Computers for Ham Radio

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- Discuss hardware/software choices
- Suggest some Computer Hardware.
- Discuss Ham Computer interfaces

Computer Configurations

- Most computers hardware built within the last 8 years are suitable for Ham Radio Application Software
- Software Operating System are:
  - DOS/Machine Language based - Not current technology, devoted controllers.
  - Windows – Wide choice of possibilities
    - Lowest cost most possibilities
  - Apple – Limited possibilities
    - Costs much higher, fewer choices
  - Linux – Choices wider than Apple but less than Windows.

Windows Based Systems

- Hardware comes in two flavors
  - Branded Hardware – Costs very competitive
    - Systems like HP, Dell, Sony …
      - Difficult to upgrade and repair
      - Motherboards, Power Supplies non standard sizes
      - Must purchase upgrade or replacements parts from manufacturer. Normally very expensive
      - If it fails and is old, best to just scrap it
  - OEM Hardware – Could cost more than a branded system
    - Built by local store or Home Brew
      - Easy to upgrade, parts available everywhere
      - Motherboards, Power supplies avaiable everywhere
      - Keep the enclosure and replace and upgrade parts

Non Windows Based System

- Apple hardware
  - Costs tend to be about 4 times more then a Windows based system (exact same CPU, IO and Hard Drives)
  - Choices limited to what manufacturer sells.
  - Hackintosh possible on PC hardware
- Linux hardware
  - Windows Hardware is compatible with Linux
  - If you stick with Intel Hardware (CPU and motherboard chip sets) most Linux distributions will Install.
  - Application software avaiable but choices less than Windows.

Some Hardware Recomendations

- Build your own, buy weekly special at Fry's
  - Look at Sac. Bee for Ad's.
  - Consider Intel CPU/Chip set motherboard ($100 to $400)
  - Buy a low cost enclosure at store.
- Buy reconditioned IBM Thinkcenter M52
  - About $180 with XP, $100 no OS on Ebay
    http://www-01.ibm.com/finder/businesscenter/us/en/certifiedpcequipment_topic.wss
  -
- Consider a Netbook Laptop – Small size, very portable
  - Problem has no RS/232 serial port (purchase usb to serial adapter)
  - I like Asus EEEpc Family - $50 (used old) to $450 latest and greatest

Hackentosh – Open Source Software and PC Parts – Cost about $320 Apple price

Mac Mini $1000 with less performance and smaller drive

Nvida Injector Software - http://nvinject.free.fr/downloads.php
http://nvinject.free.fr/files/Latest_NVinject.0.2.1_512Mb.zip

Empire EFI - http://prasys.co.cc/2009/10/empire-efi/
Download used - http://uploadpla.net/files/5106_fnuhx/EmpireEFI_V108_all-in-one.zip

Nvida 7300 GS Display Adapter - $24
http://www.newegg.com/Product/Product.aspx?Item=N82E16814143050&Tpk=nvida 7300

Gigabyte Motherboard – GIGABYTE GA-G41M-ES2L - $60
http://www.newegg.com/Product/Product.aspx?Item=N82E16813128388

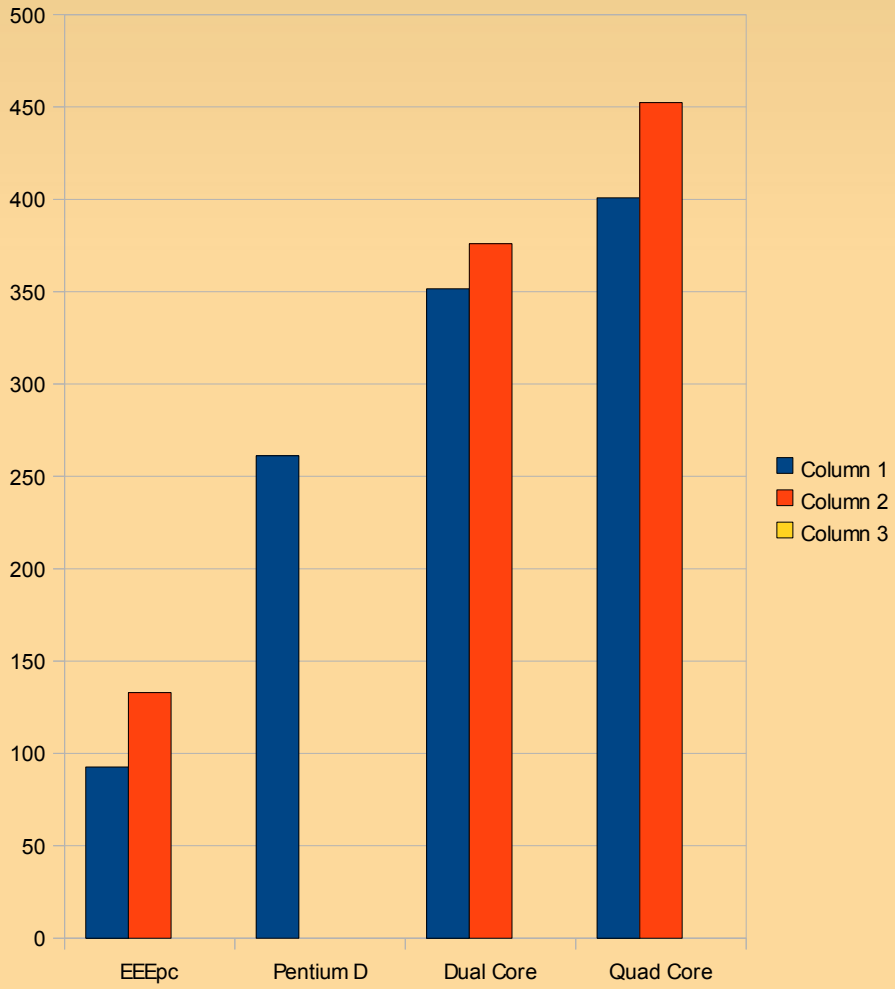
Apple Software – Snow leopard DVD - $29
http://store.apple.com/us/product/MC223Z/A?fnode=MTY1NDAzOA&mco=MTA4MjgwNDE

Sound Adapter - USB - $9.99
http://www.newegg.com/Product/Product.aspx?Item=N82E16812186046

Instructions to install a Apple KEXT File
http://grafikdesign.wordpress.com/2008/02/23/how-do-i-install-a-kext-file/

Instructions to install Empire EFI
http://www.hackintosh.com/

Hardware Benchmarks – SciMark V2



- **Relative performance of various PC systems**
- **SciMark is in Drystones and a benchmark of CPU performance**
- **XP requires about 125 and Win 7 about 225 to run adequately**
- **Linux runs will in 50 or more. Special distributions can run well with older hardware with < 50.**
- **To run Virtual Systems or many applications at the same time well a value of 300 or more is desirable**
- **Ham Radio applications will run fine with a value of 75 or more**
- **Raw data: http://sclh.no-ip.com/computers.html**

Ham Radio Computer Applications

- Data Communications
  - Packet or APRS – Serial Port
  - Data Communications – Audio Port
- Other Modes
  - Voip variants
  - Remote computer control - Ethernet
- Radios in the Future
  - Software Defined Receivers (SDR's)

Data Communication

- Ham Radio Equipment
  - Serial Interface (Packet and APRS)
    - Hardware analog signal demodulator (modem)
    - Computer decodes and displays data
  - USB, Audio and CAT interfaces
    - USB used for computer interface
    - Audio data converted to data then transferred to computer (External and Internal hardware)
    - CAT used to controls radio hardware (Unique serial interface to equipment)

Other Modes

- VOIP Communication
  - EchoLink – Internet to Radio Link
  - D-star – Icom mainly – Radio to Radio over Internet
  - IRLP – Repeater to Repeater over Internet
- Remote Equipment Control by ethernet
  - Glentech – Control your HR equipment over the Internet (RTE-FXO) $289 with Icom CI-V cable
  - Radio Remote Control 1258MkII – Sweden $259 US
  - Home brew OK1HAR http://ok1hra.nagano.cz/remoterig.html

Radio's in the Future

- Software Defined Radio Equipment
  - Radio radio components (mixer, filters, amps) completely in software. Computer interface is USB.
    - Initially concept described in ARRL Handbook 1999
    - RF Space Inc (Rcvr) SPR-IQ – QST Jan 2010, ($500)
    - Flex Radio's are top of the line (Transceivers) ($600 to $5000)
    - Kits available.
      - Genesis Radio Australia – (Trans) 40 mtr ($149)
      - Softrock WB5RVZ – Recv kits ($10 to $60)