Aviation Industry CBT Committee

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AICC

GUIDELINES and RECOMMENDATIONS

AGR 002
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VERSION 7.0

COURSEWARE DELIVERY STATIONS: HARDWARE
AICC PLATFORM COMMITTEE

SCOPE

This document contains recommendations for the acquisition of Computer Based Training (CBT) student delivery systems, also referred to as the "platform." The platform includes computer, monitor, operating system, and peripheral devices. This AGR contains hardware-related recommendations; while software-related recommendations are contained in AGR004, *Courseware Delivery Stations: Software*. The objective of the recommendations is to enable an airline to assemble a training delivery system with the ability to deliver the widest range of aviation CBT courseware. During development of the recommendations, the AICC kept the following in mind:

1. Flexibility

   The platform recommendations are designed to allow changes that may be necessary to run alternative courseware, as well as customized installation options.

2. Expandability

   The recommendations are designed to allow future hardware upgrading at minimal cost.

3. Changing Technologies

   The computers used in today's CBT are part of a rapidly evolving market. What is "mainstream" today was "trend setting" yesterday and will be "behind the times" tomorrow. More and more of our students are acquiring computers for their homes and demand comparable systems for their training. It is the desire of AICC to suggest a platform that will run all of today's software as well as look forward to the future.

   The AICC is committed to reviewing and evaluating emerging technologies as appropriate to the enhancement of CBT. The recommendations are therefore periodically updated and reissued.

4. Fiscally Responsible

   The recommendations try to stay in the mainstream of computing power. With an obsolescence factor of 3-5 years, the recommendations attempt to extend the hardware investment as long as possible.

The AICC recognizes that the first consideration for any CBT platform is that it run the courseware for which it is purchased. Thus it is often the recommendation of the Courseware vendor that carries the most weight in the purchasing decision. However, once into CBT, most companies will grow in their usage of it. Often this means purchasing courseware from more than one vendor. The recommendations presented in this AGR are to help an organization purchase equipment that can grow into the future.

Purchasing a computer to run both Windows and DOS courseware can be very difficult. Please contact the vendor of your DOS based courseware for guidance on additional hardware that may be required.

This document and earlier versions are available on the AICC Internet Web Site (www.aicc.org).

Caveats...
Review Cycle

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Current Courseware

This platform will meet the needs of most current Windows based courseware. The hardware is currently available and is considered "mainstream" and cost effective.

Intel Pentium 200 MHz MMX CPU (or faster)	R.1
64M RAM	R.2
3 ½" 1.44M Floppy	
Keyboard	
Mouse	
20" Multisync Monitor	R.3
PCI Video (2M expandable to 4M)	R.4
Local Hard Drive	R.5
Sound Card (16bit or better)	R.6
Windows 95	R.7
CD ROM (16x or faster)	R.8
Options:	
PCI Network Card (10/100Mb)	R.9

Future Courseware

This platform will meet the needs of current Windows based courseware as well as courseware currently in development for future delivery. The hardware is currently available, and although it is considered high end now, the purchasing investment will carry further into the future.

Intel Pentium II 300 MHz MMX CPU (or faster)	R.1
64M RAM (or more)	R.2
3 ½" 1.44M Floppy	
Keyboard	
Mouse	
20" Multisync Monitor	R.3
PCI Video (4 Meg or more)	R.4
Local Hard Drive	R.5
Sound Card (32bit or better)	R.6
Windows 9X/NT	R.7
CD ROM (24x or faster)	R.8
Options:	
PCI Network Card (10/100Mb)	R.9
Hi-Density Removable R/W Device	R10

The platform you choose should match your anticipated business model. During the next 3-5 years, if you will be deploying only currently existing courseware, choose the first platform. If you are anticipating adding courseware being developed today and in the near future, choose the second platform.

R.1   INTEL PENTIUM 200 MHz MMX CENTRAL PROCESSOR UNIT (CPU)

RATIONALE:
- Windows Based System require higher horsepower than DOS Based Systems. This CPU is currently mainstream.
- Current evolution in CBT courseware is toward using 3D graphics, real-time simulation, and multimedia. These require a faster CPU for smooth operation.

NOTE:
- A Pentium II 300MHz MMX CPU will provide for future courseware and thus will be a better long term investment.
- The end user should consider the recommended CPU as a minimum. When acquiring new computers, purchasing at the high end of available processing power will help to keep up with rapidly changing technology and the associated high rate of hardware obsolescence.

R.2   A MINIMUM OF 64MB COMPUTER MEMORY AND HAVING CAPABILITY OF FURTHER EXPANSION

RATIONALE:
- While the Windows 95 environment will run with at least 8MB, a significant improvement in speed is attained with 64MB or more.
- The latest courseware, because of sophisticated interactions, high resolution graphics, 256 and more colors, complex simulations, digitized audio and video requires more memory.
- Current memory costs are at an all time low. Future software and courseware is anticipated to use even more memory.

R.3   A NON-INTERLACED MULTISYNC MONITOR WITH 31-64 KHZ HORIZONTAL SCAN RATE AND 75 HZ VERTICAL SYNC RATE WITH A SCREEN SIZE OF APPROXIMATELY 20" DIAGONAL AT THE RESOLUTION SPECIFIED IN R.4

RATIONALE:
- Multisync monitors are today's industry standard and allow running of most available CBT applications.
- The range of frequency is satisfactory to AICC participants.
- Many (not all) viewers perceive flickering in an interlaced display. Perceived flicker is distracting. Non-perceived flicker can also have subliminal effects on viewers, ranging from headaches to eyestrain.

NOTE:
- Financial considerations may prompt the buyer to look at smaller screen sizes. A 17" monitor is a cost effective compromise as long as the scan rates are the same.
- Selection of smaller size monitors or a lower scan rate involves a trade-off between density of information, cost, and student comfort.
- There may be touch screen considerations for DOS courseware.

R.4   A PCI VIDEO CARD CAPABLE OF 1024 BY 768 GRAPHICS RESOLUTION WITH 65K COLORS (2M MEMORY)

RATIONALE:
- This resolution allows the use of enough colors to adequately display graphics and video.
- Supported by many vendors with a large variety of hardware.
- 17" and larger monitors support this resolution.

NOTE:
- New multimedia applications and the advent of DVD drives will bring more MPEG video into courseware. A video card with hardware MPEG playback will become more common and necessary to the training function.
- While 2MB of memory is minimal, more memory may be needed for specific applications and will extend the life of the video card.
- Not all video cards operate equally, therefore, be sure to test the video card with your courseware.
- Some legacy courseware may not run with these boards. Consult your CBT vendor.
- True Color cards may cause problems with DOS based CBT which uses Palletized color, however, they have considerably more color depth in Windows applications.

R.5   A LOCAL HARD DRIVE

RATIONALE:
- Networked systems may require no more than a low capacity hard drive for system files.
- Stand alone systems will require a hard drive sized to courseware requirements and system files.
- Windows Swap Files operate better on a local hard drive.

R.6   A MPC II 16 BIT SOUND CARD

RATIONALE:
- Industry standard for Windows Based sound.

NOTE:
- As more multimedia is placed into courseware, the audio requirements increase. A 32 bit sound card is likely to be required in the very near future and may be a better investment.
- Please refer to AICC white paper MPD005 regarding AICC audio migration.

R.7   MS WINDOWS 95 AND APPLICABLE COMPONENT DRIVERS

NOTE:
- See AGR-004 for operating systems rationale.

R.8   IF A CD ROM IS REQUIRED, MPC II COMPLIANT WITH 16X SPEED

RATIONALE:
- This is the required for retrieving audio/video files without gaps in the playback.
- MPC II is an tested industry standard.

NOTE:
- With more multimedia appearing in courseware, the faster 24X speed drives will improve playback of video, especially MPEG.

R.9   IF NETWORKING, A PCI NETWORK CARD CAPABLE OF 10MB/s AND 100 MB/s

RATIONALE:
- Multimedia courseware puts a tremendous amount of traffic on the wire. A 10MB/s card is minimum and is currently in place in many network installations. However, when planning for the future, 100MB/s should be implemented. Many network cards are currently available that support both speeds.
- A PCI card should be used as future computers may have no ISA slots.
- Refer to AGR-004 for further considerations.

R.10   FOR SOME STANDALONE COMPUTERS, A HIGH DENSITY REMOVABLE R/W DEVICE MAY BE NEEDED

RATIONALE:
- In some cases, such as internal company courseware, it may be more economical to deploy on media other than CD ROM. Several devices on the market today feature removable media with large storage capacities, such as LS120 Floppy Drive, Iomega Zip and Jazz Drives, or SyQuest SparQ.

GENERAL NOTES AND CONSIDERATIONS:
- PCI systems typically have 3 or 4 PCI slots and 3 or 4 ISA slots. Before deciding on this architecture, be sure the complement of add-on cards to be installed, will fit in this configuration.
- Please refer to AICC white paper MPD005 regarding AICC audio migration.
- A port configuration of 2 RS232C Serial (in addition to the mouse port) and 1 parallel is most common and will facilitate the potential attachment of add-on training equipment.
- If Digital Video is required, refer to AGR-008 for considerations.
- Any windows compatible x-y pointing device may be used instead of a mouse, such as monitor touch panel, trackball, touch pad, etc.
- Standard QWERTY keyboard.