



[54] MULTI-SUBCARRIER MODULATION FOR HDTV TRANSMISSION

[75] Inventor: Lee-Fang Wei, Lincroft, N.J.

[73] Assignee: AT&T Bell Laboratories, Murray Hill, N.J.

[21] Appl. No.: 753,491

[22] Filed: Sep. 3, 1991

[51] Int. Cl.⁵ H04L 27/04; H04L 27/12; H04L 27/20

[52] U.S. Cl. 375/59; 375/38; 375/100; 375/102; 371/37.1; 371/43

[58] Field of Search 375/27, 38, 40, 100, 375/102, 58, 59; 370/69.1, 71, 73; 371/43, 37.1; 455/8

[56] References Cited

U.S. PATENT DOCUMENTS

3,988,679	10/1976	Clarke et al.	375/102
4,613,975	9/1986	Aoyagi et al.	375/102
4,622,680	11/1986	Zinser	375/38
4,715,048	12/1987	Masamura	375/100
4,831,636	5/1989	Taniguchi et al.	375/27
4,868,851	9/1989	Trinidad et al.	375/40
4,890,283	12/1989	Tsinberg et al.	375/27

4,903,126	2/1990	Kassatly	370/69.1
4,935,940	6/1990	Reindl	375/100
4,980,897	12/1990	Decker et al.	375/38

OTHER PUBLICATIONS

Co-pending application V. B. Lawrence et al, Ser. No. 07/611,225 filed Nov. 7, 1990, entitled "Coding for Digital Transmission".

Co-pending application L. -F. Wei, Ser. No. 07/611,200 filed Nov. 7, 1990, entitled "Coded Modulation with Unequal Error Protection".

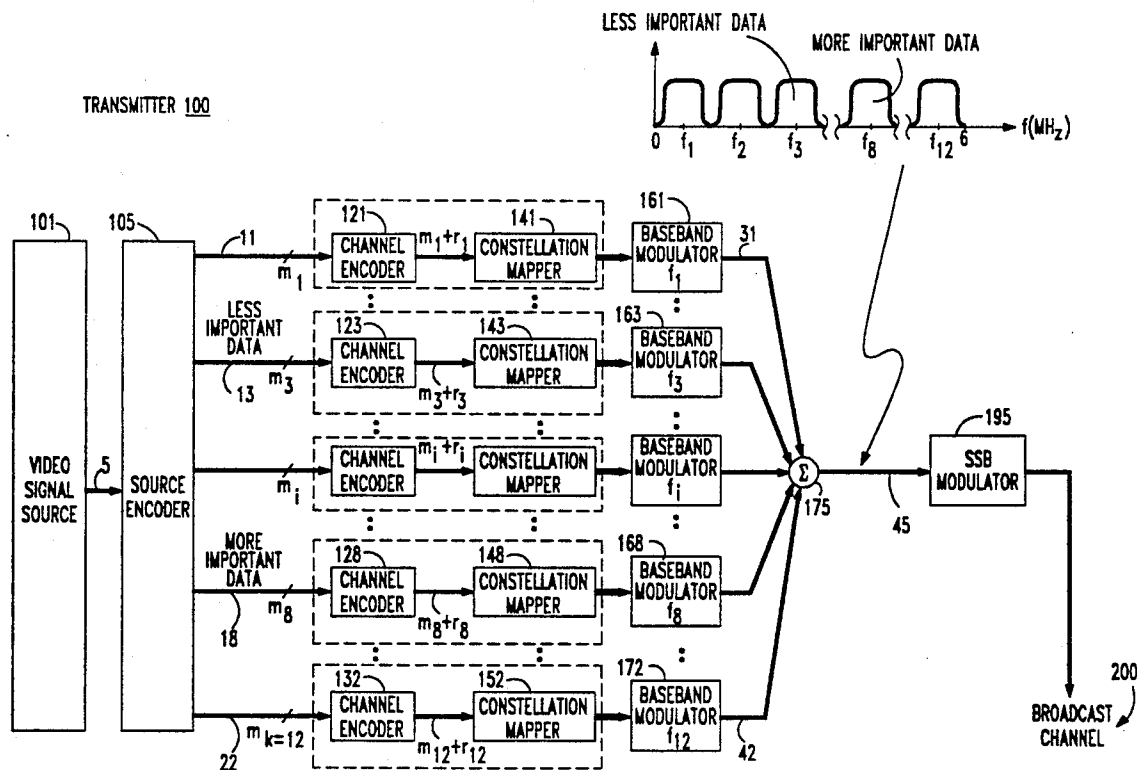
Co-pending application J. D. Johnston et al, Ser. No. 07/625,349 filed Dec. 11, 1990, entitled "A High Definition Television Coding Arrangement with Graceful Degradation".

Primary Examiner—Curtis Kuntz
Assistant Examiner—Don N. Vo
Attorney, Agent, or Firm—Henry T. Brendzel

[57] ABSTRACT

A high definition television (HDTV) signal is transmitted by a multi-subcarrier transmission scheme in which each subcarrier is used to carry a different class of HDTV information.

24 Claims, 4 Drawing Sheets



MICROSOFT CORP. ET AL.
EXHIBIT 1004

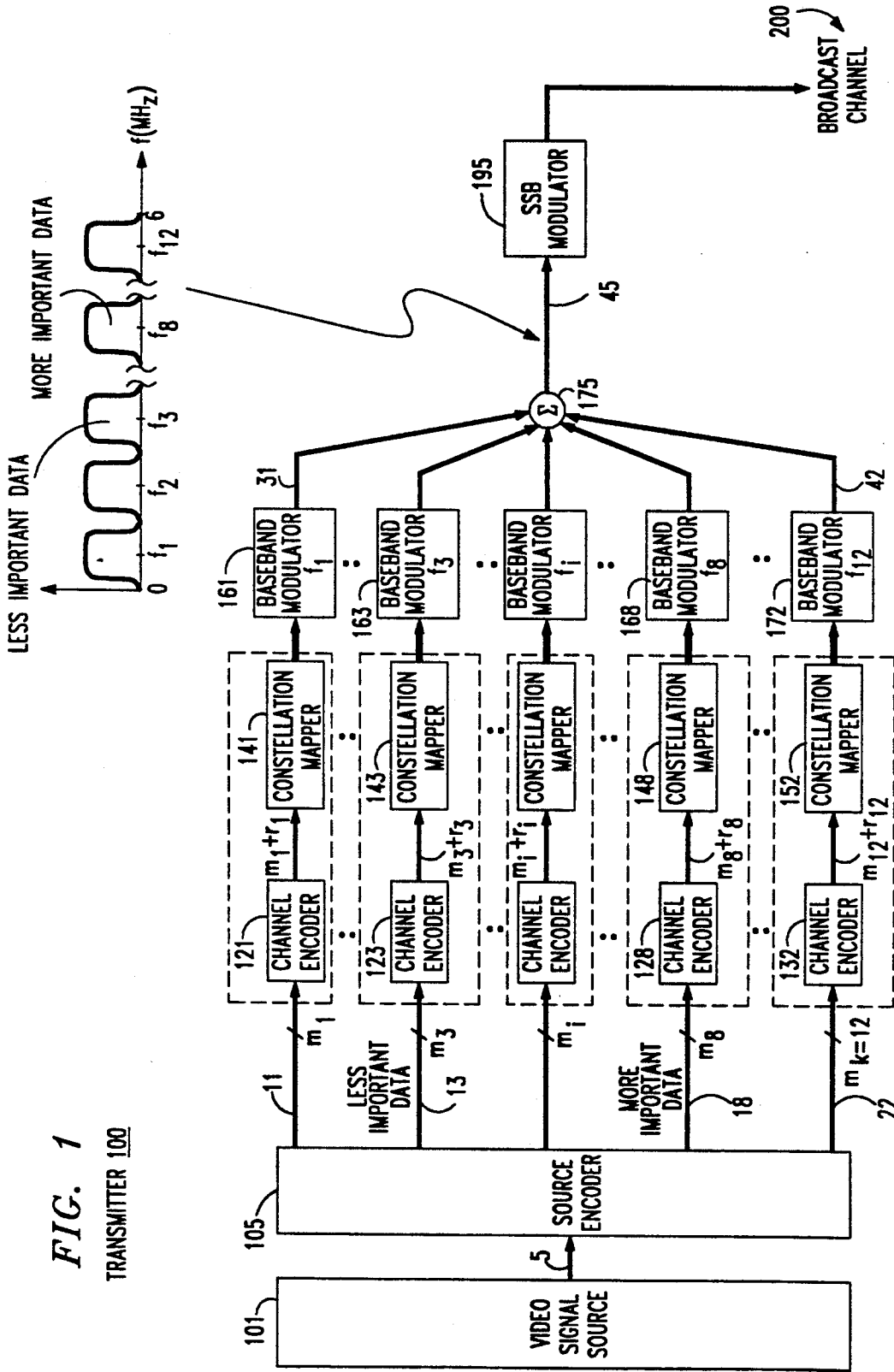
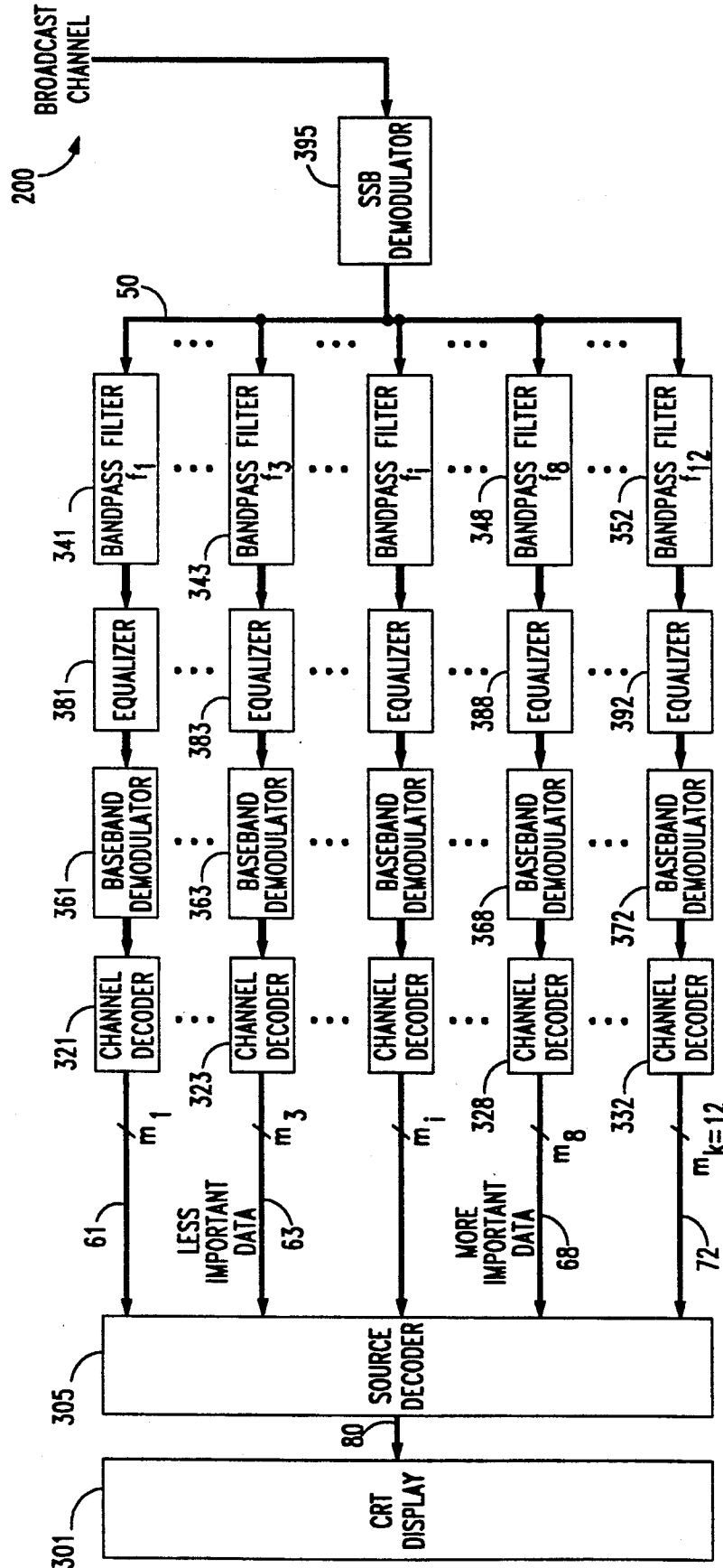


FIG. 2 RECEIVER 300



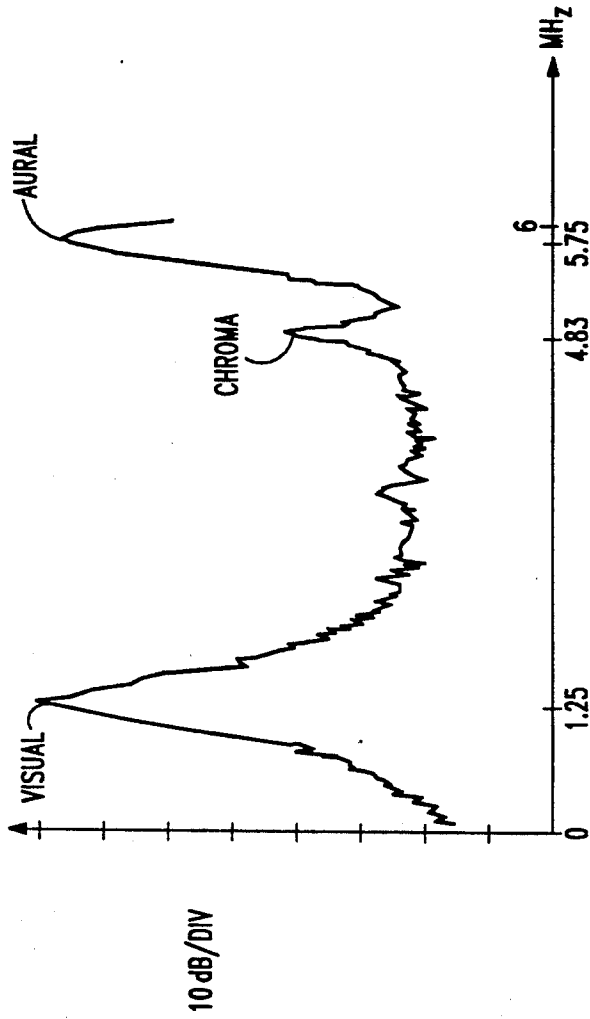


FIG. 3

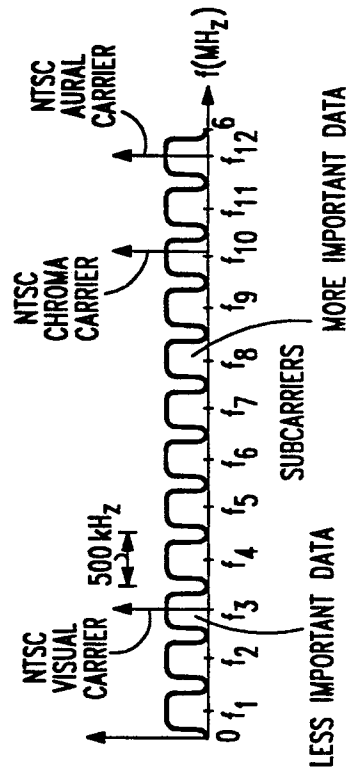
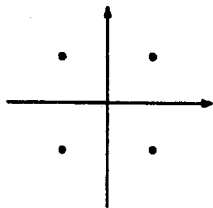


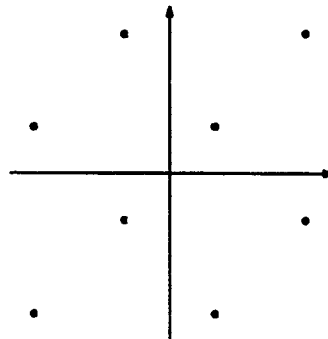
FIG. 4

FIG. 5



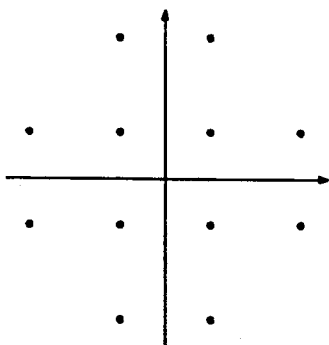
4 QAM SIGNAL CONSTELLATION

FIG. 6



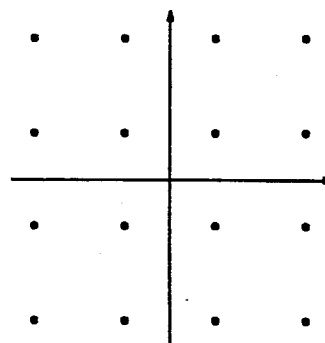
8 QAM SIGNAL CONSTELLATION

FIG. 7



12 QAM SIGNAL CONSTELLATION

FIG. 8



16 QAM SIGNAL CONSTELLATION

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.