

and 11.8 lb/h.p., which means that the take-off to clear the standard 50-ft hurdle would be somewhere within the 5,000-5,500ft length, or roughly one mile.) Under these operational conditions, then, our range-finder indicates a maximum (still-air) range of 2,260 miles, which, allowing for the drag penalty of the pack, checks out reasonably well with the publicized range of 2,400 miles for the C-119 with full tankage and gross weight of 74,000 lb.

Speed and climb performance of the XC-120 has not been officially released, but a fairly close estimate can be computed by comparison with the C-119 which, at 74,000 lb, is reported to have a top speed of 258 m.p.h. at 18,000ft. If the Wasp Major R-4360-20 model develops 2,300 b.h.p. at that height (including ram-pressure height increment), the minimum parasite drag coefficient comes through the mill with an approximate value of 0.026. Pushing this figure up to 0.028 for the larger pack-type fuselage of the XC-120, and adjusting the span, parasite and thrust-power loading parameters for a gross weight of 77,000 lb, results in a top speed of 245 m.p.h. at 18,000ft. Landing speed at a final landing weight of 60,000 lb, with near-empty tanks, should be around 90 m.p.h. Initial climb off the ground is estimated to fall within 1,000-1,100ft/min and the full-load service ceiling should reach a comfortable 22,000ft.

The elongated canister-type passenger fuselage converted for cargo carrying has lately come in for considerable criticism by the U.S. Military Air Transport Service, and these same logistics experts see in the detachable pack aircraft a highly promising line of development. They believe that the pack technique applied to the right kind of airframe layout is the logical aeronautical extension of the highway trailer and its truck tractor and the split-cargo-load compartment in the railway freight business. To summarize, they see in the Pack-plane principle the following possibilities: (1) reducing the number of aircraft required by the operator; (2) increasing the aircraft utilization two- or three-fold; (3) reducing the ground handling time and cost to the minimum; (4) providing flexibility of operation; and (5) providing storage and transportation space for various types of cargo and supplies.

As an engineering interpretation of a novel (and difficult) specification, the XC-120 has the earmarks of a logical design approach to the specialized cargo transport aircraft, commercial as well as military. The next obvious step, of course, is turboproping—which could lead to a further logical step along Burnelli wing-fuselage lines, since the turboprop installation with submerged engines and airscrews well forward of the aerofoil leading edge might well solve past difficulties of this once promising type and breathe fresh life (and air) into it. Later still, perhaps, the tail booms with their appendage will disappear down the evolutionary road like the guinea-pig's tail.

This cut-away drawing, showing the pack being used as a repair shop, gives an idea of the spaciousness of its interior.



Making several round trips, one Pack-plane could bring into an airhead in a combat zone several packs filled with troops and supplies, leaving the pack units to be used as field hospitals, storage shelters, command posts, radar stations, repair shops, etc. Ambulance pods, carrying wounded, could be attached for the return trip.

CARGO-CARRIER CONCEPT . . .

area and span are the same, while the power-plant comprises two Pratt and Whitney R-4360-20 Wasp Majors turning 15ft Hamilton Standard paddle-shaped four-bladed airscrews. This particular Wasp Major series develops a maximum of 3,250 b.h.p. for take-off (dry) and has a normal output of 2,650 b.h.p. at 6,000ft and 2,300 b.h.p. at 16,300ft.

Overall dimensions of the XC-120 are: wing span, 109ft 3in; length, 82ft 10in; and height, 25ft 1in. With a wing area of 1,447 sq ft, the geometric aspect ratio works out at 8.25, but the effective aspect ratio must be considerably lower by reason of the discontinuities caused by the triple effect of the central nacelle and twin tail-booms on the spanwise load distribution. The detachable cargo pack has a capacity of 2,700 cu ft and can carry up to 20,000 lb of cargo or military payload. When used as a medical unit, the pack can accommodate 36 litter patients and three attendants.

Bearing in mind the 74,000 lb gross weight now officially quoted for the C-119, the publicized gross weight of "about 64,000 lb" for the XC-120 (with similar power-plant and airframe structure, but heavier landing gear and pod) need not be taken too literally. Reminiscent of the "hare-and-hounds" paper-chase of one's youth, in which the false scent was considered fair gamesmanship (at any rate for the hare!), this sort of thing lends excitement to the sport and is excellent training for the nose as well as the eye. The false scent along the military trail is, of course, the artful art of ambiguity which masks the term "gross weight," since the "normal (or design) gross weight" is seldom the finalized "maximum take-off weight" (or "military overload weight") at which the military services will try to break the camel's back.

And so it is generally a sound rough-and-ready rule to add at least 20 per cent to the publicized gross weights of most military aircraft in the prototype stage, though in the classic example of the Boeing B-47 the latest gross weight has now reached the astonishingly high value of nearly 50 per cent above the original design figure. (S.P.C.A. please note!) However, adopting the more conservative basis of plus 20 per cent, the overload gross weight of the XC-120 at take-off is quite likely to finish up in the region of 77,000 lb. As a matter of fact, Fairchild are known to be interested in eventually turboproping the XC-120 with a pair of Allison T-40s at this figure—which seems to indicate that the structure has been stressed that high.

Anyway, according to our reading of the signs, the XC-120, operating with a crew of five at a take-off gross weight of 77,000 lb, should be capable of hauling the maximum capacity cargo load of 20,000 lb plus its full tankage of approximately 2,800 U.S. gallons—granted, of course, that first-class airfields with 6,000-ft runways are available. (At this weight, the wing and power loadings are 53.2 lb/sq ft

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