



- [54] **CELLULAR TELEPHONE LOCATION SYSTEM**
- [75] Inventors: **Louise A. Stilp**, Broomall, Pa.; **Curtis A. Knight**, Washington, D.C.; **John C. Webber**, Herndon, Va.
- [73] Assignee: **Associated RT, Inc.**, Pittsburgh, Pa.
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- [51] Int. Cl.⁵ **G01S 1/24; G01S 3/02; H04M 11/00**
- [52] U.S. Cl. **342/387; 342/457; 379/58**
- [58] Field of Search **342/387, 457, 35; 379/58, 59, 60, 62; 364/449**

5,008,679	4/1991	Effland et al.	342/353
5,023,809	6/1991	Spackman et al.	364/516
5,023,900	6/1991	Taylor et al.	379/32
5,055,851	10/1991	Sheffer	342/457
5,095,500	3/1992	Taylor et al.	379/32
5,101,501	3/1992	Gilhousen et al.	455/33
5,126,748	6/1992	Ames et al.	342/353
5,128,623	7/1992	Gilmore	328/1
5,153,902	10/1992	Buhl et al.	379/60
5,166,694	11/1992	Russell et al.	342/457
5,208,756	5/1993	Song	364/449
5,218,618	6/1993	Sagey	342/457

FOREIGN PATENT DOCUMENTS

WO93/06685 9/1992 PCT Int'l Appl. .

OTHER PUBLICATIONS

Smith, William W., "Passive Location of Mobile Cellular Telephone Terminals," IEEE, 1991, pp. 221-225.

Primary Examiner—Gregory C. Issing
Attorney, Agent, or Firm—Woodcock Washburn Kurtz Mackiewicz & Norris

[56] References Cited

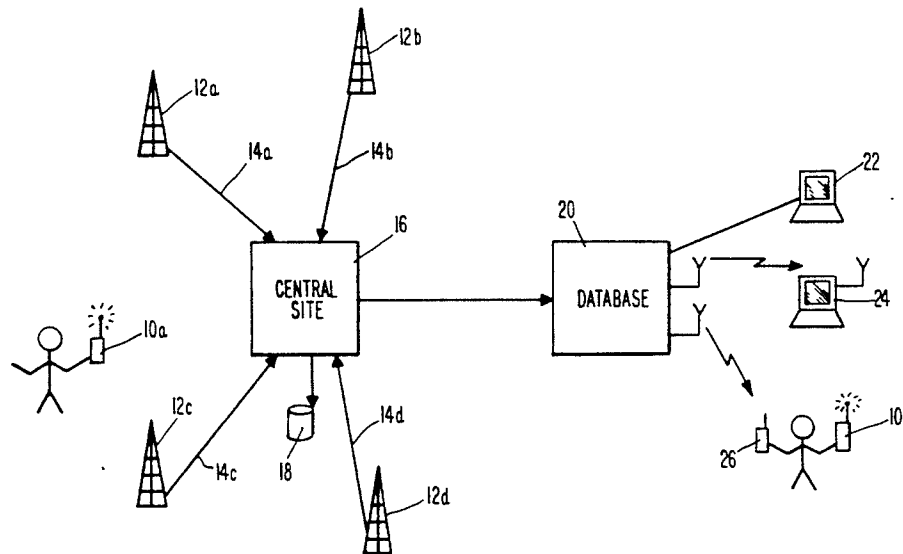
U.S. PATENT DOCUMENTS

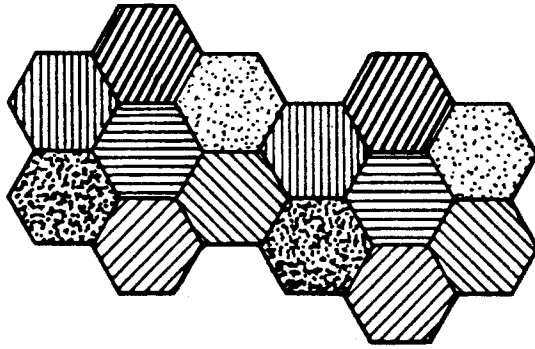
3,384,891	5/1968	Anderson	343/6.5
3,646,580	2/1972	Fuller et al.	342/457
3,680,121	7/1972	Anderson et al.	342/387
4,177,466	12/1979	Reagan	343/112 TC
4,297,701	10/1981	Henriques	343/6.5 LC
4,433,335	2/1984	Wind	343/463
4,596,988	6/1986	Wanka	343/457
4,638,321	1/1987	Drogin	342/444
4,639,733	1/1987	King et al.	342/424
4,651,156	3/1987	Martinez	342/457
4,651,157	3/1987	Gray et al.	342/457
4,728,959	3/1988	Maloney et al.	342/457
4,740,792	4/1988	Sagey et al.	342/457
4,742,357	5/1988	Rackley	342/463
4,791,572	12/1988	Green, III et al.	364/449
4,797,679	1/1989	Cusdin et al.	342/387
4,818,998	4/1989	Apsell et al.	342/44
4,870,422	9/1989	Counselman, III	342/357
4,888,593	12/1989	Friedman et al.	342/387
4,891,650	1/1990	Sheffer	342/457
4,908,629	3/1990	Apsell et al.	342/457
4,926,161	5/1990	Cupp	340/572
4,975,710	12/1990	Baghdady	342/442
5,003,317	3/1991	Gray et al.	342/457

[57] ABSTRACT

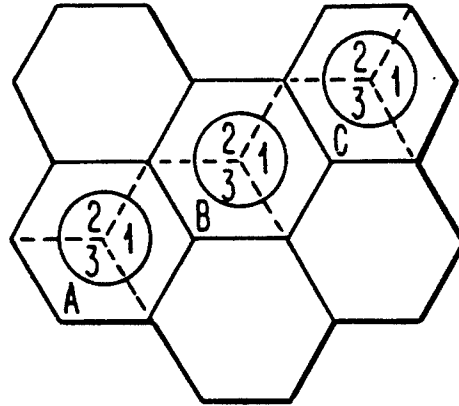
A cellular telephone location system for automatically recording the location of one or more mobile cellular telephones comprises three or more cell site systems 12. Each cell site system is located at a cell site of a cellular telephone system. Each cell site system includes an antenna that may be mounted on the same tower or building as the antenna employed by the cellular telephone system and equipment that may be housed in the equipment enclosure of the corresponding cell site. The cell site systems are coupled via T1 communication links 14 to a central site 16. The central site may be collocated with the cellular telephone system's MTSO. The central site 16 is further coupled to a database 20, which may be remotely located from the central site and made available to subscribers.

45 Claims, 15 Drawing Sheets

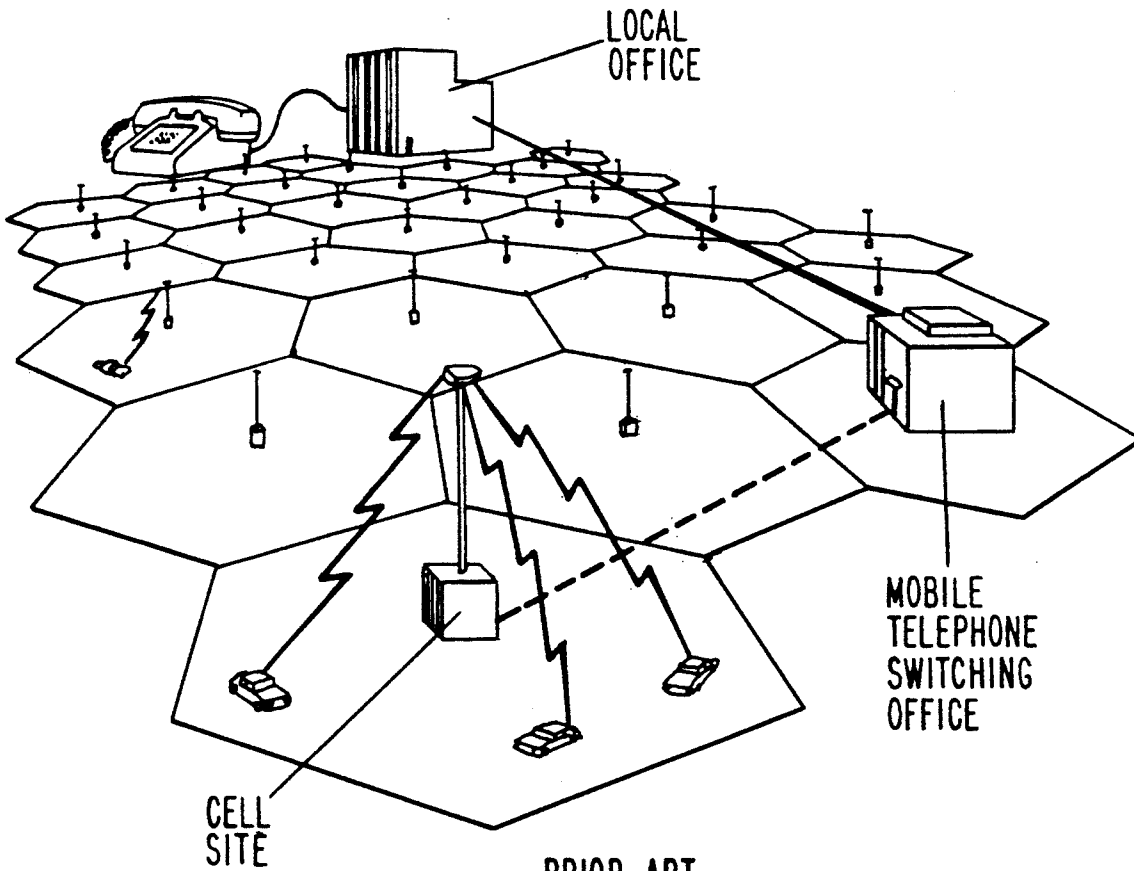




PRIOR ART
Fig. 1A



PRIOR ART
Fig. 1B



PRIOR ART
Fig. 1C

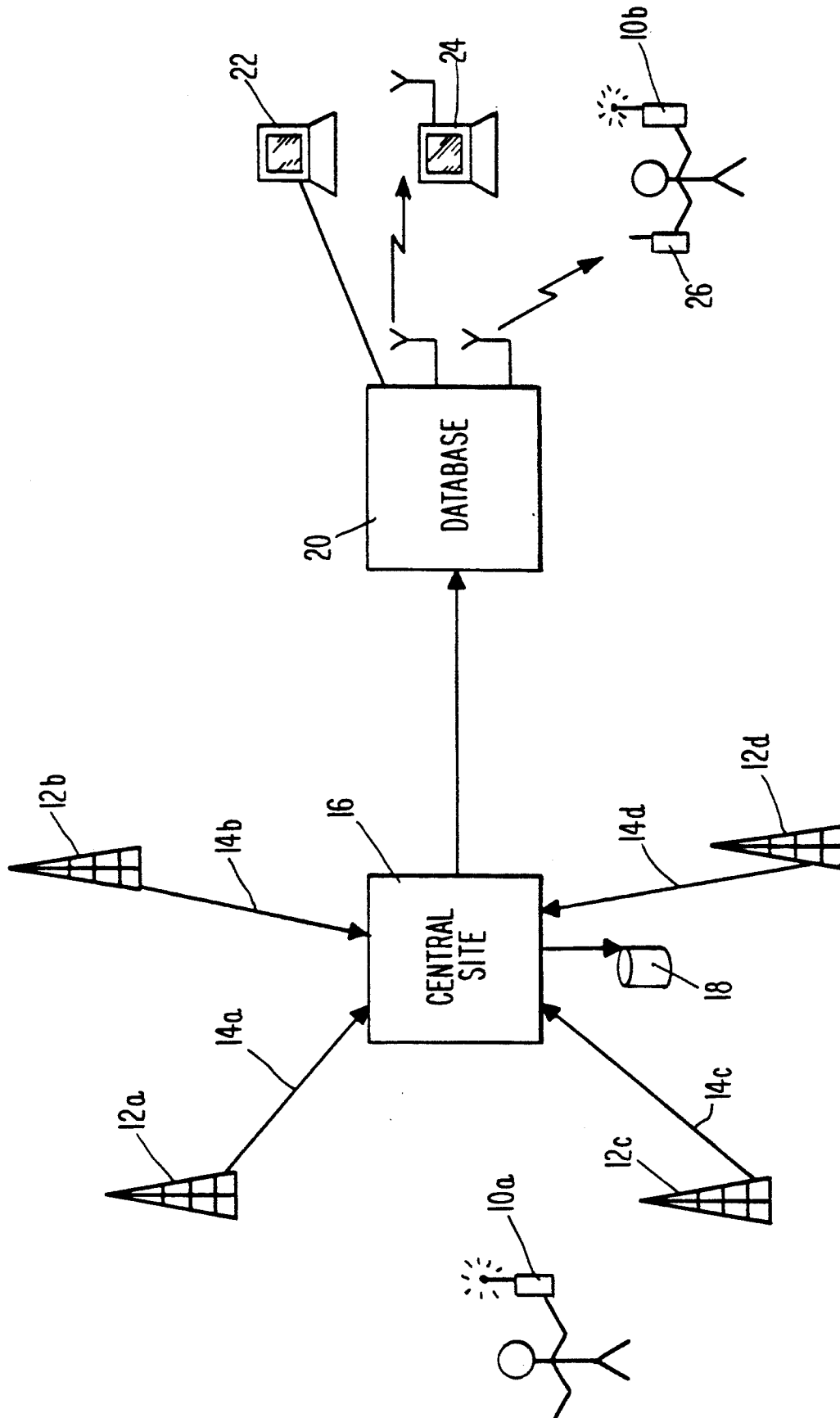


Fig. 2

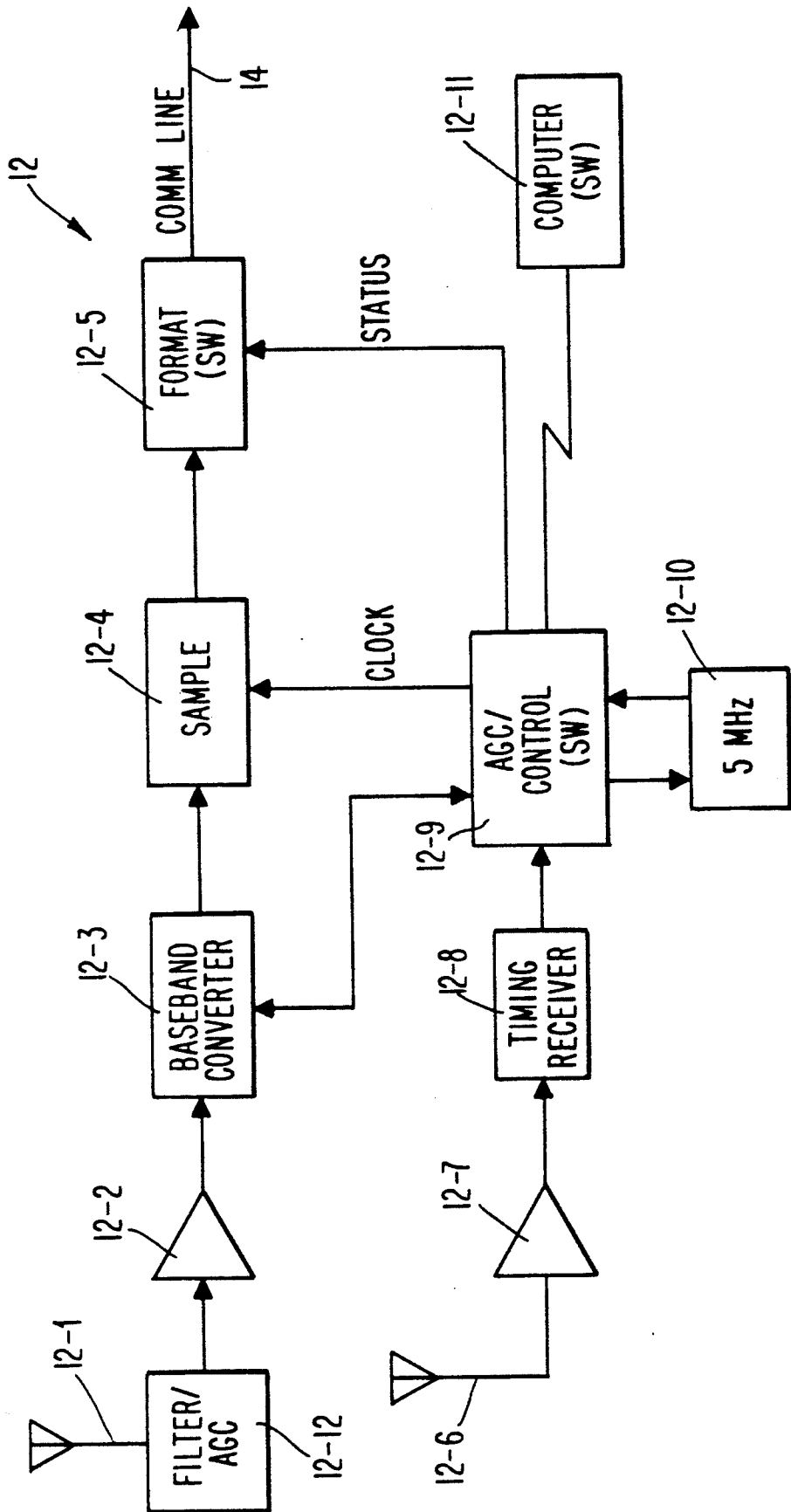
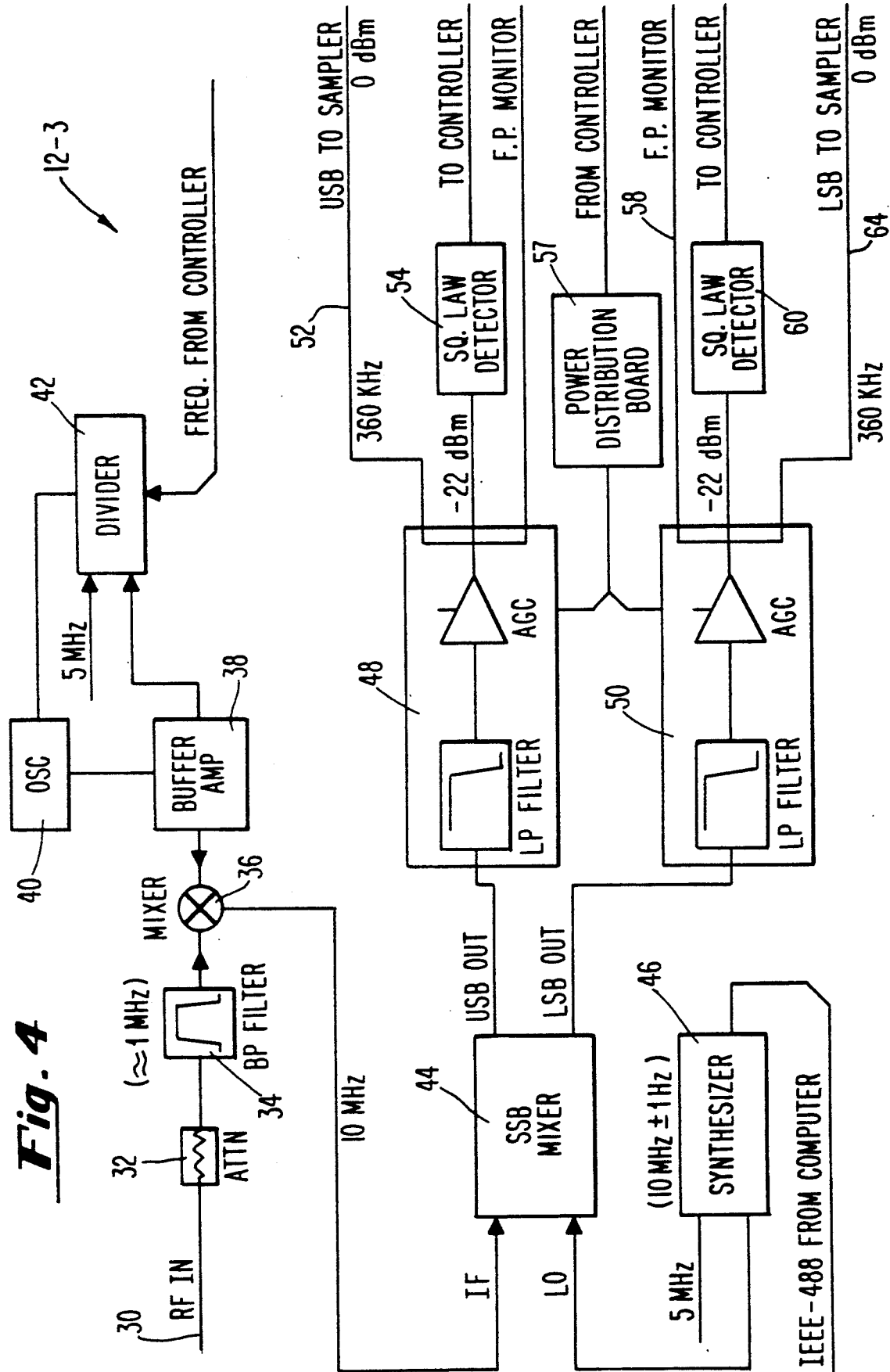


Fig. 3

Fig. 4



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