US005815505A

United States Patent [19]

Mills

[11] Patent Number: 5,815,505

[45] Date of Patent: Sep. 29, 1998

[54] **COMBINED ANALOG AND DIGITAL COMMUNICATIONS DEVICE**

[75] Inventor: **Andrew Mills**, Austin, Tex.

[73] Assignee: **Advanced Micro Devices, Inc.**, Sunnyvale, Calif.

[21] Appl. No.: **696,201**

[22] Filed: **Aug. 13, 1996**

[51] **Int. Cl.**[6] **H04Q 11/00**

[52] **U.S. Cl.** **370/522**; 370/264; 370/463; 379/399

[58] **Field of Search** 370/420, 522, 370/524, 465, 463, 264; 375/219, 220; 379/399

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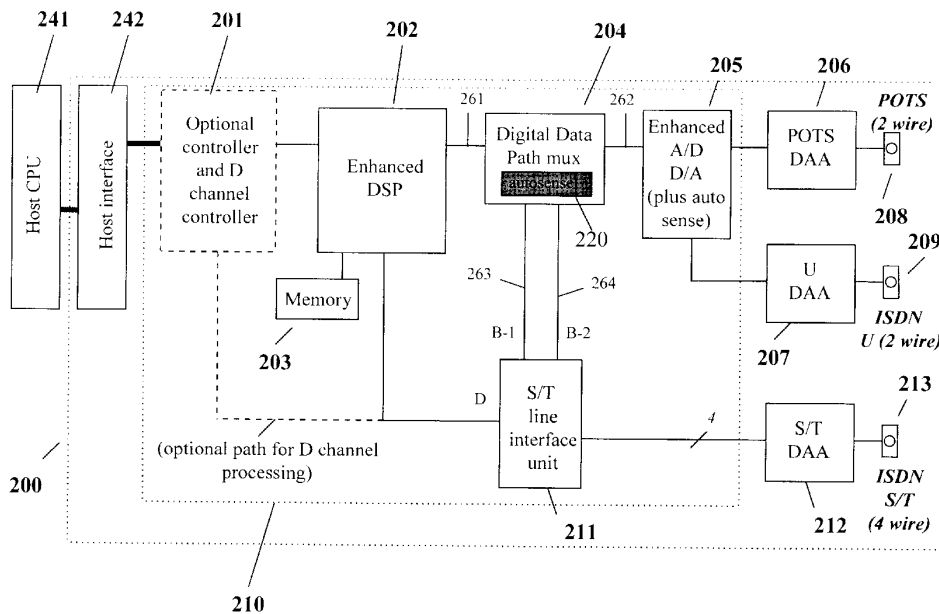|			
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Primary Examiner—Benedict V. Safourek
Assistant Examiner—Kenneth Vanderpuye
Attorney, Agent, or Firm—Conley, Rose & Tayon; Jeffrey C. Hood

[57] **ABSTRACT**

A communications device is presented which is configured to provide selective signal processing at a "plain old telephone service" (POTS) interface, an ISDN U interface, or an ISDN S/T interface. A first POTS connector allows the communications device to be connected to an analog POTS telephone line. A second ISDN U connector allows the communications device to be connected to an ISDN network at an ISDN U interface point. A third ISDN S/T connector allows the communications device to be connected to an ISDN network at an ISDN S/T interface point. A digital signal processing (DSP) core performs: (i) analog modem functions via analog modem emulation when a POTS telephone line is connected to the POTS connector, or (ii) ISDN digital voice and data processing functions along with ISDN S/T and U interface functions when an ISDN line is connected to the ISDN U connector, or (iii) ISDN digital voice and data processing functions along with ISDN S/T interface functions when an ISDN line is connected to the ISDN S/T connector. Interface logic couples signals between the DSP core and the connectors. A digital data path multiplexer coupled between the DSP core and the interface logic includes "autosense" logic which monitors signals received by the connector coupled to the telephone line and determines a data transfer mode based upon the received signals. The digital data path multiplexer provides the data transfer mode information to the DSP core, and the DSP core performs communications operations according to data transfer mode information.

29 Claims, 4 Drawing Sheets

Fig 1

Analog
Modem

16

POTS

18

xDSL
Communications
Device

40

42

xDSL

30

ISDN
Terminal Adapter
with Integral NT

32

31

BRI-ISDN

Public
Switched
Telephone
Network
(PSTN)

14

POTS

12

22

BRI-ISDN

23

U

ISDN
NT

26

28

S/T

ISDN
Phone

24

ISDN
Terminal Adapter

20

10

Analog
Modem

Fig 2 (Prior Art)

Fig 3

Fig 4

digital
data stream
to/from host
(e.g. audio, data,
voice, video)

transfer mode
(determined by
local or host
controller and/or
remote communications
device capability)

202

DSP based
digital
transfer
function

V class analog modem encoded for POTS
V class analog modem encoded for ISDN-U
V class analog modem encoded for ISDN-S
audio/voice coded for POTS
audio/voice coded for ISDN-U
audio/voice coded for ISDN-S
1B data stream encoded for ISDN-U (2B1Q)
2B bonded data stream encoded for ISDN-U (2B1Q)
...., etc

U activity, or
S activity, or
POTS activity, or
other line type

Line type
auto sense
function

302

DSP algorithm 1,
DSP algorithm 2,
DSP algorithm 3
etc, dependent on
which line type and
required data format

304

DOCKET ALARM
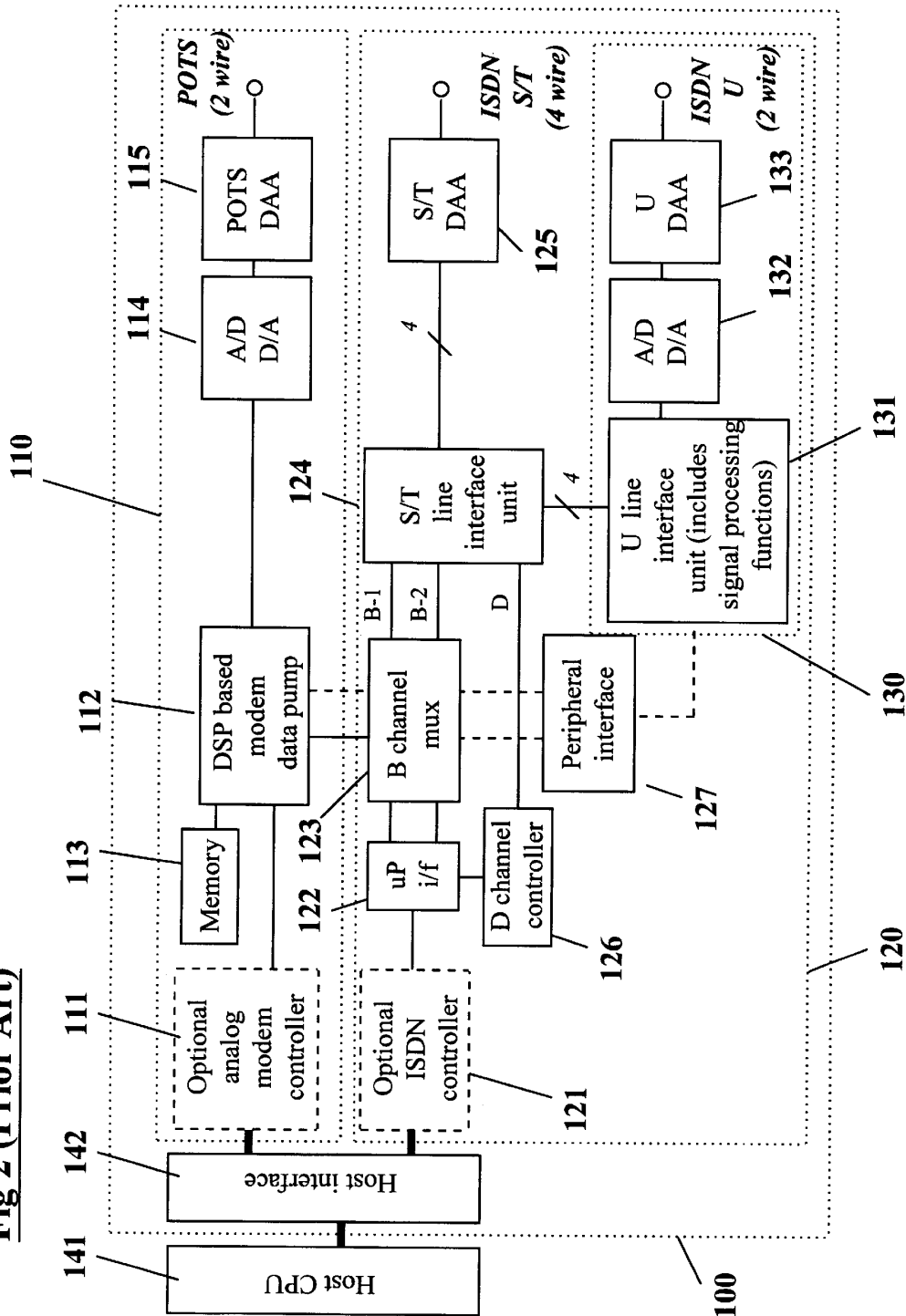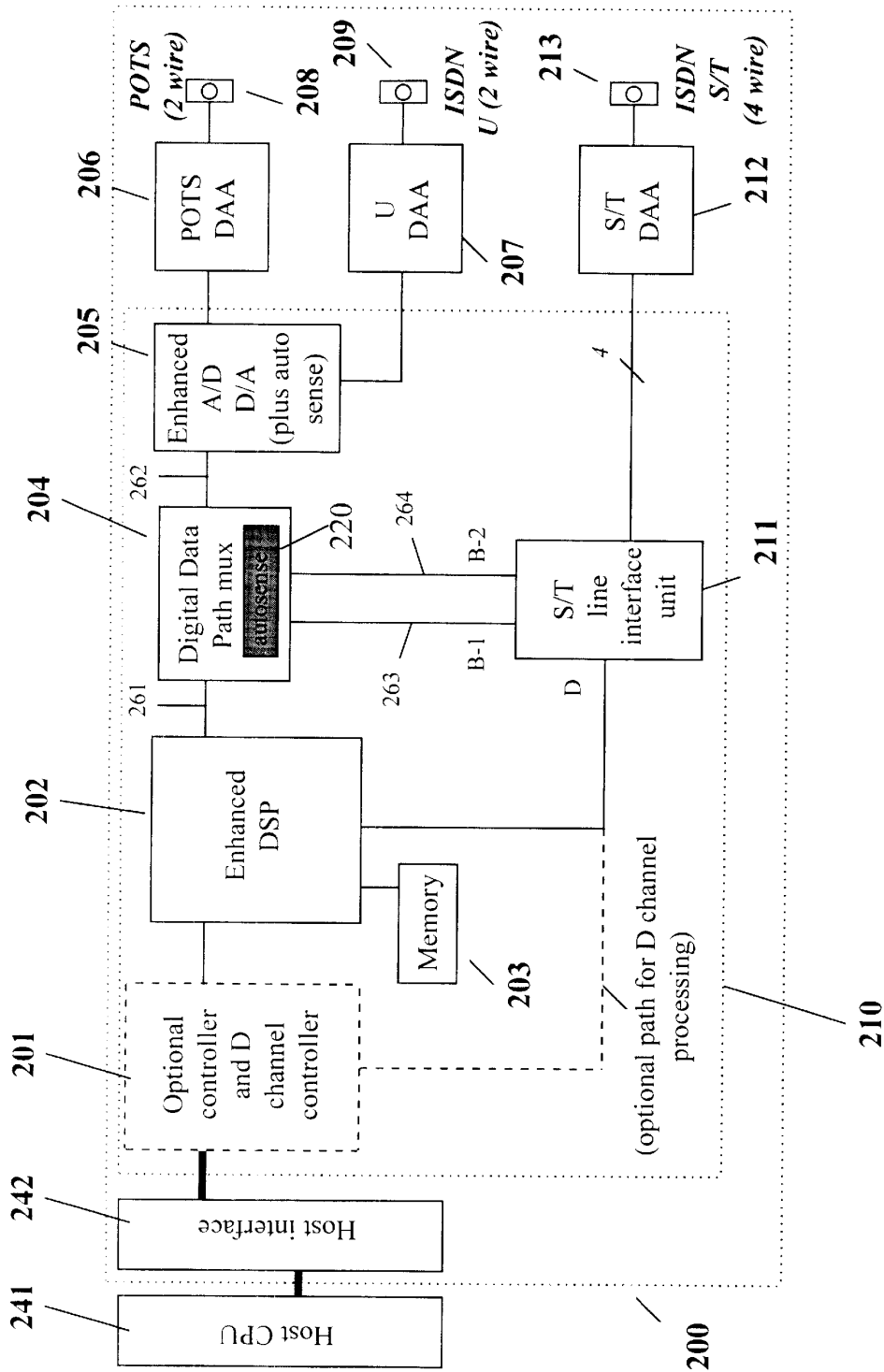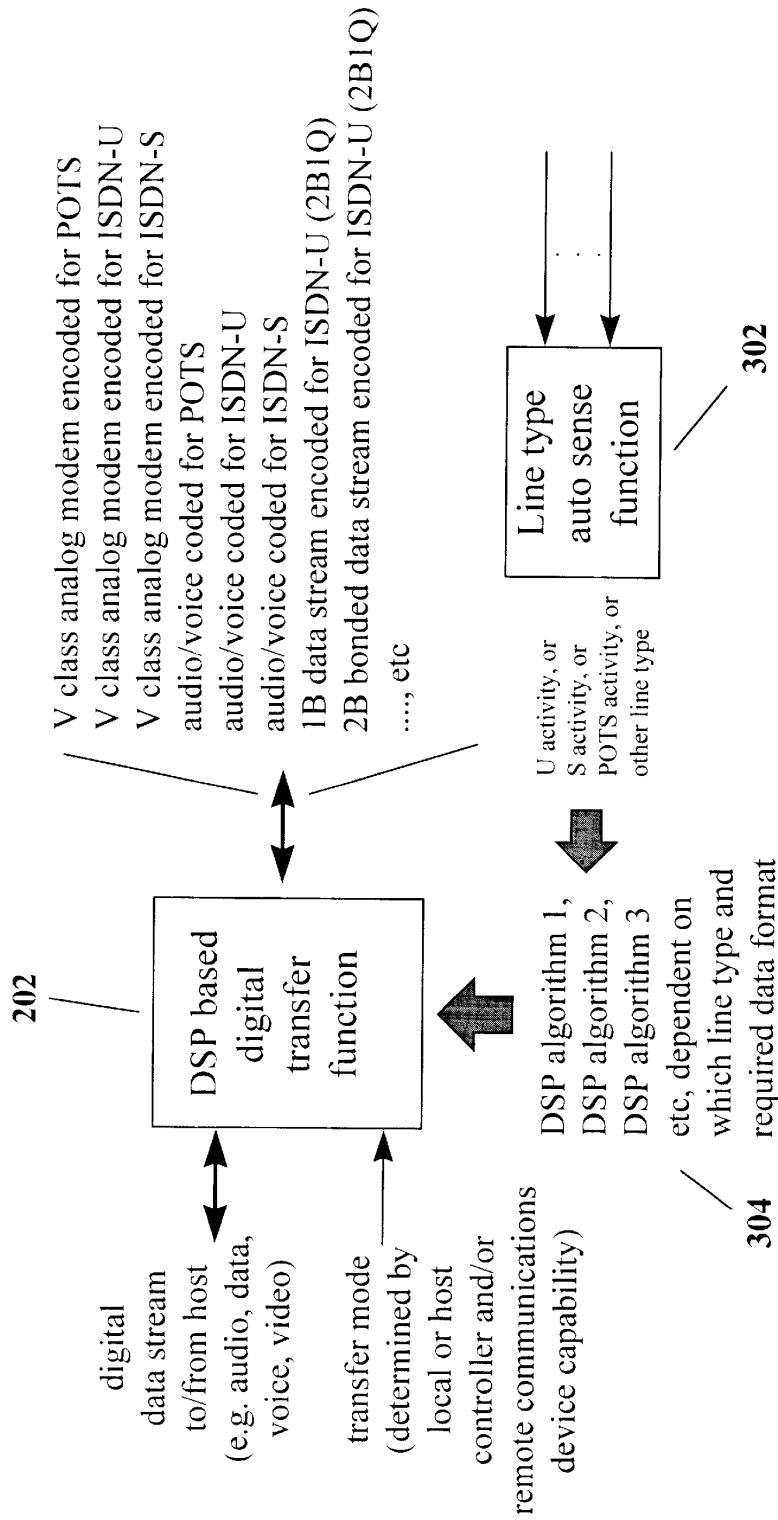
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