Making CDTV Titles That Work on Amigas

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In the coming months Commodore plans to begin delivery of the A570 drive. This CD-ROM peripheral for the Amiga 500 and Amiga 500 Plus should rapidly expand the installed base of CDTV-compatible players. With over 3 million Amigas sold worldwide, the potential for the A570 is enormous.

The A570 presents exciting opportunities for CDTV developers. It also presents a certain number of challenges. Great efforts have been made to ensure compatibility of titles for both platforms. However, there are numerous differences between the CDTV and the A570: keyboard plus mouse vs. remote control, TV sets in a living room vs. RGB monitors on a desktop, Kickstart 2.04 vs. Kickstart 1.3, etc.

With the availability of the optional keyboard for CDTV players, many users now attach a keyboard to their CDTV. Other users have attached CD-ROM peripherals to their Amiga 2000 or A3000 computers, and need keyboard support from titles.

To ensure strong sales of your title on all the systems capable of playing CDTV discs, your title should take advantage of the new features of the A570, yet remain easy-to-use on the CDTV player. This article discusses the differences between the two systems, and presents extensions to the *CDTV User Interface Guidelines* to allow titles to run on both platforms.

Physical Differences

The A570 does not include the following items found on the CDTV player:

- ❏ Infrared remote control.
- ❏ Audio CD control buttons (Play, FF, etc.).
- ❏ Fluorescent display.
- ❏ Personal RAM Card slot.
- ❏ RF or composite video output to TV or VCR.
- ❏ MIDI ports.

Of course, functional equivalents of most of these items are already a part of the Amiga 500; many others are available as options.

Although the Amiga lacks the standard CDTV resources above, the Amiga connected to the A570 provides resources not available on all CDTVs. Every title running on an A570 will have access to a floppy disk drive and a keyboard. CDTV titles should support saving to a floppy, along with saving to a personal RAM card.

Operating System Issues

Kickstart 1.3 vs. 2.04

The A570 connects to either an A500 running Kickstart 1.3 or 2.04, or an A500 Plus running Kickstart 2.04. It is imperative that your application work in both these environments. The A570 uses the Kickstart ROM routines found in the host computer. It contains its own ROMs which provide the CDTV-specific functions (*cdtv.device*, *playerprefs.library*, Audio control panel, CDTV Preferences, etc.)

What Am I Running On?

It is possible for applications to detect if they are running on an A570 or on a CDTV player. There is an A570-specific module called "A690ID". A title can test to see if this module is present using the *exec.library* function `FindResident()`. If the "A690ID" module is present, the title is running on an A570-equipped A500.

Memory

An Amiga with an A570 may have various amounts of RAM. In a CDTV the minimum memory configuration is 1 Mbyte of Chip RAM. Do not assume that all systems have the same memory configuration. Some users might try to run your application on an Amiga + A570 with only 512K of Chip RAM and no Fast RAM. Others may have a 512K Chip/512K Fast RAM system. To avoid crashing due to memory shortages, check the amount of memory available when your application begins execution. If not enough memory is available, you should display a message to that effect and stop operating rather than crashing the machine.

Others may have more than 1 Mbyte of RAM: either Fast or Chip memory. Your title should also work properly under these conditions.

Emulating the Remote Controller

One of the major differences between the A570 and the CDTV is the remote controller. The Amiga’s keyboard, the mouse, and, optionally, the joystick replace the remote controller. Your title must take these differences into account, and your input handling routines may require modification. The following section will discuss these differences, and make additions to the *CDTV User Interface Guidelines*.

Here is a chart describing how Amiga keyboard and mouse actions should correspond to the CDTV player’s remote controller buttons.

CDTV Remote Controller Emulation

Remote Controller	Amiga Keyboard	Amiga Mouse/Joystick
cursor buttons (directional arrows)	Cursor keys	Mouse movement
'A' button	Left Alt + Left Amiga, Left Amiga key alone, F9 function key, 'A' key on keyboard	Left button
'B' button	Right Alt + Right Amiga Right Amiga key alone, F10 function key 'B' key on keyboard	Right button
0-9 buttons	Keyboard 0-9 Keypad number keys	
ESCAPE	Esc and Help	
ENTER	Return or keypad Enter	
REW	F1	
PLAY	F2	
PAUSE	F3	
FF	F4	
STOP	F5	

Cursor Buttons

An application that runs on an A570 can emulate the four directional arrow buttons on the CDTV remote control using two methods: via mouse movements *and* via the four directional arrows next to the numeric keypad. Titles should support both methods of cursor control. Jumping highlights are easy to control using the arrow keys. If the title has a pointer, the user should be able to move it using the mouse, but, in case the user doesn't have a mouse, titles should also allow the user to move the pointer with the arrow keys.

The 'A' and 'B' Buttons

The A and B buttons on the remote correspond to the left and right buttons on the mouse. If the user prefers to use a keyboard for input, he can use any of the following:

The left Alt/left Amiga combination for the 'A' button and right Alt/right Amiga for the 'B' button.

The left Amiga key (raw keycode 66 hex) alone for 'A', and right Amiga key (raw keycode 67 hex) alone for 'B'.

The F9 function key (rawkey code 58 hex) for 'A' and F10 function key (rawkey code 59 hex) for 'B'.

the A (for left) and B (for right) keys on the keyboard.

By offering a keyboard equivalent to the ’A’ and ’B’ button, users with keyboards will not have to move their hands from the keyboard to the mouse in order to confirm a selection. It also avoids accidental movements of the mouse when pressing the rodent’s left or right button.

The F9 and F10 function keys were selected because of their convenient location near the directional arrow keys on the keyboard.

Supporting the ’A’ and ’B’ keys on the keyboard is more complicated. The ’A’ or ’B’ key on the keyboard cannot be equivalents for the remote’s A and B buttons during the input of a text string. In other situations, however, this mapping can be helpful to the neophyte user.

If a title uses the console device, it should support both uppercase and lowercase (’A’ and ’a’). Furthermore, the raw keycodes for the ’A’ and ’B’ keys must always be translated via the active keymap to determine the actual ASCII value. The *rawkeyconvert.c* routines in the ROM Kernel manual give an example of this translation process.

If your title reads raw keycodes directly, beware of using raw keycodes for the ’A’ and ’B’ keys on the keyboard, as the raw keycodes may change if the user has a French keyboard. The French keyboard has reversed the position of the ’A’ and the ’Q’ keys. If you choose to have raw keycode support, you should accept both the ’A’ (raw keycode 20 hex) and ’Q’ (raw keycode 10 hex) for the ’A’ button, and ’B’ (raw keycode 35 hex) for the ’B’ button.

0-9 Buttons

The 0-9 and ENTER buttons located in the center of the remote are replaced by the Amiga keyboard’s numeric keypad. The keycodes of the remote represent those found on the keypad, the only difference being the reversed physical layout of the keys:

Remote	Numeric keypad
1 2 3	7 8 9
4 5 6 0	4 5 6
7 8 9	1 2 3
	0

Your code will probably not have to be modified to take this into account, unless it displays 9 icons in a grid pattern, and wants the user to type in a number corresponding to a certain position. If you support a jumping highlight (as suggested in the *CDTV User Interface Guidelines*), this should not be a problem.

Your code should also support the 10 numeric keys on top of the alphanumeric keyboard (just below the function keys) for input of numbers.

Escape Key

The ESCAPE key requires special attention with a keyboard. On the CDTV remote control, the ESCAPE key generates the ESCAPE rawkey code of 45 hex, the same code as on the A500's keyboard. The *CDTV User Interface Guidelines* recommend that titles use the ESCAPE button as a HELP key.

Help Key

The A500 keyboard has a Help key, rawkey code 5F. To run effectively on both the CDTV and A500 with an A570, applications should support both the Escape key and the Help key to obtain Help functions. If an application detects that the user has pressed either the Help key or the Escape key on the Amiga keyboard, the application should provide a help function to the user.

REW, PLAY, PAUSE, FF, STOP

These keys are mapped by the A570 ROM to the F1 through F5 keys on the Amiga keyboard. The Audio Control Panel uses these equivalents to play CD audio discs. If a title detects a keypress on F1 through F5, it should react as if the user had pressed the corresponding remote control button.

Certain titles ported from the Amiga to the CDTV may have already established alternate uses of the F1 through F5 keys on the keyboard. Any such application that retains its mapping of the F1 through F5 keys for its A570 version should clearly document these alternate key mappings in its manual.

Genlock

The Genlock button on the CDTV remote is for mode selection of an optional video genlock device that can be installed in the CDTV. This button has no equivalent on the A570. If you want to support this feature in an application running on an A570, you cannot be sure that the genlock used with the Amiga supports software control of mode switching. Again, mention this fact in the user manual.

CD/TV

This button on the CDTV remote controller determines whether the TV/monitor displays input from the CDTV or from the broadcast (or cable) TV source. This button has no equivalent on the A570. If the user has his Amiga connected to a TV set, his existing cabling handles this switch-over.

JOY/MOUSE

This button on the remote determines whether the remote's cursor buttons respond as a joystick or as a mouse. This is not necessary on the Amiga + A570: to enter joystick mode, the user simply plugs a joystick into the Amiga. To enter mouse mode, he uses his mouse.

Some CDTV applications only support one mode or the other. Titles should support both modes, if possible. If a title only supports joystick mode and the title cannot be reasonably controlled from the keyboard, you should indicate this on your packaging, as an Amiga + A570 user might not have a joystick.

Screen Design Issues

The typical CDTV user is sitting approximately 3 meters from his TV set. The typical A570 user will be sitting less than one meter from an RGB monitor. These differences require some foresight on the part of your application.

Fonts

For CDTV usage, a typical font should be no less than 18 points high. This permits the user to easily view text from a distance. An A570 user might prefer a smaller font in order to have more text on the screen, especially when using text-based applications. In this case, an application should offer a selection of at least 2 different-sized fonts to the user.

Three Levels of Support for the A570

Full support for the A570 implies numerous constraints for the CDTV developer. He has to worry about supporting a keyboard, working with different versions of the operating system, dealing with varying memory configurations and working around differences between Amiga and CDTV displays. The issues of starting, exiting, and multitasking titles remain.

There are several Amiga/CDTV configurations that may be booted into a CLI or Workbench environment: Amiga + A570, any Amiga computer equipped with a CD-ROM, and a CDTV player with a floppy or hard disk attached. In these cases, the user may want to launch a CDTV title from that environment. If he does so, he will expect the title to exit cleanly, release all memory, remove any special assigns that may have been executed, etc.

Users may even want to multitask a title. Most Amiga applications may be multitasked, and the user may well expect the same from a CDTV title. Reference titles would be significantly enhanced if they supported cutting-and-pasting directly into another application like a word processor. Those developing dictionary and encyclopedia titles may want to provide access methods for users or other applications to search on a key word. Some may even want to add an ARexx port.

These issues, while reasonable requests from a user, add significant new burdens to the developer. Many CDTV titles are designed to take over the machine. Many of these titles require all the memory available in the system (and even more, in some cases). They often make special assigns for fonts, data, etc. Many include no clean-up code.

Full compliance to AmigaDOS standards may be unreasonable for some titles. To address this problem, we have established three levels of compatibility for CDTV titles running on Amigas: *Minimal Support*, *Support For Workbench Startup and Exit*, and *Full Multitasking Support*.

Level One–Minimal Support

An application that meets Level One support requires only a few enhancements from a standard CDTV-only title.

1) Supports input from the keyboard and the mouse.

2) Runs under both Release 1.3 and Release 2 of the operating system (which is expected of all CDTV titles).

3) Includes a way for the user to start the title from a CLI and the Workbench. Such a title may reboot the system when it starts up. It may take over the entire system, refuse to multitask with other programs, have no cleanup code, and never exit.

Commodore has developed a standard icon and associated code, called *BootCD*, which developers may include on their CDTV disc. This icon will appear from the Workbench. If the user double-clicks it, a message will appear telling the user to remove any floppy disks from the drive, and warning that pressing the Continue gadget will reboot the system. If the user continues, *BootCD* will reset the system, and the system will then boot directly from your title on CD-ROM.

Level Two–Support For Workbench Startup and Exit

This level provides the user with a way to run CDTV applications without rebooting the system. A Level Two compliant title will also return cleanly to the Workbench or the CLI when it is finished. This stage requires that a title:

1) Supports input from the keyboard and the mouse.

2) Runs under both Release 1.3 and Release 2.0 of the operating system.

3) Launches from either the Workbench (via an icon) or the CLI.

4) Manages any resources it allocates.

5) Safely and Cleanly aborts in case any resource allocation fails.

6) Cleans up properly upon exit, closing all libraries and devices, and returning all memory.

7) Remembers the environment from which the user launched the title. If the user started the title from a CLI or Workbench, the title must be able to restore that environment cleanly. If the title was booted directly from the CD-ROM, before exiting, the title should take precautions against leaving the system in an unusable environment. For example, if a title makes all of the Workbench colors black using the *devs:system-configuration* file, the user should not be allowed to return to the CLI or Workbench, as the user will only see a black screen.

In level two compatible titles, temporary assigns are acceptable. The application may assign system directories (such as fonts:, sys:, etc.) to the CD during startup. If it does so the title must restore any of the assigns it reassigned.

A simple way to launch a title from a Workbench icon is using the *IconX* utility. This allows you to create a script that the system executes when the user clicks on the program icon. This script may contain any assigns that a title requires.

An easy way a title can tell if the user booted directly from the CD-ROM is checking for special command line arguments. Imagine your title is called ‘‘MyApp’’. When the user boots the system from the CD-ROM, the *startup-sequence* launches the application by using a special command line, for example: ‘‘MyApp ss’’. The ‘‘ss’’ tells the title that the system was booted from the CD-ROM. If the user starts the application from the CLI, he would simply type ‘‘MyApp’’. A title might even utilize another special command line option to tell if it was launched from an *IconX* script (i.e. ‘‘MyApp iconx’’). Using this method a title can detect how the user started it and can choose an appropriate exit plan.

Level Three–Full Multitasking Support

A title conforming to Level Three support allows users to multitask freely (given sufficient memory). These titles must include support for points 1) through 7) above. Furthermore, Level Three titles may not re-assign any directory assigns that the system requires (i.e. fonts:, sys:, s:, etc.).

If a title in this category needs to access a particular font on the CD-ROM, it should not re-assign *fonts:* to *cd0:fonts*. Instead, it should refer to the full path name of the CD via the volume name of the disc (for example, *MyDisk:Data/MyFile*). You should not refer to the device name (cd0:) since this may vary, either with more than one CD-ROM peripheral attached, or a different device name for a third-party drive.

If your title does refer to a volume name, be careful when pre-mastering the title. Make sure you enter the correct volume name when running the ISO utility. If another company does the pre-mastering for you, make sure they use the correct volume name.

Conclusion

Full support for the A570 does require a certain amount of effort on behalf of the CDTV developer. Many of these points are also relevant for those CDTV owners that expand their unit to be an Amiga.

Remember, you are not obliged to support all these features. Many CDTV applications take over total control of the system, and are not designed to multitask. There is nothing wrong with doing this, even if you want your title to run on the A570. If you include Level One support, you can insist that your title be booted directly from the CD. It is better to have a title which runs perfectly on the CDTV than one which is awkward to use on both the CDTV and the A570.