

MORE FROM BILL RATHJE ON DEADLY LITTER

Following up his guest blogging on exo-garbology [\[Link\]](#) [\[Link\]](#), Bill has put me on to this piece issued by AP today – “Orbiting space station is like a cluttered attic”

CANAVERAL, Fla. – There’s no space in the space station. So a few weeks ago, the two astronauts who live there tossed out some useless junk, like so many old hubcaps for the trash heap.

Only this stuff floated away in space.

And the throwing-away – done during a recent spacewalk – was done cautiously so that the discarded antenna covers and expired pump panel didn’t become deadly boomerangs.

Such is life in space, post-Columbia.

With no garbage pickup by shuttles for nearly two years, the international space station is looking more and more like a cluttered attic.

“Room limited,” is how the affable astronaut Mike

Fincke describes it.

The problem is, shuttle deliveries and pickups won't resume until spring, and that's if NASA is lucky. A barrage of hurricanes and their devastating blow to NASA's launch site may well delay the next shuttle flight, by Discovery.

So the stuff will keep piling up and up.

"It's at the point where we have to figure out a way to handle it. You can't just wish it away. The garbage man isn't coming tomorrow to take everything away for you," says astronaut Kenneth Bowersox, who was the space station's skipper when shuttle Columbia went down.

Astronaut Michael Foale, another former space station commander, says even more important than what Discovery brings on that first flight will be what it takes away.

"It's essential that when that first shuttle comes up, before they do anything, is they start to clear out the items that we need to deliver back to Earth on the shuttle," Foale says.

During Foale's six-month station stay, which ended in April, the overcrowding slowed him down and began to affect his work.

"It's limiting our efficiency maybe by a percent or two, as we have to move some items out of the way when we get to a panel behind it," Foale says.

"But we are nowhere near as critical as I thought we were on space station Mir," adds the former Mir resident.

NASA takes little comfort in the fact that the 6-year-old space station isn't as dingy or messy as Russia's Mir, which tumbled from the sky in 2001 after 15 years of operation. The whole point, from the very beginning, was to avoid a pigpen in orbit. Yet here NASA is, on the verge of creating a mirror image of Mir.

"We're in a constrained situation right now," observes Suzan Voss, manager of NASA's cargo integration office. "But it's still a safe situation."

Columbia's catastrophic plunge from the sky on Feb. 1, 2003, grounded the shuttle fleet and halted all space

station construction.

The Russian Space Agency has been sending manned capsules and supply ships to the station. The cargo carriers have provided backup stores of precious oxygen that have come in handy during the repeated breakdowns of the station's main oxygen generator, a vexing problem that eventually could force an evacuation. But the Russian spacecraft can hold, at most, only a third of what the shuttle can carry and they are not exactly frequent fliers.

Little can be returned to Earth in the capsules besides the astronauts themselves, and the cargo ships are cut loose and incinerated in the atmosphere. So only trash goes into the carriers before undocking – empty food containers, dirty clothes, aluminum toilet cartridges full of solid waste.

During the Mir years, cosmonauts routinely dumped things overboard in bags. International accords frown on that now; the objects could become dangerous pieces of space junk.

The Russians made sure that wouldn't happen during

September's spacewalk. The discarded antenna covers already have fallen harmlessly out of orbit, for instance, and the pump panel should plunge through the atmosphere in flames by year's end.

"Now if we were just desperate, that might be something that was done," Bowersox says, referring to large-scale dumping. "But we're not near that."

Among the bigger items taking up valuable space on the station until shuttles soar again: racks holding science experiments; broken exercise equipment and other machines; worn-out spacewalking suits; and more than a dozen rendezvous and docking devices in need of an engineering face-lift by the Russian Space Agency, which can no longer afford to keep making or buying new parts.

Among the smaller items: undeveloped rolls of IMAX film, tucked between water bags to protect against radiation; astronauts' personal belongings, like Bowersox's shirts with his crew insignia and the ugly slime-colored tie he wore when he needed cheering up; and duffel bags that once served as suitcases.

Everyone has had to be “very inventive” in making use of any so-called empty space, Voss says.

It’s akin to organizing a jammed clothes closet, says station operations manager Mark Geyer, whose 11-year-old daughter’s closet recently got a makeover with modular shelves and drawers.

“The only difference is you can’t go to Home Depot and find the stuff. You’ve got to use what you have on board,” Geyer says. “But the team has done a great job in looking in places that we wouldn’t normally have examined.”

As Bowersox sees it, the problem predates the Columbia accident.

“If you look at how this is happening, it’s not because we all want a lot of clothes or we all want a lot of extra food up there or because we’re being sloppy,” says Bowersox, who now serves as director of NASA’s flight crew operations.

“It’s because we want a bunch of spare parts up there. We’ve got extra suits. We’ve got extra parts to repair

the components outside the station, all these things that we're trying to pack aboard for contingency. And from the very beginning, we've kind of pushed it to the limit of what we wanted the crew to have to live with."

Many NASA officials, Bowersox included, wonder what will happen when the three remaining space shuttles are retired around 2010 to make way for President Bush's envisioned moon shots, and the station has to depend solely on unmanned supply ships. None of these vessels will be able to carry up all that a shuttle can, nor can they return anything to Earth.

Spare parts will have to be stockpiled on board, and that means even more crowding unless equipment can be kept outdoors or some kind of storage room can be launched and attached.

For their part, Fincke and cosmonaut Gennady Padalka are trying to tidy the place for their replacements, who are due to arrive in just over a week.

Fincke would love to toss out more, but as he told Mission Control back in June: "Always, always, always feel free to come back and say 'No, that is the most

valuable thing on the planet, we can't throw it away.”‘

Bowersox acknowledges that a neat freak would be, well, freaking out aboard the space station. But he adds with a laugh: “From what I've been seeing, the folks they've been sending up there, we don't really have a problem.”

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