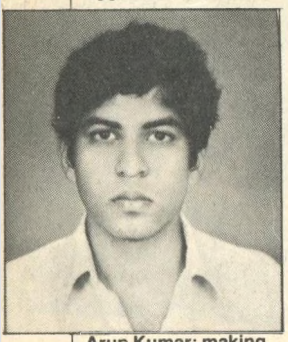
SPACE INDUSTRY

A hi-tech spinoff

The Indian Space Research Organisation has begun to transfer advanced technology to the commercial sector

It is a high-profile, hi-tech organisation packed with some of the finest scientific and technical minds in the country. In keeping with its glamorous profile, the Indian Space Research Organisation (ISRO) has a generous budget (Rs 300 crores in 1987). It is only at times of crucial failures—like the ASLV launch vehicle which plunged into the Bay of Bengal last week—that the space agency has to battle criticism that it is an unnecessary drain on the economy.

But ISRO is trying hard to prove that it isn't. And it need not be. Space programmes in the West, especially in the US, have yielded spectacular dividends, not only from their direct applications, but from the spinoffs of technology developed in the space industry.



Arun Kumar: making magnifiers

Take Teflon for instance. The non-stick coating on ordinary frying pans was first developed by Dupont for NASA, the US space agency, ten years ago. It is no longer needed for space vehicles.

Technology transfer is the name of the game. ISRO has joined in as a full-fledged player. Its technology transfer cell, tentatively set up in 1982 to institutionalise the concept, is finally scoring goals. Last year, a record 25 technologies that came off ISRO's labs found their way into Indian industry. With that, the total number of products and processes transferred has gone up to 133, with another 126 in the pipeline. The cell already has 65 licencees, 45 of whom are in the private sector, mainly in the small-scale segment. ISRO is rather proud. Anxious not to seem wasteful, it has calculated that nearly half of its budget flows back into the Indian industrial sector through efforts such as technology transfer.

"The technology transfer cell," says P. Sudarshan, who until very recently was its chairman, "was set up with the philosophy that large government R and D organisations, which are funded publicly, would develop technologies that have a potential far beyond their immediate purpose, and that to lock these up would mean not exploiting their full benefit to industry." So the cell took upon itself the mandate of delivering the knowhow developed at ISRO and affiliated agencies such as the National Remote Sensing Authority (NRSA) to Indian entrepreneurs. At first, their budget was small, but their enthusiasm was high.

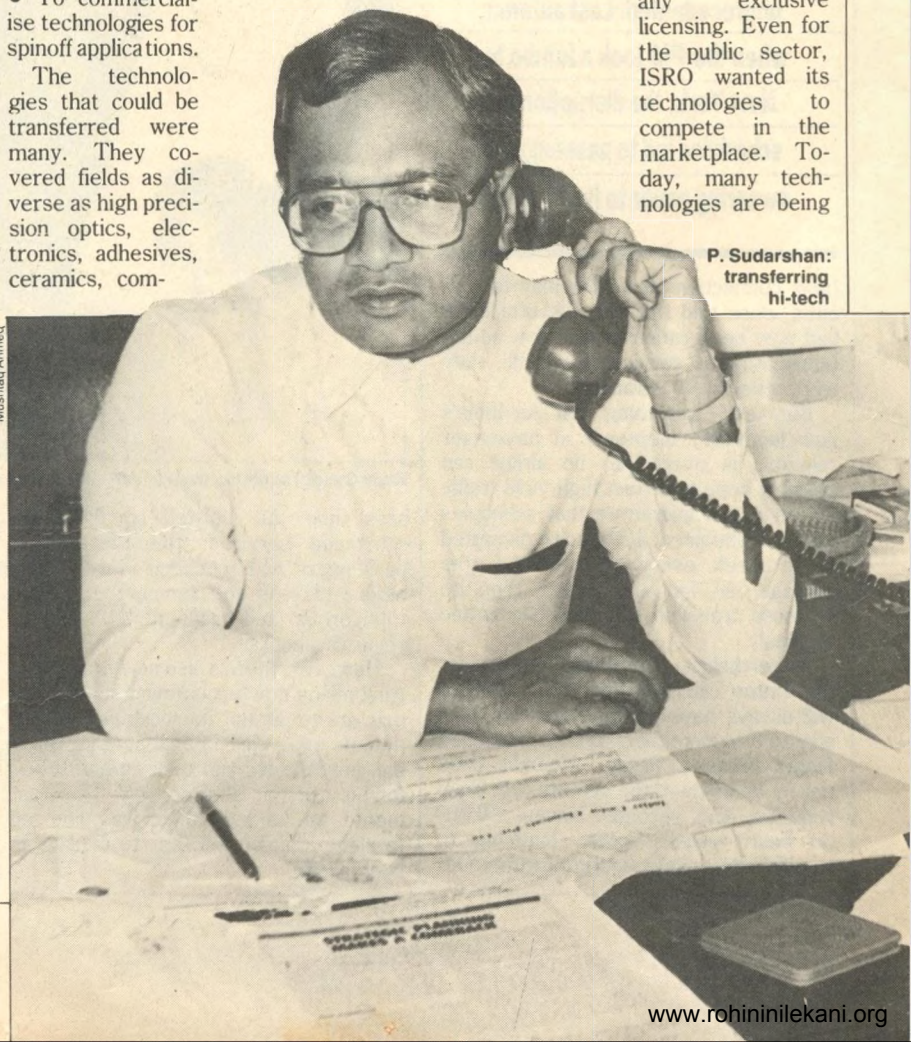
They had three goals:

- To meet requirements of the space programme's own projects by buying back products made from transferred knowhow.
- To service the rapidly growing space applications market (remote sensing for geological purposes, television, radio broadcasting, etc.)
- To commercialise technologies for spinoff applications.

The technologies that could be transferred were many. They covered fields as diverse as high precision optics, electronics, adhesives, ceramics, computer software, television hardware and so on. What the technology transfer cell had to do was identify the product and process, target it at a particular industry, and invite applicants for sharing the technology for its commercialisation. It made the offer attractive. "In many cases," says Sudarshan, "we helped a prospective entrepreneur right from market surveys through institutional financing and product launch."

And ISRO's technology was going cheap. One of its licencees, Hind Hi Vacuum of Bangalore, paid only Rs 15,000 for infra-red coating knowhow. "No one can complain about the price," says the company's managing director, S.V. Narasaiah. The idea was that since the technology was developed through public money, it should go back to the public. But the technology transfer cell had to be very careful in the way it went about transferring technology. After all, these were new products, never before launched in the country. There was no existing market. "We wanted market development to take place through our licencees," says Sudarshan.

ISRO made sure they did not flood the market at once. "We wanted the licencees to compete, not kill each other," he says. Yet there was never any exclusive licensing. Even for the public sector, ISRO wanted its technologies to compete in the marketplace. Today, many technologies are being



P. Sudarshan: transferring hi-tech

Mushtaq Ahmed

marketed by two or even three licencees at once. ISRO's microprocessor based real time system for data collection is one example.

Most of the technologies transferred by ISRO are very specialised and very hi-tech. Yet a few have trickled down into the consumer sector. A pride of place goes to its internationally patented 'Isropols'. These are unique, indigenously developed polyols made from castor oil, and can be used in the insulationfoam of refrigerators, in bicycles and in all applications of polyurethene. Isropols are not quite as popular as the Teflon spinoff, yet. But for the tech transfer team, it is one of their biggest successes. So far, only Malabar Polyols and Malabar Products Ltd, a joint sector unit promoted by Karnataka State Industrial Development Corporation (KSIDC), has been licensed for the polyols. But because of its tremendous potential other licencees will soon be created.

ISRO's technology transfer has not always been a success story, of course. Its primary drawback is that there is no market for the products and the processes it has developed. Narasaiah's company, for instance, bought the technology to manufacture radio spectrophotometers from ISRO. These can be very useful in remote sensing. But, he says, hardly any of the educational institutions in the country have facilities to use the product. So his only reliable customer is ISRO. But that is not enough to sustain a business, as is the case with the second purchase he made from ISRO's technology shelf.

Narasaiah went in for the technology because he has a coating lab, knowing fully well that there was no immediate market. In fact he is not producing anything based on the technology right now. He is one of the few Indian entrepreneurs who is willing to take the risk of waiting for a market to open up. "As a manufacturer, I am interested in future technologies," he says. "If not today, the spinoffs may come later." Narasaiah feels that ISRO's efforts, however creditable, are not immediately useful. "We talk of the supersonic age, but we are still stuck with bullock carts," he says. "We have failed to create the necessary base in India. We are not at all geared for using the offshoots of space technology."

Sudarshan admits that there have been other setbacks as well. Sometimes ISRO's licencees were not too serious about production at all. "And we compounded the folly in such cases," admits Sudarshan. "When a unit was failing, we kept trying to make it succeed, losing both time and money." Another drawback was that many licencees remained content with ISRO's buyback offers. They made no effort to commercialise any spinoff products. Sudarshan feels that one of the avenues for the ISRO licencees who cannot find a domestic market, is to look for export possibilities, especially in the Third World. But Narasaiah and others are very sceptical about this. "Judging by the quality of our goods, I don't believe that there is an export market," he says. "Even the Third World countries want to buy only the best from the first world."

Most of the ISRO technologies are very hi-tech. But some have trickled down to the consumer sector. A pride of place goes to its internationally patented 'Isropols', which are indigenously developed polyols made from castor oil

If not for export, ISRO technologies have brought about, at least in some cases, import substitution. Dynascan Inspection Systems, a small-scale unit in Bangalore, is one example. They make illuminating magnifiers, used by ISRO for remote sensing, and by the engineering industry for quality control, etc. Although there was no formal transfer of technology to Dynascan, ISRO helped them to perfect their magnifier for its own specifications. And in addition to a buyback commitment, ISRO, and especially Sudarshan's team, helped Dynascan's Arun Kumar find other buyers for the magnifiers. They put his name on their producers' list, which is regularly circulated to potential markets. "They are good at liaising between users and manufacturers," says Arun Kumar. Now, about half of Dynascan's magnifiers are sold to industrial customers like MICO, the spark plugs leaders.

But how much of ISRO's technology is really indigenous? Where does one draw the line that makes a commonly used technology 'Indian'? It is very hard to say. "All technology is really only incremental," says Sudarshan. "And if you ask me what has been the great Indian leap forward, I would say we can't claim anything great." But Sudarshan thinks this is a period of such tremendous transition, that it is enough if we just catch up. "Today, with urban services being the main demanding post for few technologies," he says, "the time between the origin of an idea, its labwork and its reaching the market has reduced in the West to about a couple of years." In India, of course, the lag is much wider. National research labs are only just emerging from their Brahminical attitude to research."

ISRO's technology transfer cell was set up specifically to counter that. Even if its success has been limited, credit must go to its team for its efforts.

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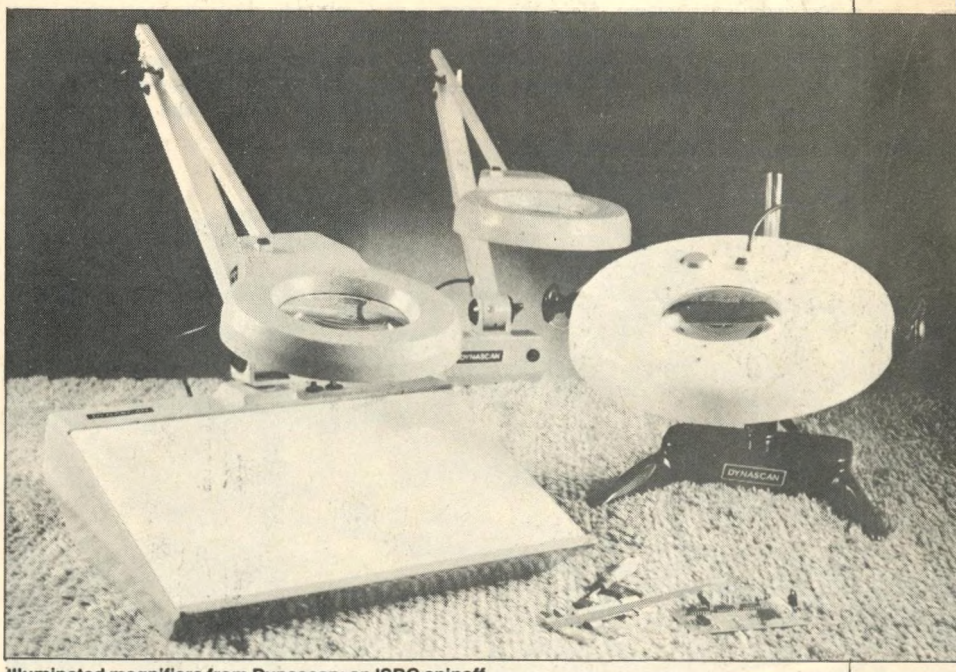

Illuminated magnifiers from Dynascan: an ISRO spinoff