



US005854985A

# United States Patent [19]

[11] Patent Number: **5,854,985**

Sainton et al.

[45] Date of Patent: **Dec. 29, 1998**

- [54] **ADAPTIVE OMNI-MODAL RADIO APPARATUS AND METHODS**
- [75] Inventors: **Joseph B. Sainton**, Newburg, Oreg.;  
**Charles M. Leedom, Jr.**, Falls Church;  
**Eric J. Robinson**, Ashburn, both of Va.
- [73] Assignee: **Spectrum Information Technologies, Inc.**, Purchase, N.Y.
- [21] Appl. No.: **707,262**
- [22] Filed: **Sep. 4, 1996**

"Motorola Paging & Wireless Data Group", Bob Growney and William Davies, pp. 155 and 156, Portable Computers Wireless Communications, 1993.

"Racotek", Richard Cortese and Larry Sanders, pp. 176-178, Portable Computers and Wireless Communications, 1993.

*Primary Examiner*—Edward F. Urban  
*Attorney, Agent, or Firm*—Sixbey, Friedman, Leedom & Ferguson; Charles M. Leedom, Jr.

### Related U.S. Application Data

- [63] Continuation of Ser. No. 167,003, Dec. 15, 1993, abandoned.
- [51] **Int. Cl.<sup>6</sup>** ..... **H04Q 7/32**
- [52] **U.S. Cl.** ..... **455/553; 455/426; 455/557; 455/566**
- [58] **Field of Search** ..... 455/33.1, 33.2, 455/33.4, 54.1, 54.2, 56.1, 74, 84, 89, 432, 434, 435, 552, 524, 553, 426, 557; 379/59, 60

### [57] ABSTRACT

A frequency and protocol agile wireless communication product, and chipset for forming the same, including a frequency agile transceiver, a digital interface circuit for interconnecting the radio transceiver with external devices, protocol agile operating circuit for operating the radio transceiver in accordance with one of the transmission protocols as determined by a protocol signal and an adaptive control circuit for accessing a selected wireless communication network and for generating the frequency control signal and the protocol control signal in response to a user defined criteria. Among the possible user defined criteria would be (1) the cost of sending a data message, (2) the quality of transmission link (signal strength, interference actual or potential), (3) the potential for being bumped off of the system (is service provider at near full capacity), (4) the security of transmission, (5) any special criteria which the user could variably program into his omni-modal wireless product based on the user's desires or (6) any one or more combinations of the above features that are preprogrammed, changed or overridden by the user. The disclosed invention allows wireless service providers to broadcast electronically as part of any "handshaking" procedure with an omni-modal wireless product information such as (1) rate information and (2) information regarding system operating characteristics such as percent of system capacity in use and/or likelihood of being dropped. The disclosed invention creates a user oriented source enrollment and billing service in the wireless data market by establishing uniform standard for "handshakes" to occur between cell service providers and omni-modal wireless products.

### [56] References Cited

#### U.S. PATENT DOCUMENTS

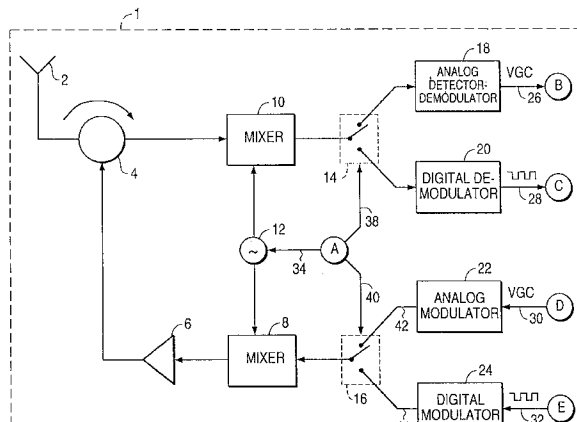
- 4,144,496 3/1979 Cunningham et al. .... 455/54.1
- 4,371,751 2/1983 Hilligoss, Jr. et al. .
- 4,558,453 12/1985 Mimken .
- 4,578,796 3/1986 Charalambous et al. .
- 4,741,049 4/1988 De Jager et al. .
- 4,811,420 3/1989 Avis et al. .
- 4,833,727 5/1989 Calvet et al. .
- 4,985,904 1/1991 Ogawara .
- 5,020,094 5/1991 Rash et al. .
- 5,077,834 12/1991 Andros et al. .

(List continued on next page.)

#### OTHER PUBLICATIONS

\*"Electronic Messaging System (EPS)", Feb. 5, 1993, Complex Architectures, Inc.

**15 Claims, 16 Drawing Sheets**



U.S. PATENT DOCUMENTS

5,122,795	6/1992	Cublely et al. .	5,239,701	8/1993	Ishii .
5,127,042	6/1992	Gillig et al. .... 455/33.1 X	5,249,302	9/1993	Metroka et al. .
5,134,709	7/1992	Bi et al. .	5,261,117	11/1993	Olson ..... 455/54.2 X
5,179,360	1/1993	Suzuki ..... 455/86 X	5,293,628	3/1994	Sasuta et al. .... 455/34.1 X
5,200,991	4/1993	Motoyanagi .	5,301,359	4/1994	Van Den Heuvel et al. .... 455/524
5,201,067	4/1993	Grube et al. .	5,343,513	8/1994	Kay et al. .... 455/34.1 X
			5,649,308	7/1997	Andrews ..... 455/84

FIG. 1A

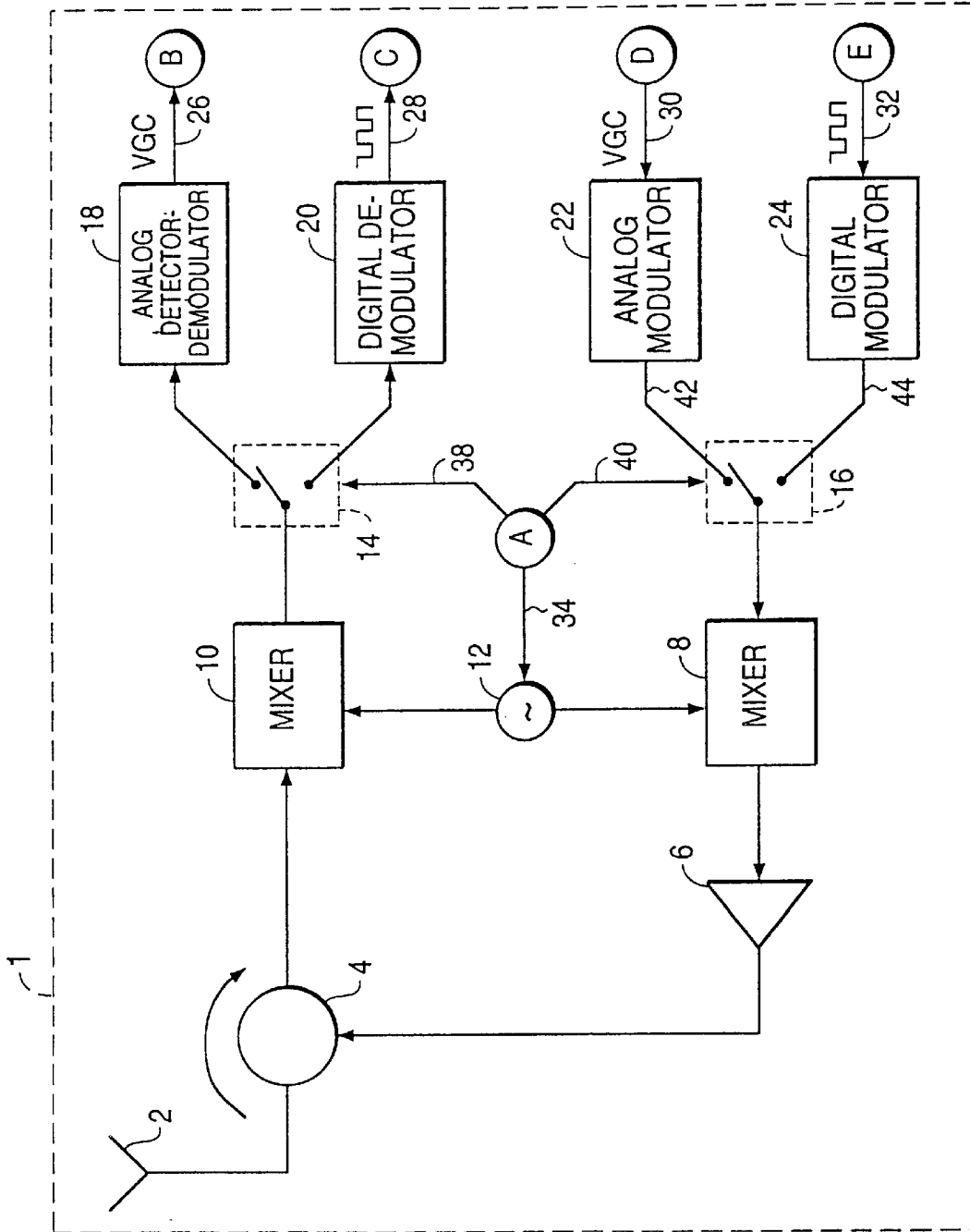


FIG. 1B

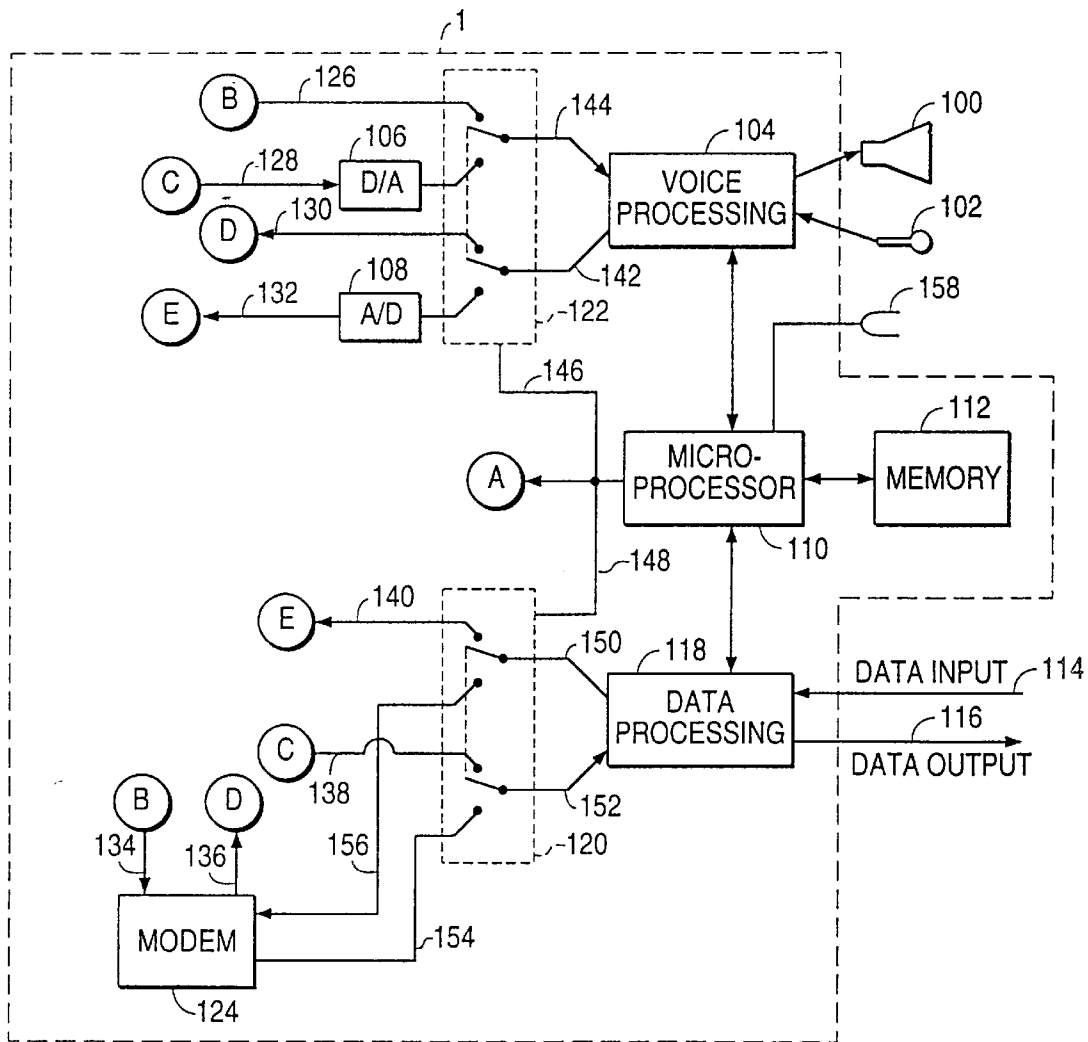
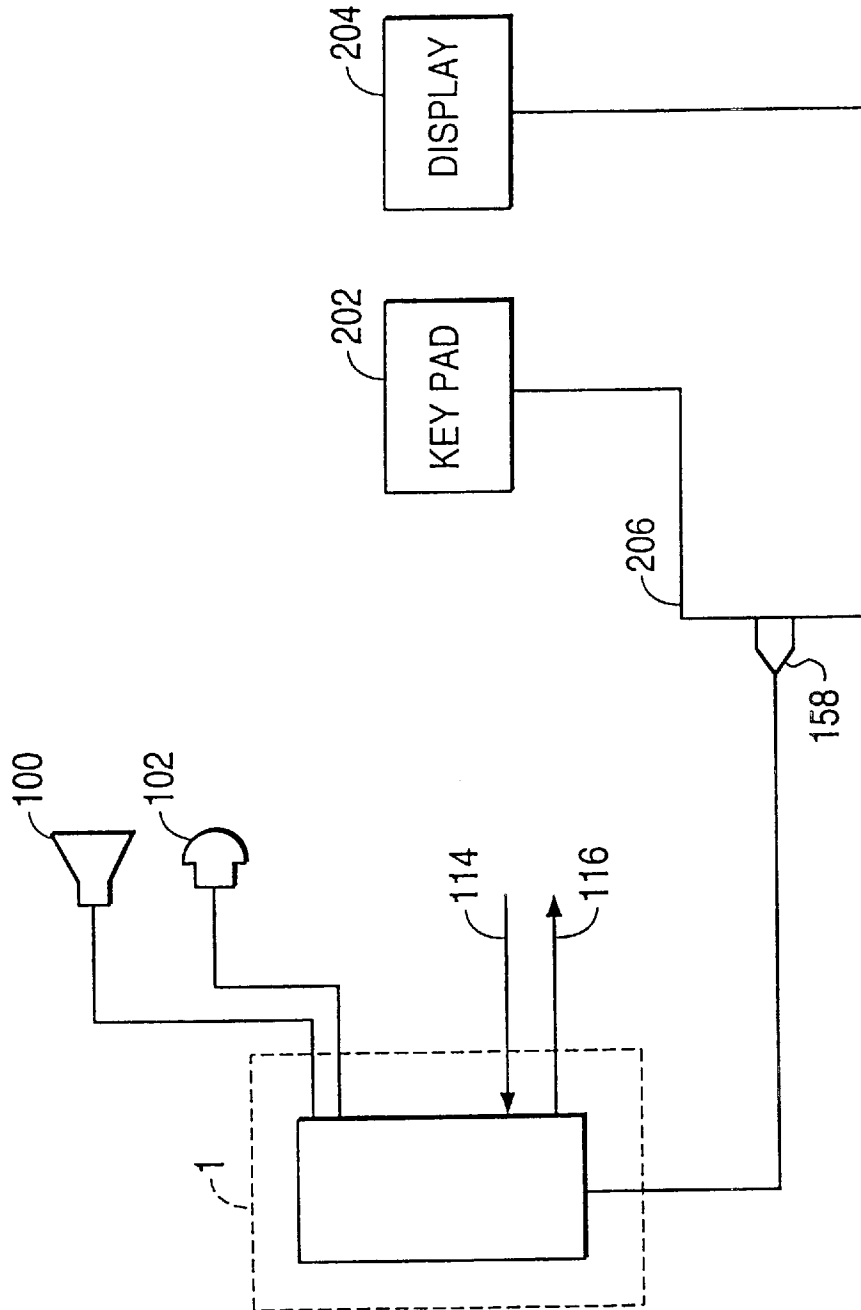


FIG. 2



# 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.