riginally set for release mid-1996 Mac OS 8, code-named Copland

has had a number of set backs and now isn’t due until mid-1997, at

least. Mac OS 8 is designed to improve the performance of current

Macintosh applications, and will drive a new generation of

multimedia and productivity applications. Mac OS 8 will be

optimized to take advantage of the power of PowerPC RISC

processors, incorporate advanced multitasking capabilities, and

integrate memory protection capabilities to improve the stability of

the computing environment, something which is long overdue...

n terms of performance Mac OS 8 will gain significantly by being

almost entirely written in native code for PowerPC processors. In

addition the new technologies in Mac OS 8 include improved

algorithms that run more efficiently. To get the increased

performance, however, applications must make use of these new

technologies. At the present time Mac OS 8 will require a PowerPC

processor to run although there are rumours that Apple are

working on a 68K version for release at a later date.

nlike previous versions of the Mac OS, Copland will let users

choose from a variety of desktop styles that affect the look and

feel, and in some cases even the sound of the Mac's user interface.

Styles include the standard 3D look, a kids type style with animated

flip-down menus accompanied by amusing sounds, an At Ease style

with one-click buttons and a hi-tech look. In addition, all windows in

Copland will contain a small icon to the left of the window's name in

the title bar. Users can directly manipulate the item the window

represents by dragging the item's title-bar icon to a destination

elsewhere on the screen. If the destination is on the same storage

device as the item, this action moves the item; if it is on a different

storage device, this action copies the item. The Copland user

experience includes several new interface elements to make it

easier for users to manipulate items directly. In addition to the

title-bar icon, mentioned earlier, Copland adds the spring-loaded

folder, which causes a folder to open when an item is dragged over

it. By dragging an item over successive folder icons, a user can

drop the item into a deeply embedded folder with one movement.

When the user finally drops the item into a window, all of the

intermediate windows opened during the extended drag operation

close automatically, thus reducing screen clutter. Another interface

element is called the pop-up window; it allows windows to remain

open without cluttering up the desktop. Under Copland, users can

drag a window to the bottom of the screen, where its title bar is

shortened to allow multiple title bars to show. When the user drags

an item onto a shortened title bar, the full window displays itself,

and the user can drop the item into the window. When the user

activates another window, the pop-up window minimizes itself

again at the bottom of the screen.

t Copland's core lies the microkernel, the behind-the-scenes

arbitrator of the complex machinations that make Copland such a

significant advance over System 7.5. The microkernel will be

responsible for managing memory (including virtual memory),

allocating CPU time to all software, applications running in the

compatibility box, preemptively multitasked server tasks, and the

OS itself, and several other low-level activities, such as

interprocess communication. As its name suggests, the microkernel

is only a tiny bit of Copland's code, but its performance and

reliability will be critical to Copland's success and considering the

resources that Apple has dedicated to perfecting it, we consider the

probability of that success to be good. Copland will have a vastly

improved virtual-memory system, resulting in better performance

of the code-fragment manager, the part of the OS that's responsible

for loading into memory only those parts of an application that are

actually needed at any given moment. Applications will load faster

and require less RAM. Applications will also be able to spin off

multiple server tasks into their own protected memory spaces.

There they will be able to run unattended in the background, safe

from most system crashes. However, only those processes that do

not require user-interface activity will be able to become server

tasks.

n the current Mac OS, applications compete for CPU resources,

with the result that some hog processing power while others starve.

Copland will reduce this anarchy by using a technique called

pre-emptive multitasking, in which the OS takes over resource

scheduling, but only for server tasks and some OS functions. The

result will be faster, more responsive performance of file and

network I/O and greatly improved background-task performance.

ven though Copland is fundamentally different from the current Mac

OS, current applications will run without modification in what Apple

engineers call the compatibility box. One important benefit: If an

application crashes, only the compatibility box will need to be

rebooted - most core system functions, extensions, and server

tasks should remain unaffected, resulting in a greatly reduced

rebooting time.