TiVo

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TiVo is on the front edge of the latest home entertainment technologies and it's popularity is increasing very rapidly. TiVo provides the ability to watch commercial free television programs and record hours of near-DVD quality video from different sources. Running on an embedded Linux platform gives TiVo stability, reliability and expandability. The open source platform provides the end user with the ability to customize their system and helps keep TiVo affordable. At the heart of TiVo is an IBM PowerPC processor which interacts closely with various embedded computing technologies.

The TiVo is a PowerPC 403GCX based embedded system with MPEG hardware, a standard IDE hard disk and a custom TiVo ASIC (Application Specific Integrated Circuit). The PowerPC 403GCX 32-bit RISC embedded controller offers high performance and functional integration with low power consumption. It has a 16 KB instruction cache and an 8 KB write-back data cache. It also has individual programmable on-chip controllers for four DMA channels, and DRAM, SRAM and ROM banks. TiVo runs at a processor speed of 66 MHz. 403GCX includes power management features to maximize efficiency.

The MPEG hardware consists of a SONY CXD1922Q MPEG-II Video Encoder, IBM 39MPEG MPEG Audio/Video decoder, and a

Microclock MK2745-265 MPEG clock synthesizer. The most integral component of the MPEG hardware is the SONY MPEG-II Video Encoder. The chip is a highly-integrated device which includes MPEG-II encoding, motion estimation, and system and rate control. It supports NTSC and PAL systems with real-time encoding. It also supports lower-level MPEG encoding in order to minimize disk usage. Without such versatility, the TiVo system would never have gained so much popularity.

The TiVo Application Specific Integrated Circuit, a.k.a. TiVo "Mediaswitch" ASIC is proprietary to TiVo Inc. and no information about it's operation is available to the general public. Keeping the technical facts and figures under lock and key helps the company hold on to it's market share.

The TiVo comes with several different I/O ports including an RJ-11 connection, serial and infrared control outputs, component and S-Video inputs and outputs, and analog co-axial input and outputs. Several different on-board components handle the operations of these ports.

TiVo includes a standard IDE hard disk which can be upgraded depending on the users need. Running on this fixed storage device is a customized PowerPC Linux kernel which is available under the GPL (General Public License)

from www.TiVo.com/linux. The modules and the commands are also available for download from the same place.

The future of television has been altered forever because of the forthcoming of TiVo. The possibility of digital recording has dawned a new era of home entertainment. TiVo's combination of open source software and embedded hardware makes it a leading contender in this market.

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