



Exemplary Mapping of US6987986 Patent Against ZTE Radiant™ Android Smartphone

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US Patent 6,987,986 – Cellular Telephone, Personal Digital Assistant With Dual Lines for Simultaneous Uses

Claim 10:

A handheld personal communications device capable of simultaneous communication across a first communication channel associated with a first antenna and a second communications channel associated with a second antenna, comprising:

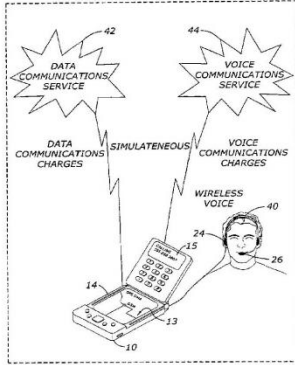
a housing;

the first antenna operatively connected to a radio transceiver disposed within the housing for operative voice communication across the first communications channel;

the second antenna for receiving GPS data over the second communications channel;

an intelligent control operatively connected to the radio transceiver and adapted to receive the GPS data; and

a display operatively connected to the intelligent control.

(12) United States Patent Boesen	(10) Patent No.: (45) Date of Patent:	US 6,987,986 B2 Jan. 17, 2006
(54) CELLULAR TELEPHONE, PERSONAL DIGITAL ASSISTANT WITH DUAL LINES FOR SIMULTANEOUS USES	6,094,492 A 7/2000 Boesen 6,167,039 A 12/2000 Karlsson 6,377,818 B2 * 4/2002 Inube et al. 455/556.1 6,418,326 B1 * 7/2002 Heinonen et al. 455/558 6,427,078 B1 * 7/2002 Wilska et al. 455/550.1 6,516,201 B2 * 2/2003 Kanbara et al. 455/551 6,633,759 B1 * 10/2003 Kobayashi 455/419 6,658,254 B1 * 12/2003 Purdy et al. 455/445 6,680,923 B1 1/2004 Leon 6,788,332 B1 * 9/2004 Cook 348/14.02	
(76) Inventor: Peter V. Boesen , 1000 73 rd St., Des Moines, IA (US) 50311		
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 780 days.		
(21) Appl. No.: 09/886,526	JP 10163939 A2 6/1998 JP 2000022670 A 1/2000	
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(51) Int. Cl. H04M 1/00 (2006.01)		
(52) U.S. Cl. 455/556.1; 455/557		
(58) Field of Classification Search 455/552.1, 455/553.1, 556.1, 556.2, 557 See application file for complete search history.		
(56) References Cited U.S. PATENT DOCUMENTS 4,682,180 A 7/1987 Gans 5,046,130 A * 9/1991 Hall et al. 455/78 5,422,934 A 6/1995 Massa 5,758,294 A 5/1998 Ganesan et al. 5,771,438 A 6/1998 Palermo et al. 5,894,595 A 4/1999 Foladare et al. 5,896,375 A * 4/1999 Dent et al. 370/347 5,898,908 A 4/1999 Griffin et al. 5,930,729 A 7/1999 Khamis et al. 5,983,073 A 11/1999 Ditzik 6,021,207 A 2/2000 Puthuff et al.		
	FOREIGN PATENT DOCUMENTS JP 10163939 A2 6/1998 JP 2000022670 A 1/2000	
	OTHER PUBLICATIONS Article entitled, "5th International Conference on Wearable Computers," by Rick Johnson, Pen Computing Magazine, Aug. 2000. Bell Labs, Wireless Research Laboratory, Internet pages printed on Jun. 26, 2000. * cited by examiner	
	Primary Examiner —Bing Q. Bui (74) Attorney, Agent, or Firm —McKees, Voorhees & Sease, P.L.C.	
	ABSTRACT The present invention includes a method and apparatus for a handheld personal communications device capable of simultaneous wireless voice communications service and wireless data communications service. The invention includes providing wireless voice communications service to a first line of a handheld personal communications device and simultaneously providing wireless data communications service to a second line of the handheld personal communications device.	
	12 Claims, 3 Drawing Sheets	
		

US Patent 6,987,986 – Patent Overview

- ▶ **Title:** Cellular Telephone, Personal Digital Assistant With Dual Lines for Simultaneous Uses
- ▶ **Priority Date:** June 21, 2001
- ▶ **Issue Date:** January 17, 2006
- ▶ This invention is useful for simultaneously talking on a cellular phone while accessing data, such as GPS data, over a wireless data communication service.
- ▶ **Specific Technical Domain of the Invention:** Simultaneous voice and data transmission in a handheld device

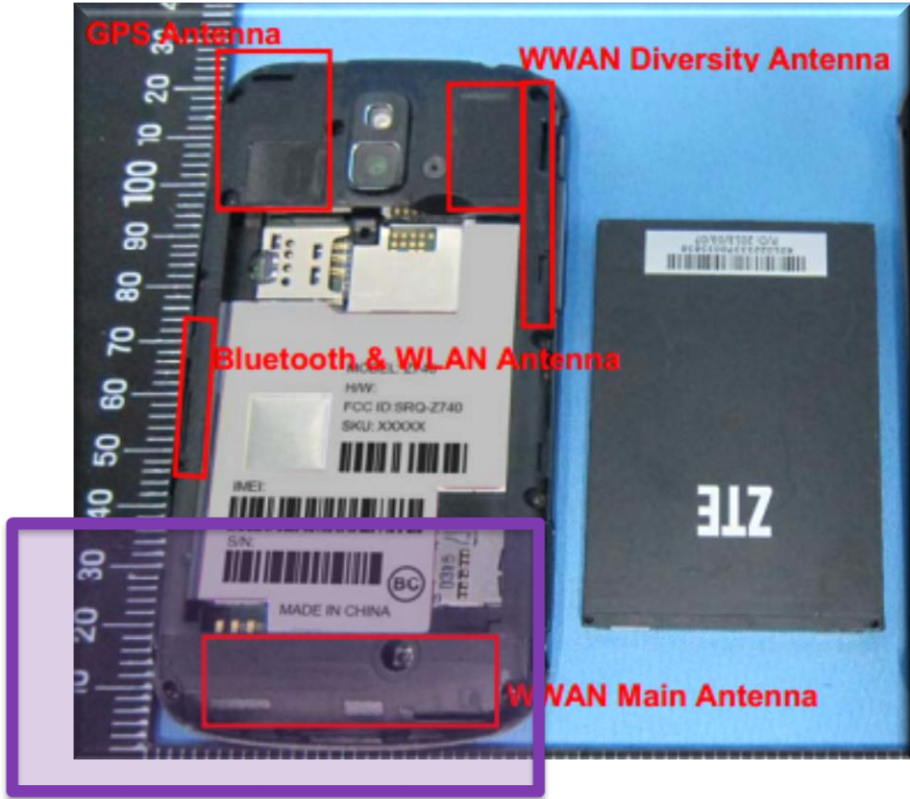
- ▶ **References:**
 - [R1]: <http://www.zteusa.com/att-radiant.html>
 - [R2]: http://www.phonescoop.com/phones/fcc_query.php?gc=SRQ&pc=-Z740
 - [R3]: <https://chipworks.secure.force.com/catalog/ProductDetails?sku=QUA-WTR1605L&viewState=DetailView&cartID=&g=>
 - [R4]: http://pdadb.net/index.php?m=specs&id=5713&c=zte_z740_radiant
 - [R5]: <http://techerablog.com/2014/03/02/snapdragon-system-on-chip/>
 - [R6]: <https://www.qualcomm.com/products/snapdragon/processors/s4-s1>

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>A handheld personal communications device capable of simultaneous communication across a first communication channel associated with a first antenna and a second communications channel associated with a second antenna, comprising:</p>	<div data-bbox="755 222 1095 786" data-label="Image"> </div> <div data-bbox="405 786 1449 996" data-label="Text"> <p>Enjoy simultaneous voice and data with ZTE Radiant™ an Android™ 4.1 smartphone with a 4" touchscreen, 5 MP camera and 720p video capture, Google™ integration, and tons of other apps for your day-to-day life. You can even customize your lock screen shortcuts for easy access to your most-used applications!</p> </div> <div data-bbox="1352 1035 1458 1063" data-label="Text"> <p>[Ref. R1]</p> </div>	<p>The ZTE Radiant is capable of simultaneous voice and data communication.</p>


Patent Spec. Reference [Col. 2, LI 1-5]: “The invention is an apparatus and method that provides for a handheld wireless communications device capable of simultaneous wireless voice communications and wireless data communications.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>A handheld personal communications device capable of simultaneous communication across a first communication channel associated with a first antenna and a second communications channel associated with a second antenna, comprising:</p>	 <p>[Ref. R2]</p>	<p>The ZTE Radiant makes use of the Main Antenna for voice communication.</p>


Patent Spec. Reference [Col. 3, LI 20-23]: “As shown, there is the first antenna 12 corresponding to a first line. The antenna 12 is electrically connected to a voice transceiver line one 16.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>A handheld personal communications device capable of simultaneous communication across a first communication channel associated with a first antenna and a second communications channel associated with a second antenna, comprising:</p>	 <p>[Ref. R2]</p>	<p>The ZTE Radiant makes use of the GPS Antenna to obtain GPS data.</p>




Patent Spec. Reference [Col. 3, LI 31-35]: “In addition, a second antenna 14 is used for line two. A data communications signal is received through the antenna 14 and sent to the data transceiver for line two 18. The data transceiver is then electrically connected to a modem 20.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
a housing;	 <p>[Ref. R2]</p>	The GPS and Main Antennas are placed inside the handset.

Patent Spec. Reference [Col. 3, LI 52-55]: “FIG. 3 illustrates a pictorial representation of the handheld personal communication device of the present invention in use. The handheld personal communication device 10 is shown.”


US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
the first antenna operatively connected to a radio transceiver disposed within the housing for operative voice communication across the first communications channel;	<div><p>[Ref. R2]</p><p>Qualcomm WTR1605L Publish Date: Nov-12 The Qualcomm WTR1605L is an LTE/HSPA+/CDMA2K/TDSCDMA/EDGE/GPS transceiver.</p><p>[Refs. R2, R3]</p></div>	The chip diagram shows the Main Antenna, which is connected with the Qualcomm LTE WTR16505L transceiver used for CDMA voice communication.

Patent Spec. Reference [Col. 3, LI 20-23]: “As shown, there is the first antenna 12 corresponding to a first line. The antenna 12 is electrically connected to a voice transceiver line one 16.”


[Col. 2, LI 50-51]: “A first antenna 12 is used for a first line for voice communications.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>the first antenna operatively connected to a radio transceiver disposed within the housing for operative voice communication across the first communications channel;</p>	 <p>[Ref. R2]</p>	<p>The chip diagram shows the Main Antenna, which is connected with the Qualcomm LTE WTR16505L transceiver used for CDMA voice communication.</p>

Patent Spec. Reference [Col. 3, LI 52-55]: “FIG. 3 illustrates a pictorial representation of the handheld personal communication device of the present invention in use. The handheld personal communication device 10 is shown.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>the second antenna for receiving GPS data over the second communications channel;</p>	 <p>[Ref. R2]</p>	<p>The GPS Antenna is particularly used for receiving GPS data using data communication.</p>

Patent Spec. Reference [Col. 3, LI 31-35]: “In addition, a second antenna 14 is used for line two. A data communications signal is received through the antenna 14 and sent to the data transceiver for line two 18. The data transceiver is then electrically connected to a modem 20.”

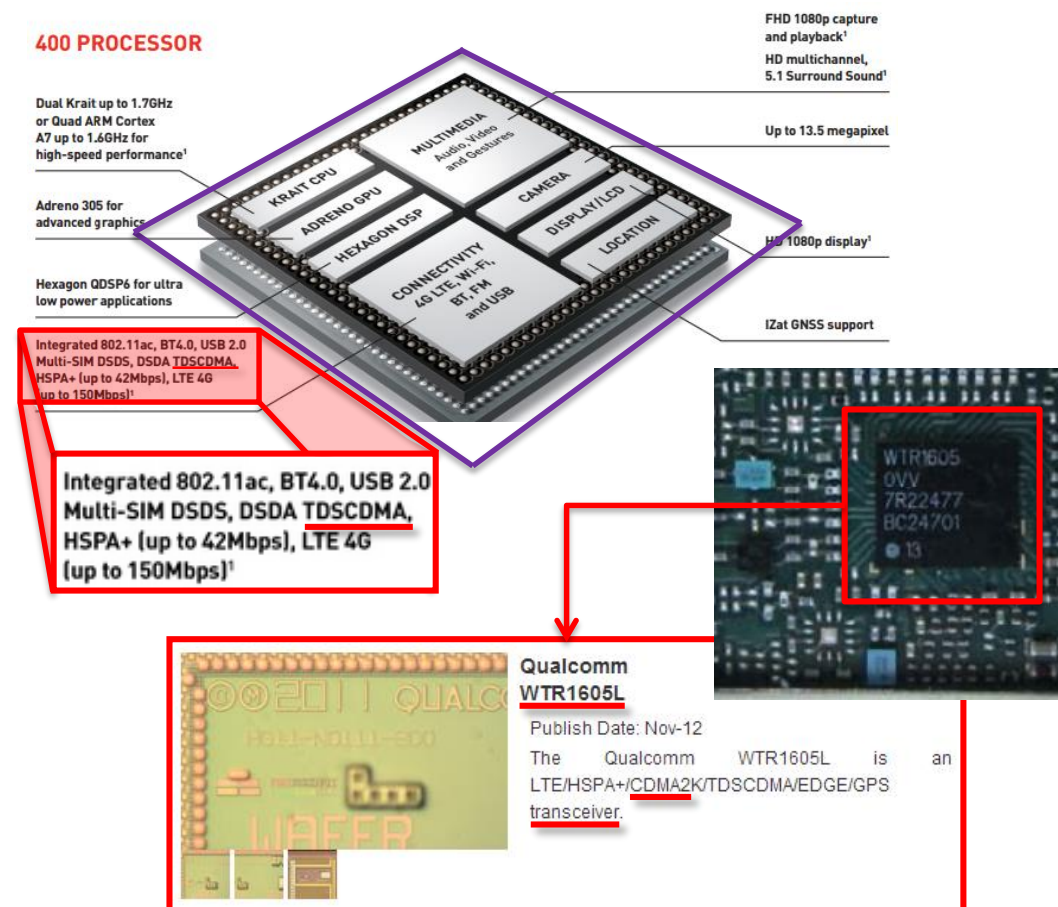
[Col. 2, LI 50-52]: “A first antenna 12 is used for a first line for voice communications while a second antenna 14 is used for wireless data communications.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>an intelligent control</p> <p>operatively connected to the radio transceiver and adapted to receive the GPS data; and</p>	<div><div>ZTE Z740 Radiant Specs</div><div><div><div>Datasheet Views:4960 views since addition of datasheet (January 30, 2014)</div><div>Datasheet State:Final specifications</div><div>Release Date:October, 2013</div><div>Dimensions:65.02 x 124.46 x 11.43 millimetres</div><div>Mass:147.4 grams (battery included)</div></div><div>Software Environment</div><div><div>Embedded Operating System:Google Android 4.1.2</div><div>Browse devices running this OS</div></div><div><div>Microprocessor, Chipset</div><div><div>CPU Clock:1400 MHz</div><div>CPU:Qualcomm Snapdragon 400 MSM8230</div><div>Browse devices based on this microprocessor</div></div></div></div><div><div>ZTE Z740 (AT&T Radiant)</div><div>October 31, 2013 at 3:15 pm by Ivan Andrianto</div><div><div>ZTE Z740 also known as AT&T Radiant</div><div>is an Android smarphone with 4.0-inch WVGA display, 1.4 GHz dual-core CPU, 1 GB RAM, and 2.03 GB built-in storage. Comes with Android 4.1 Jelly Bean out of the box, the device features a 5 MP camera with LED flash on the rear. It can record 720p video.</div></div></div><div>[Ref. R4]</div></div>	<p>The ZTE Radiant, also known as ZTE Z740, uses the Qualcomm Snapdragon™ 400 MSM8230 processor.</p>

Patent Spec. Reference [Col. 3, LI 23-29]: “The voice transceiver 16 is then electrically connected to an intelligent control 22. The intelligent control 22 may be a processor, a microprocessor, a microcontroller, a digital signal processor, an integrated circuit, a portion of an integrated circuit, a control circuit, or any of the above in combination with other control logic or other intelligent control.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
<p>an intelligent control</p> <p>operatively connected to the radio transceiver and adapted to receive the GPS data; and</p>	<div><p>400 PROCESSOR</p><p>Dual Krait up to 1.7GHz or Quad ARM Cortex A7 up to 1.6GHz for high-speed performance¹</p><p>Adreno 305 for advanced graphics</p><p>Hexagon QDSP6 for ultra low power applications</p><p>Integrated 802.11ac, BT4.0, USB 2.0 Multi-SIM DSDS, DSDA TDSCDMA, HSPA+ (up to 42Mbps), LTE 4G (up to 150Mbps)¹</p><p>Integrated 802.11ac, BT4.0, USB 2.0 Multi-SIM DSDS, DSDA TDSCDMA, HSPA+ (up to 42Mbps), LTE 4G (up to 150Mbps)¹</p><p>Qualcomm WTR1605L</p><p>Publish Date: Nov-12</p><p>The Qualcomm WTR1605L is an LTE/HSPA+/CDMA2K/TDSCDMA/EDGE/GPS transceiver.</p><p>[Refs. R5, R2, R3]</p></div> 	<p>As shown in the previous slide, the ZTE Radiant uses the Snapdragon 400 processor core which supports TDSCDMA. Also, since the Radiant motherboard houses the Qualcomm WTR1605L, which is a R/F Transceiver used for both voice and GPS data, hence, it can be inferred that the Qualcomm processor is connected to the radio transceiver.</p>

Patent Spec. Reference [Col. 3, LI 23-29]: “The voice transceiver 16 is then electrically connected to an intelligent control 22. The intelligent control 22 may be a processor, a microprocessor, a microcontroller, a digital signal processor, an integrated circuit, a portion of an integrated circuit, a control circuit, or any of the above in combination with other control logic or other intelligent control.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
an intelligent control operatively connected to the radio transceiver and adapted to receive the GPS data; and	<div><p>400 PROCESSOR</p><p>The diagram shows a top-down view of the Qualcomm Snapdragon 400 processor. A red box highlights the 'LOCATION' block. Other labeled blocks include: KRAIT CPU, ADRENO GPU, HEXAGON DSP, CONNECTIVITY (4G LTE, Wi-Fi, BT, FM, and USB), MULTIMEDIA (Audio, Video and Gestures), CAMERA, DISPLAY/LCD, and a separate 'LOCATION' block. Callouts provide technical specifications for several components.</p><p>Callouts:</p><ul style="list-style-type: none">Dual Krait up to 1.76GHz or Quad ARM Cortex A7 up to 1.66GHz for high-speed performance¹Adreno 305 for advanced graphicsHexagon QDSP6 for ultra low power applicationsIntegrated 802.11ac, BT4.0, USB 2.0 Multi-SIM DSDS, DSDA TDSCDMA, HSPA+ (up to 42Mbps), LTE 4G (up to 150Mbps)¹FHD 1080p capture and playback¹HD multichannel, 5.1 Surround Sound¹Up to 13.5 megapixelHD 1080p display¹IZat GNSS support<p>[Ref. R6]</p></div>	The Qualcomm Snapdragon™ 400 processor is capable of receiving GPS data.

Patent Spec. Reference [Col. 3, LI 23-29]: “The voice transceiver 16 is then electrically connected to an intelligent control 22. The intelligent control 22 may be a processor, a microprocessor, a microcontroller, a digital signal processor, an integrated circuit, a portion of an integrated circuit, a control circuit, or any of the above in combination with other control logic or other intelligent control.”

US6987986 – Technical Mapping of Claim 10

Claim Element	Evidence of Use: ZTE Radiant™	Comment
a display operatively connected to the intelligent control.	<div><p>400 PROCESSOR</p><p>Dual Krait up to 1.76GHz or Quad ARM Cortex A7 up to 1.6GHz for high-speed performance¹</p><p>Adreno 305 for advanced graphics</p><p>Hexagon QDSP6 for ultra low power applications</p><p>Integrated 802.11ac, BT4.0, USB 2.0 Multi-SIM DSOS, DSDA TDSCDMA, HSPA+ (up to 42Mbps), LTE 4G (up to 150Mbps)¹</p><p>MULTIMEDIA Audio, Video and Gestures</p><p>KRAIT CPU</p><p>ADRENO GPU</p><p>HEXAGON DSP</p><p>CONNECTIONITY 4G LTE, Wi-Fi, BT, FM and USB</p><p>CAMERA</p><p>DISPLAY/LCD</p><p>LOCATION</p><p>FHD 1080p capture and playback¹</p><p>HD multichannel, 5.1 Surround Sound¹</p><p>Up to 13.5 megapixel</p><p>HD 1080p display¹</p><p>IZat GNSS support</p><p>[Ref. R5]</p></div>	The Qualcomm Snapdragon™ 400 processor is capable of being connected to mobile phone displays, hence, it can be inferred that the ZTE Radiant display is connected with the Snapdragon 400 processor.

Patent Spec. Reference [Col. 3, LI 60-67]: “The device 10 also includes a display 13. The display may be used for displaying a visual representation of data received over the data communications line. For example, the display 13 can display portions of the wireless web. In addition, a display 13 can contain other PDA information and may also include such things as a visual representation of a key pad that, when the display is a touch sensitive display, may be used to initiate a call.”



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