



Aviation  
Industry  
CBT  
Committee

# AICC GUIDELINES and RECOMMENDATIONS

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## COURSEWARE DELIVERY STATIONS: SOFTWARE AICC OPERATING SYSTEMS AND NETWORKING SUBCOMMITTEE

### SCOPE

This document describes recommendations for the acquisition of Computer-Based Training (CBT) student delivery system software. The training delivery system is also referred to as the platform in this document. The platform includes the computer or PC, monitor, operating system, and peripheral devices. This AGR describes software-related recommendations. Hardware-related recommendations are detailed in **AGR002, COURSEWARE DELIVERY STATIONS: HARDWARE**. The objective of these recommendations is to enable an airline to assemble a training delivery system with the ability to deliver the widest range of currently available aviation CBT courseware. At the same time, these recommendations consider four other factors:

#### 1. Flexibility

The system recommendations are designed to allow changes that may be necessary to run alternative courseware. Additionally, there may be some changes desired by the user to customize installation. Networking, for instance, may be a desirable option for some airlines who acquire courseware designed for stand-alone operation.

#### 2. Expandability

Future courseware requiring upgraded hardware or software systems has also been considered in these recommendations. The recommendations are designed to allow upgrading at minimal cost.

#### 3. Changing Technologies

The AICC will continually review and evaluate emerging technologies as appropriate to the potential enhancement of CBT. These recommendations will therefore be periodically updated and re-issued.

#### 4. Certification Testing

The AICC has contracted with an Independent Test Lab to test and certify that aviation industry CBT courseware runs properly on any courseware delivery station which conforms to these guidelines and recommendations. Copies of complete certification tests are available from the AICC upon request

*Caveats...  
Review Cycle*

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## WINDOWS Based Courseware

### R.1 COURSEWARE DEVELOPMENT STARTED AFTER APRIL 1996 TO BE A MICROSOFT WINDOWS APPLICATION RUNNING UNDER MICROSOFT WINDOWS 95.

#### RATIONALE:

- Compatibility

Windows is based on the DOS platform which dominates airline CBT delivery systems. The large number of existing DOS applications and CBT written for the DOS environment will run on a Windows 95.

Most Windows 3.x applications and CBT run unchanged on Windows 95.

- Alternative analysis

The previous AICC recommendation was Microsoft Windows 3.x.

The following operating systems were reviewed:

- MS-DOS and MS-Windows version 3.x
- MS-DOS and MS-Windows (3.0) and HP New Wave
- OS-2 version 2 and Presentation Manager
- AIX with X-Windows and Motif
- Macintosh system 6.0.5 with Multifinder

- User interface

It has become obvious that a graphical user interface is critical to the success of any future operating system. This type of interface (with windowing and a pointing device like a mouse) have become accepted industry-wide.

- Industry standard

The Microsoft Windows environment has the fastest growing user base of any graphic interface in use today. It also has one of the largest number of current users of any graphic interface.

- Application proliferation

There are more applications and a larger variety of applications for the Windows environment than there are for any other GUI (Graphical User Interface). The variety of applications includes a number of CBT authoring systems. The number of new applications is growing faster than for any other GUI.

- Feature rich

Windows offers a large number of features that will be needed in future CBT programs. Multitasking windowing, networking, object orientation, and application linking are or will be supported in the Windows environment.

- Configuration independence

When courseware is designed to run in the Windows environment, many hardware configuration problems are eliminated. It no longer becomes critical that the platform have, for example, a Paradise VGA clone board instead of a Tecmar graphics adapter. It is not important whether the airline has a Logitech mouse or a Microsoft mouse. All that is required is that Windows be loaded.

Windows even provides a degree of resolution independence. The 640 x 480 program can easily be delivered on a 1024 x 768 or 1280 x 1024 system - if it runs in Windows. (The opposite is more problematical. Although 1280 x 1024 programs will run on a 640 x 480 Windows platform, what it will look like is an issue).

- Software evolution

Microsoft has committed itself to a continual series of upgrades which will guarantee that Windows will not become technologically obsolete.

Future versions of Windows will support the writing and running of 32 bit programs.

These programs will offer enhanced performance over current 16 bit programs even when running on the current generation of Intel machines (80386, 80486 and Pentium computers).

- Software migration

There are a number of tools on the market that are designed to make the migration from DOS to the Windows environment relatively simple. However, we are currently unaware of any that will make the job painless. Software migration from DOS to Windows is still challenging and difficult.

- Well-supported

Windows is sold and supported by Microsoft. Microsoft has a world-wide network for sales and support of its products.

- Networking

The following networking hardware and software evolution and compatibility with MS-Windows has been taken into account:

- Multi-protocol network interface
- Netware version 3.11 or newer operating system

- Multimedia

Multimedia extensions for MS-Windows (MPC II standard with MCI interface) are available at low cost from many suppliers.

## **R.2 EXISTING DOS COURSEWARE, IF NOT CONVERTED TO MICROSOFT WINDOWS APPLICATION, TO BE MADE TO RUN AS A FULL SCREEN DOS APPLICATION UNDER MICROSOFT WINDOWS 95.**

### **RATIONALE:**

- Refer to R.1 rationale.



**R.3 MICROSOFT WINDOWS 95 AND APPLICABLE COMPONENT DRIVERS.**

**RATIONALE:**

- DOS versions prior to 5.0 are either no longer supported by Microsoft or incompatible with some existing courseware.
- If purchasing a new computer, the user should use the current Microsoft DOS version. If outfitting an existing computer for CBT, all DOS courseware should run on DOS 5.0, but the courseware vendor will be the final authority.
- Windows 3.11 is the current available version. All device drivers must be compatible with this version.

**R.4 ALL PLATFORM COMPONENTS MUST SUPPORT MS WINDOWS 95 AND THAT MS WINDOWS 95 DEVICE DRIVERS BE AVAILABLE.**

**RATIONALE:**

- Windows 3.x compatibility offers a wide selection of interchangeable hardware options.

**R.5 FOR THE DOS ENVIRONMENT, AICC-COMPLIANT DRIVERS (as specified in AGR005, CBT PERIPHERAL DEVICES) TO CONTROL MULTIMEDIA PERIPHERALS SUCH AS MOUSE, VIDEO DISK READER, OVERLAY CARD. FOR AUDIO IN THE DOS ENVIRONMENT, AICC-COMPLIANT AUDIO DRIVERS (as specified in AGR003, DIGITAL AUDIO).**

**RATIONALE:**

- This interface has been standardized by the IMA (Interactive Multimedia Association) recommendations and the AICC recommendations for the DOS environment. The corresponding software drivers are provided by the hardware manufacturer or CBT system vendor.

**R.6 FOR WINDOWS ENVIRONMENT, MICROSOFT MCI (Multimedia Control Interface) DRIVERS TO CONTROL MULTIMEDIA PERIPHERALS SUCH AS AUDIO CARD, VIDEO DISK READER, OVERLAY CARD, DIGITAL VIDEO, CD-ROM READER.**

**RATIONALE:**

- This interface is standardized in the Microsoft Windows environment. The corresponding software drivers are provided by the hardware manufacturer.



**R.7 USE OF CGM FILES FOR THE INTERCHANGE OF VECTOR GRAPHIC INFORMATION. TRAINING DEVELOPMENT SYSTEMS SHOULD HAVE THE ABILITY TO IMPORT AND EXPORT GRAPHIC FILES IN THE CGM FORMAT.**

**RATIONALE:**

- CGM is a widely accepted and supported standard; format is defined by both ANSI and ISO.
- CGM is the ATA Spec 2100, 100, and 104 choice for graphics interchange.
- It is essentially device-independent and resolution-independent.
- It allows large, complex drawings to be stored in highly compact files, smaller than those created by other graphic formats.
- It is a very usable format for aviation CBT.

**NOTE:**

- Check with courseware suppliers for suitability of graphics adapters with high resolution.

**R.8 USE OF TIFF FILES FOR THE INTERCHANGE OF RASTER GRAPHIC INFORMATION WITH THE FOLLOWING ENCODING METHODS:**

- **NONE** when display speed is required (bigger files)
- **CCITT GRP 4** b&w documentation (ATA compatibility)
- **PAKBITS (RLE)** bitmapped drawings (fast, lossless)
- **JPEG** photographic images (variable size/quality ratio)

**RATIONALE:**

- TIFF is a trademark of **Aldus Corporation**. LZW compression scheme requires licensing Unisys.
- The purpose of TIFF is to describe and store raster image data that typically comes from scanners, frame grabbers, and paint- and photo-retouching programs.
- A primary goal of TIFF is to provide a rich environment within which applications can exchange image data. This richness is required to take advantage of the varying capabilities of scanners and other imaging devices.
- TIFF is maintained by the **TIFF Advisory Committee** (working group of TIFF experts from a number of hardware and software manufacturers) and will be enhanced on a continuing basis as new imaging needs arise. A high priority has been given to structuring TIFF so that future enhancements can be added without causing unnecessary hardship to developers.
- The most recent version of the TIFF specification is available on CompuServe ("Go ALDSVC") and on AppleLink (Aldus Developers Icon).
- TIFF is capable of describing bilevel, grayscale, palette-color, and full-color.
- TIFF includes a number of compression schemes that allow developers to choose the best space or time tradeoff for their applications.
- TIFF is not tied to specific scanners, printers, or computer display hardware



- TIFF is portable. It does not favor particular operating systems, file systems, compilers, or processors. and is supported by software in the PC (MS-DOS, MS-WINDOWS and OS/2), UNIX, and Mac environment

**NOTE:**

- Please refer to AICC White Paper (document no. CRS005), **AICC BitMap Graphic FileFormat** for additional information on this recommendation.

**R.9 IF NETWORKING, ANY NETWORK COMPONENT COMPATIBLE WITH MICROSOFT WINDOWS 95.**

**RATIONALE:**

- The choice of Networking Operating System and Hardware for sever and links is large enough to accomodate any user requirement.
- Novell, our previous recommendation, is supported by Windows 95.

**R.10 IF NETWORKING, USE ONLY FILE-SHARING CAPABILITIES FROM NETWORK OPERATING SYSTEM.**

**RATIONALE:**

- Courseware must remain independent from the network operating system.
- Some incompatibilities may appear between two versions of the same network operating system.