

# The Moose is Loose

# C-17: the 4-Wheel-Drive Airlift

What they wanted was an aircraft that could be filled like a Walmart store in December. It had to land on any type of runway, even one the length of an aircraft carrier (less than 3,000 ft.), or on no runway at all. What they got was a four wheel drive air lifter which, because of its front-end appearance and the sound made by the wing vent boxes during ground refuelling, is affectionately called “Moose” – *how Canadian is that?*

The C-17 Globemaster III boasts a cargo capacity of 170,900 lbs. In comparison, the Lockheed Martin C-5, used by the US Air Force, can carry more (261,000 lbs), but it has no STOL capabilities to get into the forward areas. Canada’s aging C-130s might get into those areas, but its 50,000-lb capacity can’t accommodate a Canadian Forces Leopard tank – which the C-17 can also airdrop.

*The Moose* was introduced to Canadians when it flew in aid during the Winnipeg floods and the Quebec/Ontario ice storm, and today there are Canadian Forces pilots and loadmasters based at McCord air base who are familiar with the aircraft on an operational level.

At nearly five stories high (174 ft long with a wingspan of 169 ft, 8 inches), the hightailed airlifter is powered by four Pratt & Whitney PW2040 turbofans, military versions of those on the reliable, tried and tested Boeing 757s.

## Real-Life Scenarios

- *There’s a terrorist you need to apprehend in the no man’s land somewhere in the Pakistan/Afghanistan area, but without an airfield, the Special Forces humvees can’t reach him. So you get five C-17s from an airbase in Germany and they airdrop the construction equipment at night. Once a strip is levelled, the C-17s land on it to let the Special Forces off, recover the equipment and return home. The next morning, the locals wonder: “That wasn’t here yesterday, was it?”*
- *Attack helicopters are urgently needed at a forward location in the Middle East, but nearby units can’t be spared. So you load up a C-17 in the continental USA with four Comanches plus 28 personnel and get them there. But the helicopters have no fuel, so you then fly up to a tanker orbiting above, fill up with gas, go down to the airfield and defuel it into the helicopters.*
- *A movie star has to be picked up from his Pacific Ocean home and flown to Iceland – at 10,000 lbs, he not only won’t fit into a Lear jet, he needs to be transported while still in his hot tub. His “carry-on luggage” is 70,000 lbs and includes a large boat – and everything has to be landed on a tiny 3,900 ft Icelandic airstrip. To the relief of his fans worldwide, Keiko the Orca (of the “Free Willy” movie fame) was successfully flown to his new home, thanks to a C-17 and its crew.*

The C-17 looks smaller from the outside than it does from the inside – an optical illusion that is hardly surprising. Its width was determined by putting two five ton trucks side by side; an Apache helicopter was used to determine its height; and the floor strength is based on the M1 tank. It can carry greater and a wider variety of payload over intercontinental distances and yet land them onto semi-prepared strips. To Boeing, the United States military, and the Royal Air Force, it is a strategic air lifter that can “go” tactical.

But unlike all other airlifters available today, this is a 21st century, post-Cold War warrior – highly computerized and designed for simplicity and ease of maintenance so that its crew of three can monitor all systems during flight, identify a problem, correct or isolate it to be fixed later.

Examples could be as “low tech” as the bilge tunnel under the cargo floor that is accessed from a hatch near the loadmaster station. It has two rails with a “creeper-type cart” on which the loadmaster or maintenance person can scoot along while he/she checks the systems in there.

Or the rungs within the vertical tail allow personnel to climb up onto the horizontal stabilizer to inspect equipment. Or the ingenious “extended” seats: all airlifters have sidewall seats that as in movie theatres fold up when not in use, but only the C-17’s seats can be extended to accommodate bulky paratroop backpacks.

Or the unique feature could be as “high tech” as containing all of the fuel in a “wet wing” configuration – no fuel bladders here. And to prevent what happened to TWA Flt 800 in 1996 (when the fumes in an empty tank ignited off Long Island), an inert gas generating system produces a non-combustible gas from the inboard engines to pressurize the vapour space within the empty tanks. Another example is the use of a control stick instead of a yoke – this avoids obscuring the instruments or interference from the pilot’s legs.

But what never fails to amaze – is the fact that that the C-17 can actually taxi backwards, a convenience particularly useful in tight loading areas. This is possible because the engine cowling sleeves slip aft, exposing baffles in the top of both the engine fan and core and exhaust from the engines are directed upward and forward to make the aircraft back up.

Yet nothing demonstrates better that the airlifter is truly post-1990s than the litter stanchions. They are stacked four deep on the C-130 or C-141 because the concept, during the Cold War, was to fly patients to hospital at overseas bases like Lahr and tend to them there. Today, with the pull-back of forces from Europe, patients are stabilized on the plane as they are flown home to Canada. To give medical personnel more access to the patients en route, Boeing increased spacing between the litter stanchions so that on the C-17 they are only three deep.

In all, 9.5 million parts go into the \$160 million aircraft, with over 900 manu-



facturers supplying them. And while components come from as far apart as Arizona (*wiring*), France (*wing skins*), and Israel (*strake*), it all comes together at Long Beach, California.

For Canadians, the Long Beach plant is an historic place – for four decades Air Canada came here for their DC-8 and -9s and Canadian Airlines their DC-10s.

That the C-17 can do so much should come as no surprise. Deep down in its genetic makeup are the C-47 and the C-54, both of which kept Berlin from starving in 1949.

Now, from the same family comes their grandchild. First flown on September 15, 1991, the C-17 is wholly a child of this century. In its short life, it has taken relief supplies to earthquake victims in China, Turkey and Iran, spacecraft to NASA, flown President Clinton to Bosnia, Donald Rumsfeld to the Middle East, and recently made possible the largest paratrooper drop since World War II, into Iraq.

During the recent tsunami disaster, Canadians were made painfully aware of their forces lack of airlift capability. The deployment of the DART to Sri Lanka required five Antonov-124 loads and one CC-150 load – and took over a week. Boeing has calculated that four C-17s could have completed that in 82 hours. And, as aid workers know, in distributing relief supplies, aircraft can only take them so far and then helicopters are needed to get them into the outlying areas fast. As the final end of the distribution chain, a Chinook helicopter has to be brought in quickly – and that is what the C-17 can do. Much of the current CF equipment is not transportable by the current C-130

fleet. But a single C-17 can carry four to six Bisons, Cougars and/or Grizzlies. Alternatively, unlike the C-130, the aircraft can carry three Stryker Mobile Gun Systems plus two light trucks and 38 personnel.

The big stumbling block for the C-17 is its price – in 2000, the unit price was approximately \$200 million. Boeing is aware that buying the C-17 outright is beyond what the CF wants to do. So they have offered it on lease in the manner similar to what the United Kingdom has done. The British Forces have committed to purchase A400Ms but the RAF had a short-term strategic airlift requirement. With C-17s readily available, they leased four of them in May 2000.

For ever-penurious Canada, Boeing insists that there would be no need to increase the money already being spent on airlift. They calculate that about \$100 million could be saved if 12 of the oldest C-130s were retired (money saved in maintenance, gas guzzling and upgrading) and \$50 million could be saved if the Antonovs were not chartered. The net saving of \$150 million would allow DND to lease four C-17s and this would include 800 hours of training and maintenance etc., and at the end of the 25 or 30 year lease period, the CF would own the aircraft.

Is *the Moose* too large for Canada? “It’s as if you bought a pickup truck,” illustrates Len Tavernetti, the Senior Manager of C-17 Marketing, “and your wife asks ‘why do you need a pick up truck? Its only going to sit in the drive way.’ Well, soon your neighbour wants to use it to haul his new washing machine, and that starts a trend and suddenly the pickup becomes so useful you wonder how you ever did without it. You find that because you have that capability you or your friends are going to use it. When we went from horses to cars there was the argument ‘why do we need a car? Its only going to sit in the driveway all the time and we will only take it to church on Sundays.’ Soon you stopped using the horse and the car became indispensable.”

When it comes down to it, there only so many strategic airlifters available in the world today. The Antonovs, like the C-5s are wearing out fast. Will the Moose take their place? After all, Canada is its natural habitat. **F**

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Pratt & Whitney PW2040 turbofan engine.

