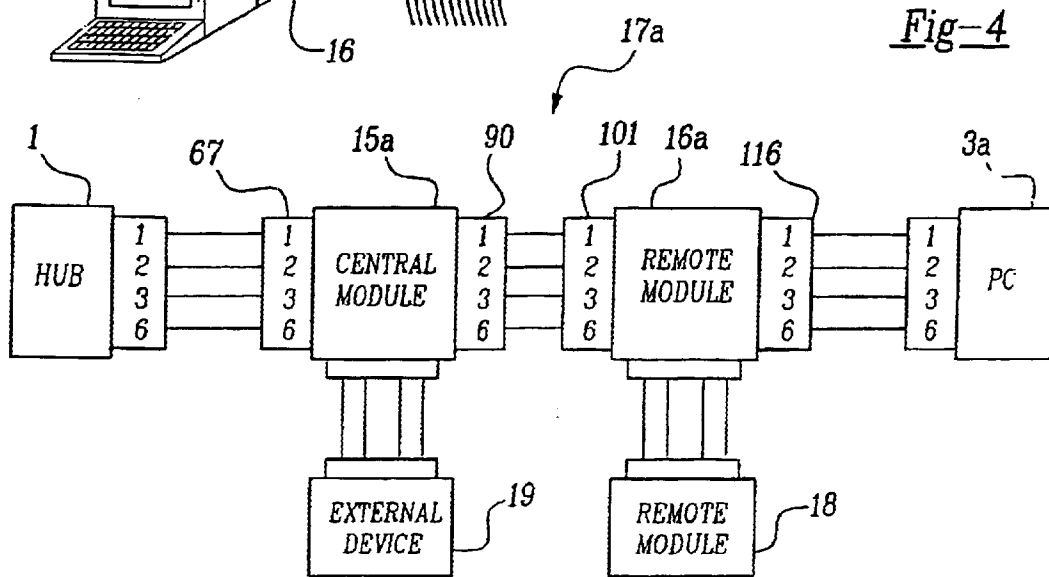
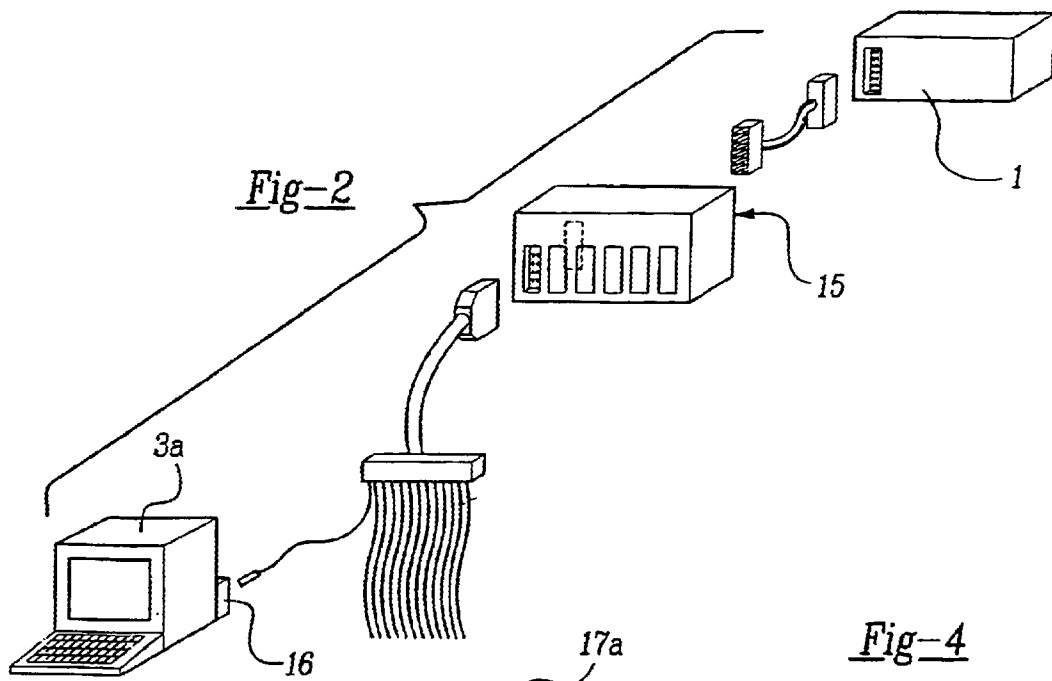
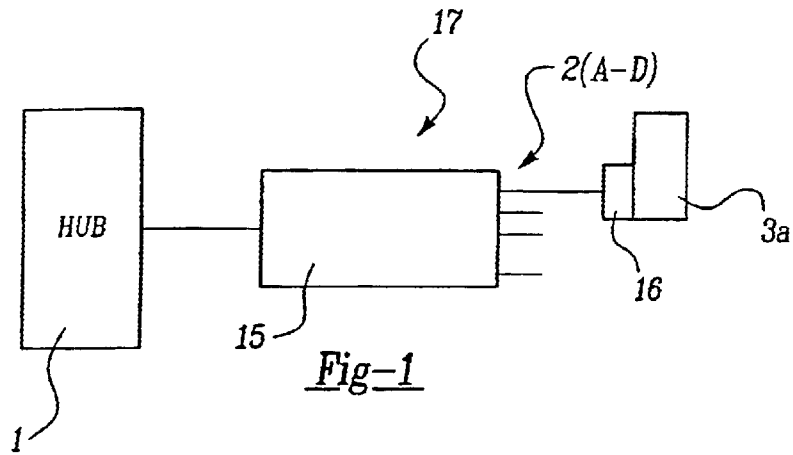
Token Ring Network Architecture Reference, IBM, 15 pages.

Reference Data for Engineers: Radio, Electronics, Computer and Communications, 1989, 17 pages.

IEEE Network Magazine, vol. 1, No. 1, Jan. 1987, 30 pages.

System Consideration for Multisegment 10 Mb/s Baseband Networks, (Section 13) and Twisted Pair Medium Attachment Unit (MAU) and Baseband Medium, Type 10BASE-T (Section 14), 33 pages.

\* cited by examiner





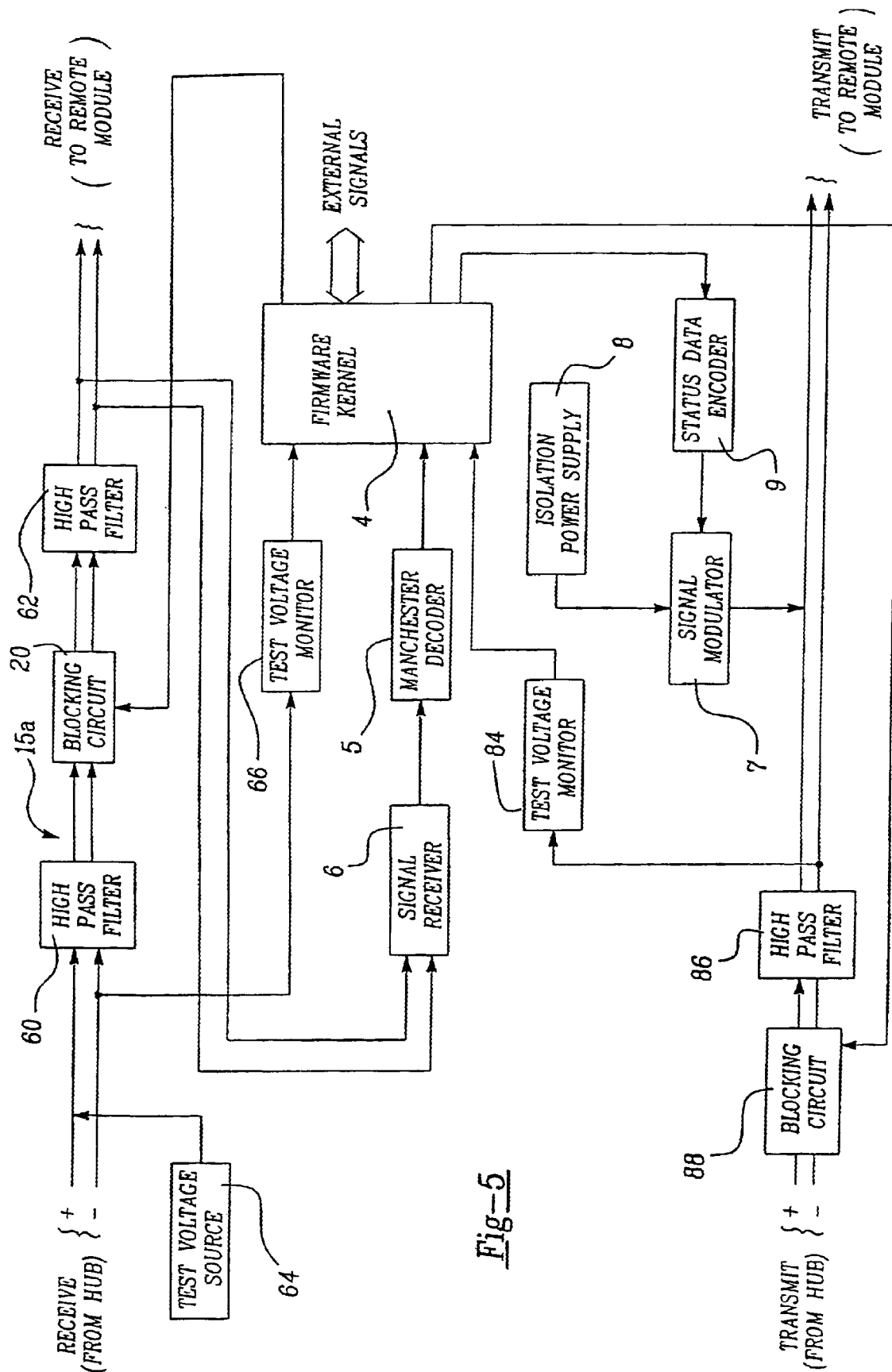


Fig-5

# 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.