

US005764704A

United States Patent [19]

Shenoi

[11] Patent Number: **5,764,704**

[45] Date of Patent: **Jun. 9, 1998**

[54] **DSP IMPLEMENTATION OF A CELLULAR BASE STATION RECEIVER**

[75] Inventor: **Kishan Shenoi**, Saratoga, Calif.

[73] Assignee: **SymmetriCom, Inc.**, San Jose, Calif.

[21] Appl. No.: **664,705**

[22] Filed: **Jun. 17, 1996**

[51] Int. Cl.⁶ **H04L 27/14; H03D 3/00**

[52] U.S. Cl. **375/324; 375/326; 329/327**

[58] Field of Search **375/229, 260, 375/271, 316, 322, 324, 326; 329/315, 327; 455/205**

[56] **References Cited**

U.S. PATENT DOCUMENTS

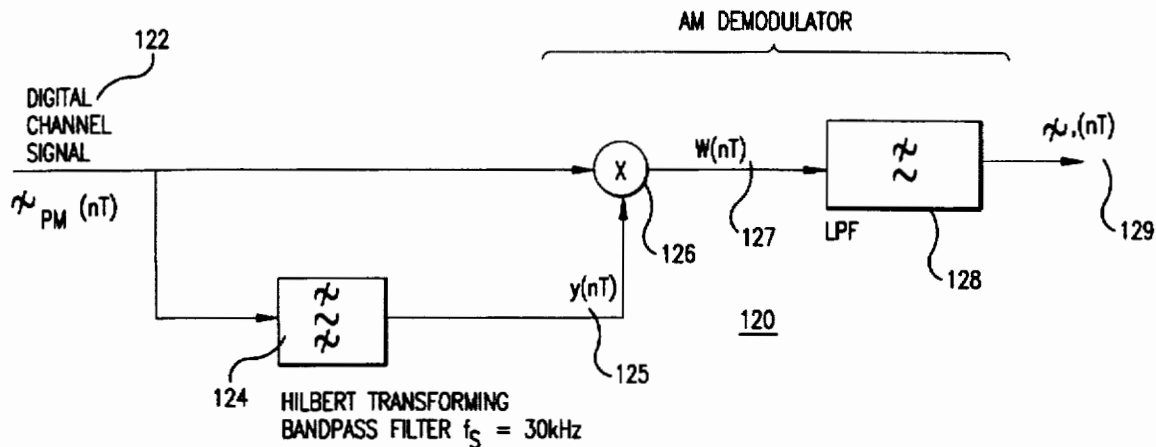
3,634,773	1/1972	Kobayashi	329/311
4,803,739	2/1989	Daikoku	455/47
5,177,611	1/1993	Gibson et al.	348/611
5,434,577	7/1995	Baghdady	342/380

Primary Examiner—Chi H. Pham
Assistant Examiner—Emmanuel Bayard
Attorney, Agent, or Firm—Wilson Sonsini Goodrich & Rosati

[57] **ABSTRACT**

Demodulating FM signals using digital signal processing extracts a carrier signal from digitized channel signals, multiplies the digital channel signal with this extracted carrier signal, and further filters out the carrier signal to produce the demodulated signal. The DSP technique first down converts a group of channels to baseband which are then processed through an A/D converter to produce a digitized composite signal. A bank of bandpass filters, typically based on FFT processors, applied to the composite signal produce (a group of) digitized channel signal(s). The digitized channel signal is then demodulated by recovering a carrier signal by digitally filtering, for example, using a Hilbert bandpass filter, the channel signal and digitally filtering the product of the carrier signal and the channel signal to recover the modulating voice signals.

15 Claims, 8 Drawing Sheets



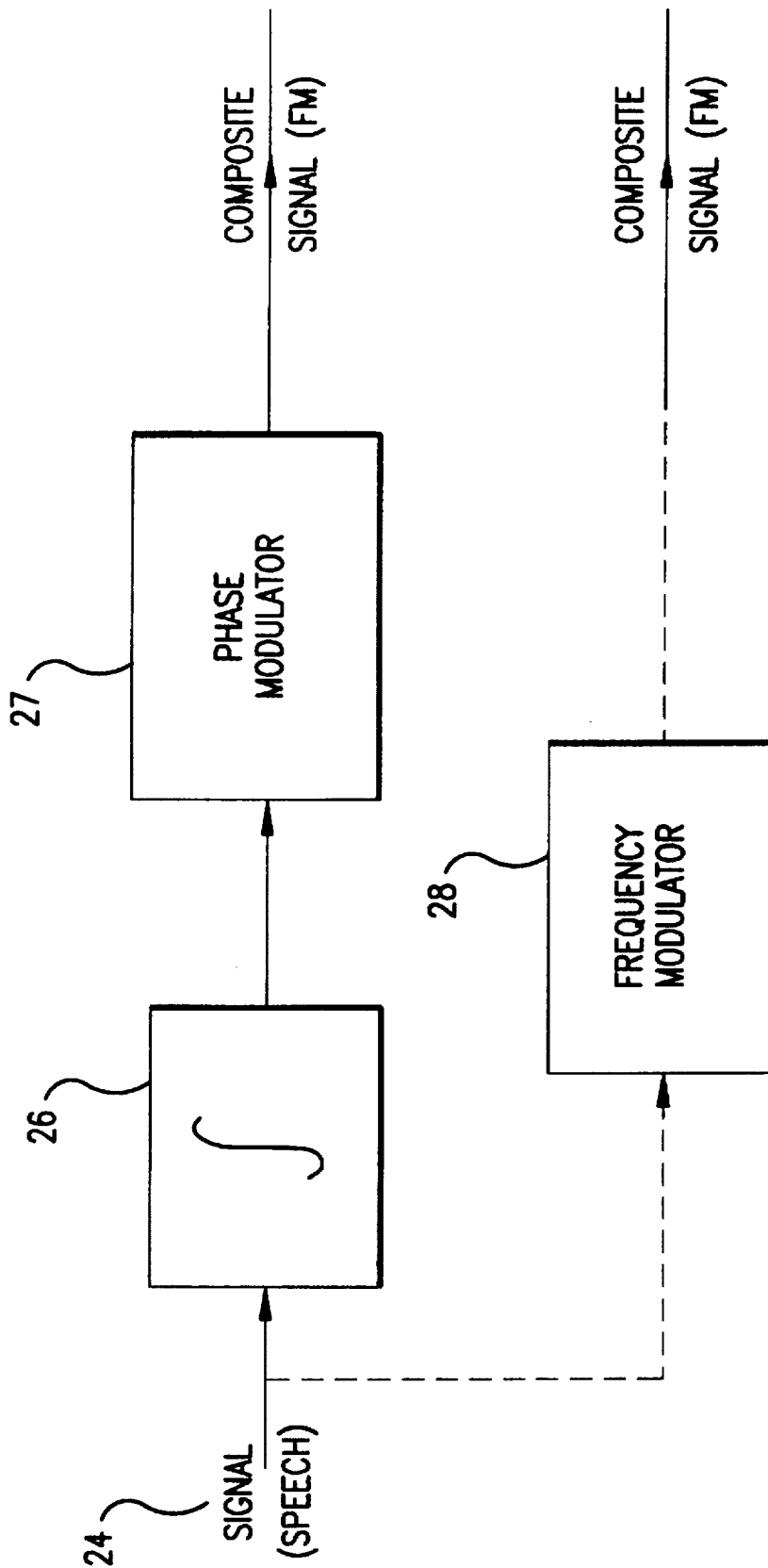
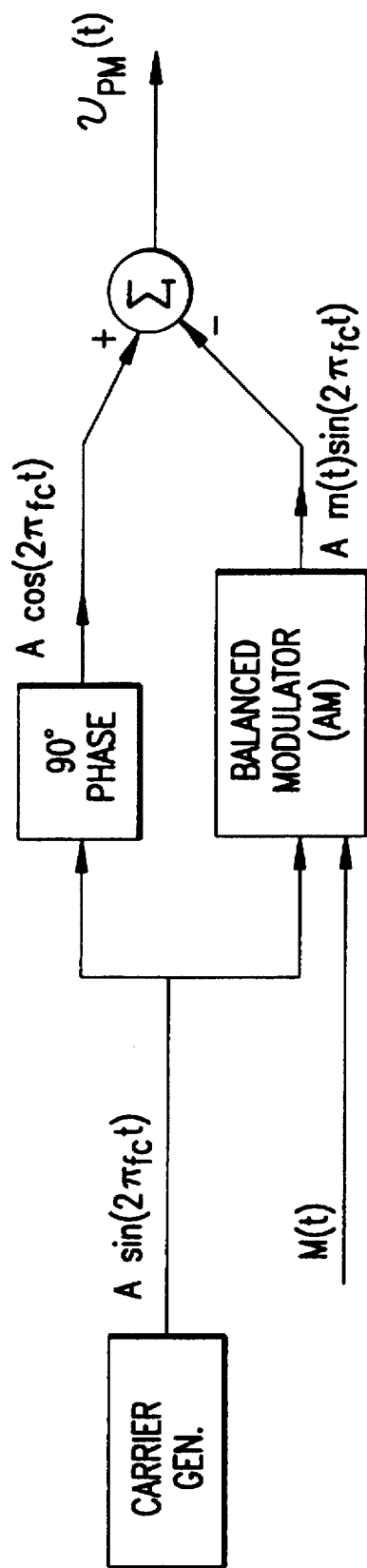


FIG.1



110

FIG.2

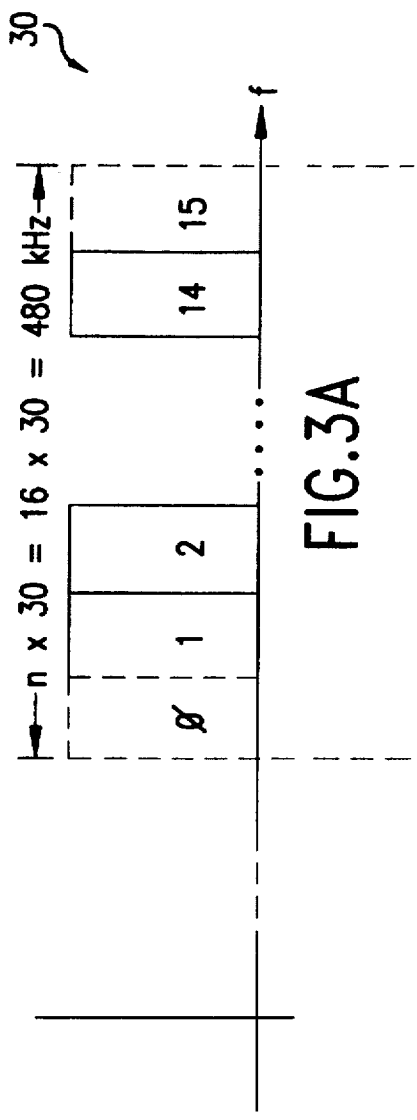
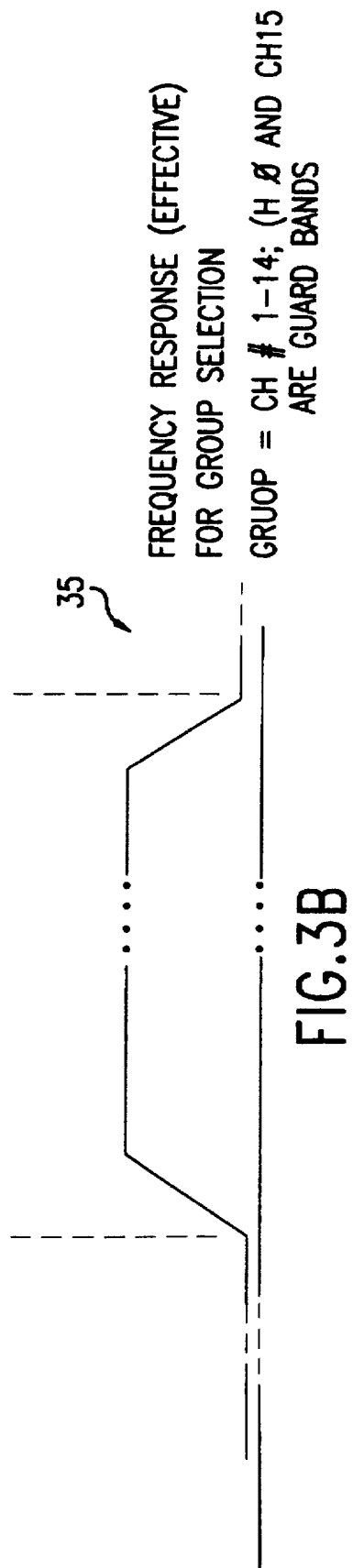


FIG. 3A



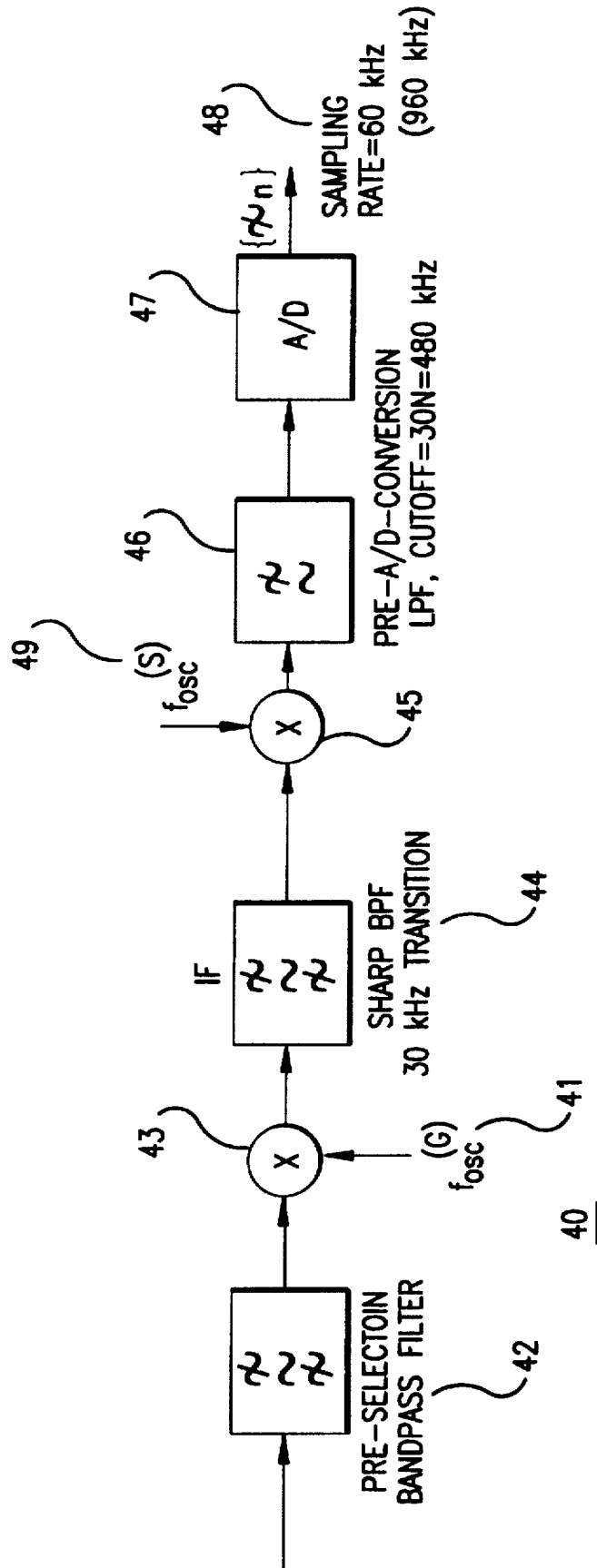


FIG.3C

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.