A3XX-100F offers little payload advantage

Despite the A3XX-100F having a 242,000lbs higher MTOW, it provides only a 18,000lbs higher structural payload than the 747-X Stretch freighter. Because of its shorter ceiling height on its maindeck and shorter fuselage. The A3XX-100F also has a smaller maindeck containerised freight volume. Overall, the A3XX-100F has a smaller total containerised volume and smaller volumetric payload than the 747-X Stretch freighter.

The A3XX-100F offers little structural and volumetric payload advantage over the 747-X Stretch freighter *(see table, this page)*. Despite the A3XX-100F having a 139,000lbs higher maximum zero fuel weight (MZFW) than the 747-X Stretch, the A3XX's structural payload is only about 17,000lbs more than the 747-X Stretch's because the A3XX-100F has a proportionately higher operating empty weight (OEW). Taking into account crew and equipment weight, the A3XX-100F has a structural payload of 330,470lbs. The 747-X Stretch has a structural payload of 312,870lbs and the 747-400F, 248,370lbs.

In comparison, the 747-X Stretch freighter has a 64,000lbs higher payload than the 747-400F. This is for an increase in maximum take-off weight (MTOW) of 168,000lbs. The A3XX-100F's MTOW is 242,000lbs more than that of the 747-X Stretch.

The A3XX-100F and 747-X Stretch have similar volumetric payloads because of their similar containerised volume capacity. At a packing density of 7lbs per cubic foot, the A3XX-100F has a volumetric payload of 223,937lbs, and the 747-X Stretch, 232,169 lbs. The 747-X's volumetric payload is thus actually higher, because it has a larger containerised volume. This is despite the A3XX-100 having the advantage of a third upper deck for increased container capacity.

The container and pallet configurations of the A3XX-100F, 747-X Stretch and 747-400F are summarised *(see table, this page)*. While the A3XX-100 uniquely has an upper deck, its main deck provides an 8,000 cubic feet smaller containerised volume than that of the 747-X. This is because the A3XX-100 has 28 8-foot high containers, compared to the 747-X's 36 10-foot high containers. The 747-X Stretch is longer than the A3XX-100F by seven metres, providing the 747 with capacity for eight more containers. The 747-X Stretch also has six more containers than the 747-400F. The A3XX-100F, therefore, also has a smaller main deck container volume than the 747-400F, by 3,700 cubic feet.

The A3XX-100F makes up for its maindeck containerised volume shortfall compared to the 747-X Stretch by its upper deck container volume. This capacity, should, however, provide the aircraft with additional capacity and an advantage.

Another cause for the A3XX-100F's smaller container volume is that its lower deck carries 36 LD-3s compared to 41 larger LD-1s by the 747-X Stretch. The 747-X's lower deck volume exceeds the A3XX's by about 2,000 cubic feet. Moreover, the A3XX-100F's lower deck volume is actually 300 cubic feet less than the 747-400F's *(see table, this page)*.

The A3XX-100F thus has a container volume of 31,991 cubic feet, compared to the 747-X Stretch's 33,167 cubic feet. The 747-400F has a volume of 26,947 cubic feet.

The A3XX-100F makes up for some of its main deck and lower deck shortfalls compared to the 747-X Stretch with its upper deck. This upper volume is not enough, however, to completely overcome the shortfalls, and the A3XX-100F has a 1,176 cubic feet smaller containerised volume.

A3XX-100F, 747-X STRETCH F & 747-400F PAYLOAD DATA

Aircraft type	A3XX-100F	747-X Stretch F	747-400F
MZFW (lbs)	879,000	760,000	610,000
OEW (lbs)	548,000	446,600	361,100
APS additions (lbs)	530	530	530
APS (lbs)	548,530	447,130	361,630
Maximum structural payload (lbs)	330,470	312,870	248,370
Upper deck			
Container type	Pallet	N/A	N/A
Container size	96 x 125 x 82		
Number	17		
Total volume (cu ft)	9,095		
Total tare (lbs)	4,420		
Main deck			
Container type	Pallet	Pallet	Pallet
Container size	96 x 125 x 96	96 x 125 x 118	96 x 125 x 118
Number	28	36	30
Total volume (cu ft)	17,640	25,817	21,347
Total tare (lbs)	7,728	10,800	9,000
Lower deck			
Container type	LD-3	LD-1	LD-1
Number	36	42	32
Total volume (cu ft)	5,256	7,350	5,600
Total tare (lbs)	7,740	8,400	6,400
Total aircraft			
Container volume	31,991	33,167	26,947
Tare weight	19,888	19,200	15,400
Net structural payload (lbs)	310,582	293,670	232,970
Volumetric payload @ 7lbs/(cu ft)	223,937	232,169	188,629