

# Boom-time for Indian aerospace?

India is all set for an aerospace boom as everything needed is present, except a wider appreciation of the broad spectrum capability we have built up and of the special window of opportunity we now have, says **Roddam Narasimha**

**N**OT long ago, *Aerospace America* noted in a review of Asian aerospace that 'India is emerging as the region's most powerful aircraft manufacturing nation'. The widely read US weekly, *Aviation Week and Space Technology*, lauded India for running its successful space programme 'on a shoe-string budget'. So, has India arrived on the global aerospace scene?

Not quite yet, I am afraid, but few realise how close we are. Watching the fourth air show held so professionally in Bangalore, and the visibly increasing presence of Indian aerospace products there and elsewhere, one cannot avoid the thought that Indian aerospace is now far more mature than many think.

Consider these facts. Hindustan Aeronautics Limited (HAL) has produced a total of 23 types of aircraft, of which 11 are Indian designs. Dhruv, the multi-role, multi-mission medium range helicopter, has no rival in its class from anywhere else in the world just now. The LCA is likely to be the most affordable high performance supersonic fighter in the world when it gets into production. Its projected fly-away cost is Rs 85 crore, less than \$17 million (as against \$30 million for the Swedish Gripen, the most nearly comparable aircraft in the world today). The country's first civil transport aircraft, Saras, rolled out on 4 February. HAL's intermediate jet trainer HJT-36 has successfully completed its inaugural test flight and is projected to enter service as early as 2005. ISRO has tested four satellite launch vehicles, of which the PSLV has graduated to a reliable workhorse. A total of 35 Indian satellites have been launched, of which 16 are from Indian launch vehicles; four more satellites have been launched from India for foreign customers.

The breadth of this programme would be remarkable anywhere in the world. China has bigger missiles and launch vehicles, Brazil has a more vigorous civil aircraft industry, Israel has some fancy technologies, but none of these covers as broad a spectrum as India does.



Indian aeronautical programmes have, of course, usually taken very much longer than projected. These delays have been occasioned by such diverse factors as US sanctions and delays in decision-making, but primarily by the hard slog demanded by the harsh realities of indigenous technology development. But the net result of this long drawn-out process has been that we find ourselves now with an unusually sound base of research, development, design and manufacture in the country. The Saras and the HJT projects are being rolled out in the order of two years after funding, precisely because of that solid foundation.

Indian capabilities, like Indian products, are now spread across the board. Such advanced technologies as the use of carbon fibre composites, modern control system analysis and design, computational fluid dynamics, CAD-CAM techniques, radar technologies, mission computers and many others have now been mastered by one or more laboratories in the country. India makes some of the largest solid boosters in the world, uses liquid propulsion systems extensively and is on the threshold of making its own cryo

rockets. And Dr K Kasturirangan, chairman of ISRO, has estimated that advanced technology products that need high man-power inputs can be made in India at 60-70% of the global price.

**A**LMOST all the ingredients needed for a boom are now in place, but the temptation to draw a false analogy with the IT boom will have to be resisted. The IT boom occurred without the benefit (or, as many would say, the death-kiss) of government planning. IT is highly diversified, is driven by civilian commerce and has prospered on software business startups that needed little initial investment. Aerospace on the other hand will not witness a boom without the will of the State. It requires huge resources, both hardware and software are crucial, civilian and military applications will benefit from synergy and there is little technology in the private, commercial sector.

The first decision will have to be about the ALH and the LCA. If India is to track a rising trajectory in aerospace, we will have to make these two products in large numbers — at least 200, preferably 300. If

today the government were to announce that it intends to acquire a total of 300 Dhruvs (say, for all the three Services combined and for other public sector units), the effect on the Indian aerospace industry will be electrifying, the boom will be safely on its way. If we can announce large orders for foreign products, why not for Indian ones?

R&D and industry also have to be able to define projects with development times of the order of five to eight years, instead of the 20-year durations that have become the norm. Such timeframes require a totally different kind of decision-making process, and would have to involve private enterprise within India and, in some cases, abroad. Indian aerospace products now have no global brand equity, and the best way to acquire it quickly, especially in the highly sensitive aerospace market, is to team up with international companies that already have it. Furthermore, selling abroad is a complex business: better technology is necessary but not sufficient, and financial arrangements, product support mechanisms, market presence are all factors that can have a decisive influence on eventual success — the private sector should be able to do that better.

All of this argues for more 'Indo-X' products, where X can be a suitable brand owner from elsewhere in the world, especially where export is a serious possibility. From this point of view the Brahmos cruise missile, and the agreement that has been signed between HAL and Israel Aircraft Industries regarding new avionics for the ALH and marketing help abroad, seem to be the right direction to pursue.

I believe India is all set for an aerospace boom as everything needed is present, except a wider appreciation of the broad-spectrum capability the country has built up and of the special window of opportunity we now have, and the will of the State and the technological community.

*(The author, a former director of the National Aerospace Laboratories, now heads the National Institute of Advanced Studies, Bangalore)*