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PowerBook: Above 10,000 Feet, Keep In Pressurized Cabin (5/96)

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Security: Everyone

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TOPIC -----

The Getting Started manual for my PowerBook states that the computer should not be operated above 10,000 feet. Does this mean that my PowerBook cannot be used on airplanes that cruise above 10,000 feet?

DISCUSSION -----

Macintosh PowerBook computers can be used in airplanes, provided the cabin is pressurized under 10,000 feet. Some models can be transported in airplanes with pressurization no higher than 15,000 feet.

Commercial airliners generally maintain cabin pressure to an 8.5 psi differential. As an example:

Cruise Altitude	Cabin Altitude
22000 feet	Sea Level
25000 feet	1420 feet
30000 feet	3640 feet
35000 feet	5600 feet
40000 feet	7290 feet
45000 feet	8670 feet

Only the Concorde cruises above 45,000 feet. That aircraft utilizes a special fuselage design which can sustain much higher differential pressures than 8.5 psi, which allows it to keep the cabin pressure well under 10,000 feet as well.

From this, it is apparent that cabin cruise altitudes will not exceed the 10,000 foot limitations of most PowerBook computers. There are, however, the following points to be made.

So what's the risk?

On PowerBook computers, when altitude limits are exceeded, the principal risks we have observed include general operational problems, hard drive problems, and even the possibility of screen cracking.

Destination higher than 10,000 feet

We are not aware of any airports in the United States with elevations higher than 10,000 feet. Such destinations do exist in other countries. Since the airplane must land, its cabin pressure will eventually be raised to the landing altitude. However, we also discourage the use of the PowerBook at such elevations.

Is the cargo hold pressurized?

The cargo compartment of most commercial airliners is, in fact, part of the airplane's pressure hold, and is pressurized. Check with your specific carrier if in doubt.

Cargo hold risks

The cargo hold brings a combination of other threats. The combination of lowered air pressure during cruise (see above), lowered temperature (the cargo area is typically much cooler than the passenger cabin), and vibration can all combine to create a very hostile environment. In addition, suitcases, which tend to be moist environments, can be cooled such that condensation will appear on solid surfaces. This could further aggravate the situation.

In addition, the risk of damage by rough handling or damage from other suitcases is increased when out of sight of the owner.

Private planes

Most light private planes are not pressurized, but many can climb above 10,000 feet. Even if a light plane has a pressurized cabin, its cargo area may not be. Some light aircraft with high altitude capabilities and unpressurized cabins utilize oxygen systems to keep the occupants shipshape.

Some business jets similarly have unpressurized cargo compartments.

Military aircraft

Military aircraft come in all forms. Fighter cockpits, for example, tend to pressurize to a 5 psi differential, so their cabin altitudes will tend to be much higher than on a passenger jet. Check with the operator to determine what the likely environmental extremes can be.

Are there any other risks?

If the cabin undergoes decompression, the PowerBook could be exposed to extreme environmental factors.

Some all-cargo operators may opt to shut down a portion of their pressurization system, thus increasing fuel efficiency. This would have the effect of raising cabin altitude, possibly to limits which could comprise a threat to a PowerBook.

Some air taxi operators do not use pressurized aircraft, but may normally cruise in the 8 to 9 thousand foot range. In some circumstances, such as weather avoidance, they may climb above 10,000 feet.

So what does Apple recommend?

Apple recommends transporting the PowerBook in the passenger cabin, and not utilizing it above 10,000 feet. Damage caused by hostile operating or storage environments is not covered by the Apple limited warranty.

Users concerned about these issues are encouraged to investigate comprehensive insurance to protect against the financial consequences of inadvertent damage.

Article Change History:

20 May 1996 - Added detailed technical information.

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