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Report on the civil aviation sector
in India : airlines/air taxis,
flight training, corporate
aircraft, aerospace industry.
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REPORT ON THE CIVIL AVIATION SECTOR IN INDIA

**AIRLINES/AIR TAXIS
FLIGHT TRAINING
CORPORATE AIRCRAFT
AEROSPACE INDUSTRY**

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EXECUTIVE SUMMARY

This report was commissioned and researched for the Canadian High Commission, New Delhi, by Nick Daniel, a private aviation consultant, and Fairwood Consultants Limited in March-June 1993. Concurrent reports have also been prepared on the airports and military aviation sectors in India. Together, the three reports provide a comprehensive overview of the Indian aviation sector. It is hoped that these reports will provide the Canadian aerospace industry with an introduction to the Indian aviation sector and an indication of the market potential that exists.

Since July 1991, the Government of India has pursued a program of economic liberalization. This has unleashed Indian industry and made India a more open place to do business. Canadian business has already begun to take advantage of liberalization. In 1992, Canadian exports to India were up 75% (48% when a large wheat sale is discounted) and Canadian companies entered into 22 technology transfer or joint venture agreements.

The aviation sector is not immune to the liberalization process. In fact, for India to take full advantage of its economic reforms and more closely integrate itself into the world economy, it must expand and modernize its transportation, telecommunication and power infrastructure. While many regulatory hurdles still exist, the aviation industry is one of the fastest growing and more dynamic sectors of the Indian economy. It offers excellent potential for Canadian exports and for collaboration with Indian partners.

Citing economic liberalization, the rapidly changing business climate, the burgeoning middle class, affluent overseas Indians, and the Government's thrust on tourism, the International Air Transport Association (IATA), in its latest report "Air Traveller Forecast: Air Visitor Arrivals in Key Asian Countries: 1981-2010", has projected that international arrivals to India will increase by 7.2% annually over the next decade. Studies carried out by the International Airports Authority of India and Arthur Anderson have reported findings similar to that of the IATA report, indicating annual growth rates of 9% and 12% respectively for international and domestic passenger traffic.

To meet this increasing passenger demand, India's four national carriers have all drawn up fleet expansion plans. Air-India is taking delivery of four Boeing 747-400s in the next year, and plans to add another 10 medium capacity long-range aircraft by the end of the decade. Indian Airlines is in the process of taking delivery of 12 Airbus A-320s, and plans, based on 8% annual traffic growth, to increase its fleet from 52 to 175 by the year 2010. Both of these airlines have established fleet renewal plans that will see aircraft replaced after 10 and 15 years service respectively. Vayudoot, which was merged into Indian Airlines in May, is in the process of selecting a new 50-seat regional airliner to replace its aging fleet. The immediate requirement is for 10-12 aircraft. Pawan Hans has recently purchased a Bell 206B Longranger helicopter and has issued a tender to lease five MI-8 and MI-17 helicopters. Pawan Hans fleet of 19 Dauphin SA-356N helicopters will likely need to be replaced in five years.

Yet, the growth in the civil aviation sector has not been confined to the national carriers. Since the Government of India announced an Open Sky policy in April 1990, the private sector has become actively involved in civil aviation in India. In the past two years, 11 private airlines have commenced operations. While five have since closed down their operations, six, led by East West Airlines, continue to become more firmly established, and three more have announced plans to start operations in 1993. In the first two years of operations, the private airlines have been able to carve out a 10% share of domestic passenger traffic. Some are now entering the cargo market and two have obtained landing rights in Gulf countries and are waiting for approval from the Indian Government to operate on these routes. Current expansion plans of the private airlines are to increase their fleets from around 25 to about 45 aircraft within the next year. Most analysts believe that, at the most, three or four private airlines will survive, with the others folding or being amalgamated with the survivors.

The situation for private airlines is, however, still uncertain. Until the Air Corporation Act of 1953 is amended, they are not legally permitted to operate scheduled services. The Government is likely to introduce legislation to enact a new Air Corporations Act in the current session of Parliament. Whatever shape the Air Corporation Act amendments take, ultimately, the Government is unlikely to be completely "hands off" with the private airlines because of its concern for the national carriers. So it is to be expected that there will always be some regulation of fares, routes and the overall number of operators.

Until the civil aviation scene in India becomes more certain, the private airlines will continue to rely on leased aircraft; only Archana Airways has purchased aircraft. In fact, the private airlines are likely to put off any major expansion plans until amendments are made to the Air Corporations Act to legalize their operations. The private airlines are also likely to wait until after the peak tourist season this winter to determine how they are fairing, before making expansion or purchase plans.

To date, the aircraft of choice of India's private airlines has been the 737-200. The current recession in the world airline business, coupled with the fact that the Boeing 737-200 no longer meets noise restrictions in North America and Europe, has made it quite easy for Indian private airlines to lease these aircraft at low rates. As the Indian fleet expands and the world aviation industry begins to slowly climb out of recession, availability of these aircraft is going to diminish, and leasing costs will rise. In addition, the private airlines will no longer have ready access to the supply of trained pilots, from Indian Airlines.

With the Government's new regulation of one route under 700 kms for every one over 700 kms, the private airlines will be forced to look at acquiring smaller regional aircraft, as the larger B-737s are very uneconomical on these shorter routes. An aircraft manufacturer which enters into a co-production agreement with Hindustan Aeronautics Limited, and has its aircraft selected by Vayudoot, will be in the best position to sell to the private airlines as the cost of an aircraft co-produced in India would be less and the commonality of aircraft would allow for joint maintenance.

If the anticipated growth in airline passenger traffic is realised, the indigenous airline fleet, both private and national, will certainly grow. This will require an increase in the number of trained pilots and engineers, some of whom will come from the military and some from the increased output from the training establishments.

Along with this growth will be the need for simulator training establishments for the more common aircraft types, such as the Boeing 737, as well as for newly-inducted aircraft types. There will also be a need for contracting simulator time outside the country, as well as training on new aircraft that the private operators lease. In addition to the major training facilities of Air-India and Indian Airlines, East West Airlines and The Raymond Mills have proposed to establish B-737 simulator training facilities. These developments present good opportunities for Canadian simulator companies.

For a long time now, the Indian corporate world has been used to having to fly India's national carriers, but now, with private airlines and corporate aircraft available for charter, executives are becoming used to a higher level of service and the time and cost advantages of flexible schedules. At the same time, there is a slow changing of the attitude toward the acceptance of corporate aircraft as a business tool and not simply as a luxury.

Another impetus for corporate aircraft is the international business empires being created by Indian companies which are increasing their investments overseas. To encourage this general change in corporate attitudes further there is a new generation of young managers who are no longer as willing to accept the status quo, and who are often western trained. These new managers better understand the importance of a corporate aircraft as a business tool. Currently one-third of the 100 largest business houses in India use corporate aircraft, most of which are aging. While it still remains difficult to import these aircraft into India, there is good potential.

As a result of the suppression of private airlines and corporate aircraft activity in India for 30 years or more, there are very few maintenance/service/overhaul facilities catering to the civil market, other than those of the national carriers. Air India and Indian Airlines have large and adequate maintenance facilities. They require upgrading with high-tech equipment to reduce the dependence on maintenance facilities abroad for unserviceable aircraft assemblies and parts. Although they have excess capacity, they have not, and show no signs of wanting, to take in maintenance for India's private airlines. In fact, the government has placed restrictions on "air taxi" operators use of Indian Airlines' maintenance and training facilities.

While there are a small number of maintenance companies supporting the limited number of private and corporate owners, the private airlines generally have the size of aircraft (Boeing 737) that these established maintenance companies are unaccustomed to handling. As the private airlines are not sufficiently established to set up their own maintenance facilities, the majority of the them have been forced to go abroad for their major servicing requirements, particularly C and D checks, while carrying out line maintenance on the airport terminal ramps. One exception is Jet Airways, which has contracted Air Works in Bombay to service its Boeing 737-300s.

There is no doubt that there is a great need for and great scope for maintenance and ground handling facilities in India, particularly for servicing the private airlines. The International Airports Authority of India and the National Airports Authority have both stated that they are willing to rent out space for hangars where available. However, in certain cases, Bombay in particular, there is an extreme shortage of space. In reality, therefore, the choice of facility positioning may be somewhat limited. Despite this, necessity will overcome these limitations and available space will be found. As the private airlines do not have the capital to set up ground handling infrastructure over night, there are opportunities for leasing companies to supply stairways, buses, battery carts and other equipment.

In addition to their proposed simulator facilities, East West Airlines and The Raymond Woollen Mills are also planning to set up maintenance bases in south India. Another entrant into the civil maintenance market is Hindustan Aeronautics Limited (HAL), which completed a C check of an East West Airlines B-737 in April. HAL is looking into the possibility of establishing a third party heavy maintenance base in collaboration with Air-India. Based in Bombay, this facility is proposed to compete with similar facilities in Hong Kong and Singapore.

Civil aviation facilities today do not meet even the fringe of India's needs. Besides meeting its own needs, India may in due course emerge as a base for serving the needs of South Asia and other countries elsewhere in Asia. Existing and proposed facilities will serve the requirements of civil and defence aviation where commonalities exist.

The shift to civil aviation by HAL and many other Indian aerospace companies comes as a result of decreased defence spending. HAL is seeking collaboration from foreign industry for co-production, production under license, joint ventures and other technical tie ups. The projects of current interest are: the Advanced Light Helicopter; the Light Combat Aircraft; a 50/70-seat regional aircraft and engines; trainer aircraft; and avionics and accessories. Exports to third country markets are a major thrust area for the Indian aerospace industry. Canadian aviation equipment manufacturers seriously interested in this market will likely have to consider joint ventures, licensing agreements and technology transfers to take full advantage of opportunities in India.

The aerospace sector in India is changing quickly. Many development projects in the civil aviation sector, which had been kept on hold because of financial constraints and low priority, are now being revived. Yet, because of resource constraints in India, a financial package including a loan or deferred payment will make any offer more attractive. The Indian market requires long and sustained marketing with vigorous follow up. To be successful on global tenders, Canadian companies should have a permanent local presence, either through a representative office or an appointed agent. For advice on establishing a local office or selecting an agent, contact the Canadian High Commission, New Delhi, or the Consulate of Canada, Bombay. Key aviation sector contacts are listed in Appendix R.

The aerospace sector is still largely in the public sector, and as such, companies will need to take a patient attitude as the wheels of government move slowly (see Appendix Q for Government Procurement and Tendering Practices). Nevertheless, there is a burgeoning private sector, which is much more dynamic. British, French and American, as well as Russian, aerospace companies have been active in the market. In the past, the Canadian aerospace industry has not been aggressive enough in its marketing efforts. Now is the time to investigate this market.

The Canadian industry enjoys an excellent reputation for its product quality and service standards, with Canadian Otters and Caribous still held in high esteem. From an Indian perspective, the strength of the Canadian aerospace industry is perceived to lie in aircraft simulators, ATC radar, navigational aids, ground handling equipment and transport planes.

The first real opportunity to get a first hand view of the Indian aviation sector is at the second AVIA India Airshow, which will be held December 15-18, 1993 in Bangalore. This show provides the best opportunity for Canadian companies to meet Indian companies, government officials, and agents involved in the airports, aviation and aerospace sector. AVIA India is being organized by Convex, in cooperation with Hindustan Aeronautics Limited. For further details on AVIA India, contact Ms. Puspa Nair, Convex, 14-F Basant Lok, Vasant Vihar, New Delhi-110 057. Tel: (91-11) 67-0346, 60-7582, Fax: (91-11) 687-5598, Tlx: 031-82031.

PART I — AIRLINES/AIR TAXIS

HISTORY OF CIVIL AVIATION IN INDIA

The Indian civil aviation sector was nationalised in the 1953 with the passage of the Air Corporation Act, 1953, which enabled the Government of India to acquire all existing airlines to form two national airlines. Air-India, the international flag carrier, began in 1932 as Tata Airlines. It now operates 22 aircraft to 40 destinations, and was ranked by IATA as the 41st largest international airline 1991. Indian Airlines, the domestic carrier, began in 1953. It now operates 52 aircraft to 65 destinations, and was ranked by IATA as the 17th largest domestic airline in 1991. Throughout the 1960s and 1970s, under successive socialist inspired governments, the private sector was prevented from entering the airline or charter business, and was not encouraged to expand into corporate or private flying, or flight training.

In 1981, the Government created Vayudoot, a third level feeder airline, principally to service outlying areas in northeastern India. Vayudoot did not adhere to this mandate and began to add populous areas to its service, evolving into an airline operating in wide-ranging regions, lacking cohesion and incurring mounting financial losses. At its peak, Vayudoot served 105 destinations and was touted by its then Chairman to be the world's fastest growing airline. By 1992, Vayudoot had reduced its destinations to 35, and in May 1993, it was merged with Indian Airlines.

The fourth national carrier, Pawan Hans, was originally established in October 1985 as the Helicopter Corporation of India Limited. It now operates 22 helicopters on a charter basis, primarily for the Oil and Natural Gas Commission.

The mid-1980s saw subtle changes take place in the Government's attitude to civil aviation. While Indian Airlines and Vayudoot had established a very comprehensive domestic network, they had an unfortunate service record, in particular with "on-time" scheduling and customer handling. This was perhaps noted most easily by foreign visitors and Indians who had travelled abroad. In 1986, Prime Minister Rajiv Gandhi, who was himself a former Indian Airlines pilot, suggested that his government look at allowing the private sector to operate "air taxis", aimed at the business and tourist passenger markets. This suggestion eventually came into being in April 1990 under the "Open Sky" policy. These airborne taxis were to augment and complement Indian Airlines and Vayudoot operations. By mid-1993, six private airlines and another five private air charter companies were operating under air taxi permits.

Since 1988, many ad hoc decisions have been taken, which have liberalized air taxi operations. However, the Air Corporations Act, 1953 still remains in effect. This Act does not permit private industry to operate "scheduled" air services. So, private airlines are technically licensed as non-scheduled, or "air taxi", operators. Since May 1992, a bill has been pending to amend the Air Corporations Act.

Over 35 foreign carriers currently operate air services to and through India. In addition, twenty foreign airlines have received permission to overfly Indian territory. The on-line carriers are listed in Appendix A.

MINISTRY OF CIVIL AVIATION

As in most countries, civil aviation in India is a federal responsibility. The Central Government, through the Ministry of Civil Aviation and Tourism, frames policy guidelines and exercises executive control. Since civil aviation and tourism depend on each other, India has a composite Ministry of Civil Aviation and Tourism. The current Minister, Mr. Ghulam Nabi Azad, took office on January 18, 1993. The Ministry's organisation chart and a brief description of the organisations under its administrative control are included in Appendix B.

DIRECTORATE GENERAL OF CIVIL AVIATION (DGCA)

The DGCA is responsible for regulation of air transport services to, from and within India, and for enforcement of civil air regulations, air safety and airworthiness. It is headed by the Director General of Civil Aviation, an ex-officio Additional Secretary in the Ministry of Civil Aviation. The organisation chart of the DGCA and a brief description of its functions are included in Appendix C.

AIR CORPORATIONS ACT

There is a pending bill to amend to The Air Corporation Act, 1953. The government had intended to introduce this bill in May 1992, and is now likely to present it during the current session of Parliament. The two principal features of the bill are to make Air-India and Indian Airlines limited liability corporations (a possible first step to privatization), and to legalize the scheduled operations of private airlines.

Since May 1992, there has been a rethinking leading to major revisions in the Bill. One of the Ministry of Civil Aviation's top priorities is to restore the profitability of Indian Airlines and to prevent the exodus of trained pilots and engineers to private airlines. The Government may, therefore, include measures to restrict competition on the major trunk routes and provide incentives to private airlines to operate on the shorter regional routes. With mounting pressure on the Government to clarify civil aviation regulations, the amendment of the Air Corporation Act cannot be unduly delayed. It is possible though, that amendments to the Act will be introduced in instalments, while privatization will be kept on hold. Details of the Air Corporations Act, 1953 are included in Appendix D.

NATIONAL CARRIERS

Until the recent merger of Vayudoot with Indian Airlines, India had four state-owned national carriers. Air-India, based in Bombay, is India's international flag carrier. Indian Airlines, based in New Delhi, is the main domestic carrier, as well as operating flights to neighbouring countries. Vayudoot, based in New Delhi, provides feeder services to remote areas within the country. It is now merged with Indian Airlines. Pawan Hans, based in New Delhi, operates helicopter services. A brief overview of the operations of the four national carriers is given below.

AIR-INDIA

Air-India got its start in 1932 as Tata Airlines with a single de Havilland Puss Moth. Air-India emerged in its present form in 1953, when, with the nationalization of India's airlines under the Air Corporations Act, Air-India became the country's flag carrier. Its Corporate Headquarters are in Bombay. Over the past year, there has been considerable talk of a merger with Indian Airlines (see Merger under Airline Management Issues for details). Contact information for Air-India is included in Appendix E.

Performance and Financial Summary

In 1992-93, Air-India's net worth increased to almost Rs. 10 billion from Rs. 7 billion the previous year¹. In 1992-93, the corporation earned its highest-ever total revenue of Rs. 25.6 billion and net profit of Rs. 3.01 billion, surpassing the record 1991-92 revenues of Rs. 20.73 billion and net profit of Rs. 1.46 billion. This is significant when you consider that during these same two years most of the world's international airlines were in the red. Air-India's financial performance could have been even better in 1992-93, except a flight engineers' strike starting on February 27, 1993 and lasting 56 days, caused a revenue loss of Rs. one billion. The load factor of the airline increased from 58.5% in 1991-92 to almost 65% in 1992-93. In addition, in 1992-93, Air-India earned Rs. 2.7 billion in revenue from its cargo operations and projects that it will earn Rs. 3.4 billion from these operations in 1993-94.

Air-India's financial outlay under the Government's Eighth Five Year Plan (1992-93 to 1996-97) has been revised upwards to Rs. 23.75 billion, mainly for aircraft loan repayments. Non-plan expenditures of Rs. 3.95 billion are projected for support services such as workshop equipment, ground support facilities, buildings, computers and communication facilities.

Maintenance Facilities

Air India is largely self-sufficient in maintenance and overhaul of its aircraft. Spread over almost 40 acres, its principal maintenance base in Bombay is capable of handling complete work on its fleet of Boeing 747-200 and 747-300, Airbus A-310-300 and A-300B4 aircraft. Apart from line and heavy maintenance, Air-India is also capable of handling major structural modifications and painting wide body aircraft. There is also a Jet Centre in Bombay for repairs, overhauls and tests of Pratt & Whitney JT8D and JT9D, General Electric CF6-50-C/C2 and CF6-80CW engines. Air-India is also planning to set up an overhaul facility for PW-4056 engines to be installed on its newly acquired B747-400 aircraft. Air-India also has a maintenance facility in

¹ At the time of printing the Canadian Dollar was worth 24 Rupees.

New Delhi. Air-India is looking into the possibility of establishing a third party heavy maintenance facility in collaboration with Hindustan Aeronautics Limited (see Maintenance of Civil Aircraft for details).

Fleet

Air-India's fleet consists of 22 aircraft: 9 x Boeing 747-200, 3 x Airbus A300-B4, 8 x Airbus A310-300, and 2 x Boeing 747-300 Combi. In addition, Air-India has wet-leased one IL-62M aircraft from Aeroflot for its Moscow operations and one IL-76 freighter from Aeroflot for freighter operations on the India/Moscow/Zurich route. It has also leased one DC-8 for its Madras/New York cargo route. The corporation is investing Rs. 19.03 billion to acquire four Boeing 747-400 aircraft. Air-India will take delivery of the first aircraft in August 1993. It is scheduled to receive the second in November 1993, the third in December 1993 and the fourth in June 1994. It plans to convert its A-300s into freighters. Air-India is carrying out a survey to select a medium capacity (250-seat) aircraft with long range intercontinental capability, for which it is said to be evaluating the A-340, the MD-11, and the B-767X. Air-India is planning to add 10 more long range aircraft by the end of the decade. Boeing, which is trying to persuade Air-India to purchase the B-777, predicts that the Indian aviation market could spend as much as US\$ 7 billion over the next decade to meet rising air traffic demands. In order to have a younger and more modern fleet, Air-India has drawn up a long term fleet renewal plan which envisages replacement of aircraft after 10 years instead of the current standard of 20 years.

Routes

Air-India operates scheduled passenger services to the following destinations (frequencies per week are given in brackets): USA (7), Toronto, Canada (2), London (2), Europe (8), Japan (6), Singapore (10), Gulf countries (57), Moscow (2), East Africa (3), Thailand (2); and freighter operations - India/Moscow/Zurich (2), and Madras/New York (1).

Air India plans to introduce flights to South Africa, Scandinavia, Philippines and Indonesia in the near future. Later it intends to fly through China and Japan to the west coast of the USA, and through Spain to South America. Before the end of the decade it intends to fly the Trans-Polar route to the USA west coast.

INDIAN AIRLINES

Indian Airlines, like Air-India, was set up under the Air Corporations Act, 1953. Primarily a passenger airline, its main objective is to provide safe, efficient, adequate, economical and properly co-ordinated air transport services. Its Corporate Headquarters are in New Delhi. It has four Regional Offices located in Bombay, Calcutta, Delhi and Madras.

In May 1993, Mr. L. Vasudev, resigned as Chairman of Indian Airlines. Mr. Brijesh Kumar, Joint Secretary, Ministry of Civil Aviation, has been given the additional responsibility of heading the airline until a new Chairman is appointed. Indian Airlines has been known for its inability to maintain on-time departures, its indifferent service and labour unrest. It currently has over 22,000 employees. The most recent labour incident was a 46-day strike by its pilots from December 10, 1992 to January 24, 1993, which cost the airline Rs. 466 million. The emergence of significant private sector competition, primarily on the major trunk routes, is forcing Indian Airlines to improve its performance, service and labour relations. In response to competition from private airlines, Indian Airlines has announced that it will soon provide business class service in its A-320 aircraft. In the last year, 101 pilots, 40 engineers and 12 instructors have left Indian Airlines, mostly to join one of the private sector airlines. Indian Airlines requires 100 commanders for its twenty A-320 aircraft and 95 for its B-737s, for which it respectively has only 67 and 46 pilots. In July 1993, 40 of Indian Airlines' 70 pilots in the southern region sought no objection certificates to leave the airline. As the demands leading to the December 1992 strike have not yet been addressed, there has been talk of another strike in December 1993. Contact information for Indian Airlines is included in Appendix F.

Performance and Financial Summary

On March 31, 1991, Indian Airlines' capital stood at Rs. 1.05 billion, out of which Rs. 549.2 million was equity capital and Rs. 500.4 million was loan capital. The financial results for the year 1991-92 show an operating profit of Rs. 183.28 million and an overall before tax loss of Rs. 1.99 billion, compared to the previous year's operating profit of Rs. 507.7 million and before tax loss of Rs. 643.9 million. This continues a steady downward trend from a peak operating profit of Rs. 1.06 billion and before tax profit of Rs. 756 million in 1987-88. Preliminary estimates for 1992-93, project that Indian Airlines had a before tax loss of Rs. 1.5 to 2.1 billion.

Total passengers, cargo and overall load factors at Indian Airlines have experienced a similar downward trend. In 1991-92, Indian Airlines earned 88.2% of its revenue from passenger traffic and 5.8% from cargo (including excess baggage). At 8.9 million, passenger traffic was down from a high of 10.44 million in 1987-88. At 98,141 tonnes, cargo was down from a high of 129,629 tonnes in 1988-89. The overall load factor declined from 76.4% in 1988-89 to 69.8% in 1991-92. The decrease in load factor is partly explained by fact that from 1990-91 to 1991-92 capacity increased by 17.6%, while utilisation increased by only 8.9%.

Indian Airlines also provides ground handling services to a number of airlines operating to various airports in India, including PIA, Ariana Afgan Airlines, Air Lanka, Air India, Malaysian Airways, Monarch Airlines, Sterling Airways and Time Air. Handling fees earned Indian Airlines Rs. 128.3 million in 1991-92, up from Rs. 85.6 million in the previous year.

Maintenance Facilities

Maintenance of its fleet of aircraft is carried out at the four engineering bases located at Bombay, Calcutta, New Delhi and Hyderabad, which are capable of carrying out "C" Checks. Indian Airlines also undertakes maintenance work for outside organizations such as Air-India, Royal Nepal Airlines, Vayudoot, the National Airports Authority, the National Remote Sensing Agency, the Border Security Force, and the Indian Air Force. Current Government regulations prohibit Indian Airlines from offering commercial maintenance services to private airlines.

Indian Airlines has three A-320 hangars in New Delhi. In the Avionics Shop, a new ATEC Tester has been commissioned to test A-320 components. The Jet Engine Overhaul Shop does heavy maintenance on JT8D engines. Expansion of the engineering workshop hangar at Bombay, and construction of new hangars in Calcutta and Madras are in progress. There is a Fuel and Oil Testing Lab in Bombay. Indian Airlines also intends to construct engineering sub-bases at Ahmedabad, Bhubaneshwar and Guwahati for night stopping of aircraft.

Fleet

On December 31, 1992, the fleet of Indian Airlines consisted of 52 aircraft: 11 x Airbus A-300, 18 x Airbus A-320, and 23 x Boeing 737. It also has 3 Fokker F-27 aircraft, two of which have been leased to the Coast Guard and 1 to Vayudoot. After losing one B-737 in an accident in April 1993, Indian Airlines has decided to ground four 20-year old B-737s, and dispose of them during 1993-94. It will be left with twelve B-737s which are 10-15 years old and six which are 15-20 years old. In the past three years, Indian Airlines' aircraft utilization hours have dropped considerably. From 1989-90 to 1992-93 the average annual hours of its A-300 aircraft dropped from 2,901 to 2,100; A-320 from 2,080 to 1,900, and B-737 from 2,607 to 1,900.

Indian Airlines plans to augment its fleet on the basis of 8% annual growth in traffic. It has already ordered 12 additional A-320 aircraft. Two of these were received in February and March 1993, five are expected to arrive in 1993-94 and the remaining five in 1994-95. Indian Airlines has entered into a financing arrangement with a consortium of European banks for the purchase of six of the A-320s. Indian Airlines envisages a fleet size of 175 aircraft by 2010, with a mix of 100-, 150- and 300-seat aircraft, at a cost of approximately Rs. 280 billion. For a fleet of this size, Indian Airlines will require 2,000 pilots. According to the long term fleet renewal plan of Indian Airlines, after the year 2000, aircraft will be replaced after 14 to 16 years of service. This will ensure a younger and more modern fleet.

Routes

Indian Airlines has a network of 65 on-line stations. Its domestic network links 54 stations and it serves 11 stations in the neighbouring countries of Pakistan, Nepal, Sri Lanka, Maldives, Bangladesh, Afghanistan, Thailand, UAE and Singapore. During 1991-92, it operated 169 scheduled services daily. Its profitable routes are the trunk routes between Delhi, Bombay, Calcutta, Madras, Bangalore, Hyderabad and Trivandrum. On most other services it breaks even, while it operates a few unprofitable routes as a part of its social obligations.

There has been considerable discussion of an Indian Airlines merger with Air-India. While this may happen in the medium to long term, in the short term, the Government has instructed both airlines to undertake joint fleet planning and route scheduling (see Merger under Airline Management Issues for more details).

VAYUDOOT

Vayudoot was incorporated on January 20, 1981 as a company jointly owned by Air India and Indian Airlines. Its main objective was to connect inaccessible areas in India's northeast region. During its 12 years of operation, Vayudoot has sustained very heavy losses because of three reasons. First, its aircraft were aged and uneconomic to operate. Taking total costs into account, the break-even seat factor for its Avro HS-748s is 95% and for its Dornier-228s, it is 127%. Second, the airline over-extended its operations and was not able to provide reliable service, and therefore lost its credibility. Third, its overhead was too high. In the last year, Vayudoot has reduced its staff from 1,850 to 1,540. Some analysts have commented that this reduced staff size still includes 800-900 excess employees. On May 19, 1993, the Government announced the merger of Vayudoot with Indian Airlines (see below). Contact information for Vayudoots is included in Appendix G.

Performance and Financial Summary

The authorised share capital of Vayudoot is Rs. 500 million with a total subscribed capital of Rs. 359.5 million, contributed equally by Air-India and Indian Airlines. There has not been a single year in which it did not produce a loss, the amount varying from a meager Rs. 300,000 in 1983-84 to a staggering Rs. 370 million in 1991-92. It has come down to Rs. 220 million during 1992-93. Its load factor improved from 61% to 65% over the same period. The accumulated losses of the airline on March 31, 1993 were about Rs. 1.9 billion, of which Rs. 800 million is owed to Indian Airlines, Rs. 500 million to Hindustan Aeronautics Limited (HAL) and Rs. 350 million to Air-India. Over the past year, Vayudoot was trying to reduce losses by route rationalization, cost reductions, better inventory planning, better material management and reducing expenditure on aircraft maintenance by negotiating better terms.

Fleet

On December 31, 1992, Vayudoot's fleet consisted of: 8 x Avro HS-748, 8 x Dornier-228, and 1 x Fokker F-27 (on lease from Indian Airlines). All of its Avros are more than 20 years old. Currently only 7 or 8 aircraft in its entire fleet are serviceable.

On January 18, 1988 Vayudoot set up an Agro Aviation Division with the following aircraft received on transfer from the Ministry of Agriculture: 16 x Basant Helicopters and 1 x Bell Jet Ranger Helicopter. This division conducts aerial spraying operations to fight locust invasions and breeding, protect crops from pests and diseases, and undertakes aerial seeding under the Government's afforestation programme.

Routes

Vayudoot commenced operations in 1981 by providing air service to 11 stations in the northeast. It kept on extending its operations to other parts of the country and by 1989-90 had increased its coverage to 105 stations. It then reduced the number to 41 in October 1991 and to 38 in March 1993, of which 30% overlapped with Indian Airlines' route network.

Merger

The Government had hoped that by granting licences to private airlines Vayudoot's routes would be adequately served and Vayudoot operations could be wound up. Since this has not happened, the Government decided to merge Vayudoot with Indian Airlines. It is understood that the Ministry of Civil Aviation has agreed to the following merger conditions suggested by Indian Airlines:

- freezing of Vayudoot's liabilities (no new claims);
- moratorium on repayment of Vayudoot's debts of Rs. 1.90 billion for five years;
- future debt repayment in 10 annual instalments will be guaranteed by Indian Airlines;
- subsidy of Rs. 20 million every year for operations in the northeast; and
- purchase of modern fuel-efficient, 50-seat aircraft to make operations viable.

Except for the northeast, Vayudoot will only operate on commercially viable routes. The Government will subsidize Vayudoot's northeast operations to the extent of 17%. It will only operate smaller aircraft of 50-seat capacity. A six-member committee under the chairmanship of Mr. R.N. Sharma, Chairman of Hindustan Aeronautics Limited (HAL), has been appointed to select a new aircraft for Vayudoot. Its present

requirement is for 10- 12 aircraft. All its present aircraft are to be disposed of. There is a strong likelihood that in order to be selected, an aircraft manufacturer will have to reach a co-production arrangement of some sort with HAL.

PAWAN HANS

Pawan Hans is the new name of the "Helicopter Corporation of India Limited". Set up in October 1985 with the basic objective of providing helicopter support services to the oil sector in offshore exploration, it also connects inaccessible areas in the northwest, northeast and Sikkim, and contemplates a role in tourism promotion and fighting forest fires. Its Corporate Headquarters are in New Delhi. Contact information for Pawan Hans is included in Appendix H.

Performance and Financial Summary

Pawan Hans has steadily improved its net profit (excluding extraordinary adjustments) from a loss of Rs. 81.1 million in 1988-89 to a profit of Rs. 120.8 million in 1991-92. During 1991-92, 65% of its revenue was earned from its Dauphin helicopters and almost 47% from hourly charges on all helicopters. During 1991-92, Pawan Hans incurred foreign exchange costs of Rs. 65.2 million for stores, spares and consumables, Rs. 12.2 million for rotables and repairables, and Rs. 131.7 million for repair charges. For 1992-93, preliminary reports are that its operating profit jumped to Rs. 267 million, on revenue of Rs. 1.24 billion.

Fleet

Pawan Hans' fleet composition is: 19 x SA-356N Dauphin Helicopters, 3 x Mi-8 Helicopters (on lease from Aeroflot until March 1994), and 1 x Bell 206B L4 Longranger. One Mi-8 helicopter crashed recently. Pawan Hans' aging fleet of Dauphin helicopters are catching up with structural fatigue, but should not need to be replaced for another five years. The company also has 19 Westland W30 helicopters which have been grounded since February 9, 1991 because of serious complaints about their performance. A global tender open until July 31, 1993 has been issued for their disposal. In February, Pawan Hans purchased one Bell 206B L4 Longranger, with plans to acquire two more. It is also investigating the purchase of Hallard 12UE helicopters. In May 1993, Pawan Hans floated a tender for the wet lease of five MI-8 and MI-17 helicopters for operation in the northeast and at the Bombay High oil field to be operational by the end of September 1993. As Bombay High is an offshore oil field, the DGCA has questioned Pawan Hans' proposed lease of these helicopters which are not equipped with mandatory flotation bags.

Operations

In 1991-92, Pawan Hans reduced its staff from 747 to 728 employees. Pawan Hans has an Aviation Training School, with an Instrument Procedure Trainer, and a maintenance facility in Bombay, with Category "G" approval from the DGCA. Besides pilot training, the School also provides courses on Dauphin and Chetak helicopters and Arriel and Artouste engines for technicians. Pawan Hans has another maintenance base in New Delhi. Besides the main manufacturers of its helicopters, Pawan Hans sources spares from the UK, USA, Singapore, Australia and France. It has also signed repair contracts with facilities in Singapore, Australia and France.

The Company has leased out 18 helicopters on long term contracts, 15 to the Oil and Natural Gas Commission and one each to the National Thermal Power Corporation, the Lakshadweep Islands Administration and the Punjab State Government. In addition, Pawan Hans has operational and maintenance contracts for a Dauphin helicopter owned by the State Government of Madhya Pradesh and an Ecureuil helicopter owned by the Gas Authority of India Limited. The corporation has been offered a subsidy of Rs. 75.5 million per month by the Government to deploy two helicopters in northeast India to serve the interior areas beginning in September.

AIRLINE MANAGEMENT ISSUES

Two management issues concerning Air-India and Indian Airlines which have evoked public interest and generated controversy are the possibility of a merger and/or privatisation of the airlines.

MERGER

When the Government of India passed the Air Corporations Act in 1953, the thinking was that the nation should consolidate its flying resources and rationalize its route structure. Air-India and Indian Airlines

operated in different environments, had different standards and acquired different aircraft types for their fleets. However, over a period of time Indian Airlines flights to neighbouring countries have increased and Air-India has been allowed to fill seats on domestic sectors of its international routes. Since the line dividing their spheres of operation was getting blurred, the idea of merging the two airlines gained currency. Mergers are taking place the world over with the rapid formation of several mega carriers. The Government, therefore, started considering whether the two carriers should maintain their separate identities.

The proposal of a merger is not new. It was first mooted 15 years ago in 1978 when BOAC merged with BEA in the United Kingdom. The Indian Government examined the issue, but discovered no tangible benefit in a merger. Air-India had opposed the move saying that it had to compete with foreign carriers which it might not be able to do with Indian Airlines standard of customer service. It was also apprehended that the merger might create an unmanageable giant. Another move to bring the two airlines closer together was made some years later when the Government appointed a distinguished aviator, Air Chief Marshal P.C. Lal, to be the joint Chairman of the two corporations. For various reasons, the experiment did not succeed. In October 1986, the Planning Group on 'Civil Aviation at the end of the Century' revived the idea of a merger in its Report to the Government.

The main argument in favour of a merger is that it would lead to better coordination in policy formulation and control. Economies could also be achieved with integration of technical facilities, interlining of international traffic with domestic, establishment of common training facilities for pilots, engineers and operational staff, and setting up of common ground handling facilities. A major benefit of a merger may be the removal of stormy industrial relations stemming from different pay structures and allowances. A graduated career path from regional to national to international operations could be instituted. Aviation experts argue that a single integrated national airline will only work if a hub and spoke route structure is employed.

As a first step to a merger, a holding company may be formed, with both corporations as its subsidiaries. This would facilitate the formulation of overall policy and create conditions for joint planning. Resource mobilisation would also be easier; currently Air-India is making money and paying taxes while Indian Airlines is losing money. The sine qua non for the success of the holding company concept is the grant of functional autonomy to the two corporations in a larger measure than has been given to them in the past. It is only then that they can be held accountable for their performance.

With the recent merger of Vayudoot and Indian Airlines, the chances of a merger between Air-India and Indian Airlines have receded for the present. It is likely that this second merger will be put on hold until the effects of the first merger can be clearly determined. In a recent Press meeting, the Minister stated that the Government was not currently considering a proposal to merge the two airlines. The Secretary of Civil Aviation has announced, however, that the Vayudoot merger is a precursor of an Air-India merger with Indian Airlines. As a first step, the Ministry of Civil Aviation has instructed the two airlines to rationalize their route structures and fleet expansions. Because of a lack of sufficient capacity, Air-India has been operating B-747 long range aircraft on its Gulf routes. As the arrival of Indian Airlines' new A-320 aircraft will create excess capacity, Indian Airlines may operate these aircraft on Air-India's Gulf routes, allowing Air-India to redeploy their aircraft to longer routes for which they are more suited. The government has authorized the two airlines to jointly develop a computerized reservation system.

PRIVATISATION

The move towards deregulation of civil aviation, which started in the USA in mid-1970s, has led to large scale acquisitions and mergers. This happened because the airlines were privately owned. In other countries where airlines were government-owned, the movement has paved the way for privatisation. This process has been aided by a number of other simultaneous developments:

- Realization by governments that operating an airline is neither a national priority nor an obligation of the state;
- Recognition that airlines are commercial undertakings which require professionalism and expertise to manage;
- Awareness that disinvestment would generate resources which could be diverted to priority sectors; and
- Allowing free play to market forces generates competition which benefits the consumers.

As things stand, even if the Government is inclined towards privatisation, it would probably be introduced in stages. As a first step, the staff may be offered equity shares. In the second stage, equity could be sold to financial institutions. This would lead to privatisation only if the Government lets go and does not seek to exercise control by proxy. In the third stage, public and private sector mutual funds could be allowed to bid for equity. Allowing the shares to be traded in the market, while the Government has minority holding may be the last step.

Privatisation of public sector undertakings in the country is being held in abeyance at the present time because of the criticism of the manner in which the shares from previous issues were offered to financial institutions and mutual funds. The shares did not attract as good a price as expected by the Government. In addition, the stock markets are currently in a depressed state. The indications are that the Government will wait for a more opportune moment to resume the privatisation process. Pending a merger, if the Government decides to disinvest its holdings in the two air corporations, possibly the shares of Air-India would be offered first as they would command a higher premium in the marketplace.

PRIVATE CARRIERS

HISTORY

The announcement of an "Open Sky" policy in April 1990 signalled the Government's changed attitude towards "air taxis". Three deregulatory measures emanated from the Open Sky policy. First, in order to create more capacity for air cargo exports, the Government permitted any scheduled or non-scheduled carrier to operate ad hoc cargo flights into and out of India. Second, the clearance procedure for tourist charters was simplified, so that, in addition to the international airports, charters could land at select airports with the required facilities. Third, an Air Taxi scheme was introduced, under which the Government licenced private operators to operate non-scheduled air taxi services within the country. In May 1990, UB Air started the first air taxi operation in India.

In November 1990, a new government raised the size restriction on aircraft from a maximum of 19 seats to one of fewer than 50 seats. Shortly afterwards the restriction was removed, allowing an unrestricted number of seats on any type of aircraft to any destination. This effectively opened up the market to airline-sized aircraft, and allowed de facto private airlines to compete with Indian Airlines using similar aircraft.

During 1990 and 1991 the air taxi/private airline business got off to a slow start with many mistakes and some failures en route. Private operators had to overcome obstacles such as inadequate, or restricted access to, infrastructure and ground handling facilities at airports, threats from Indian Airlines to withdraw revenue from travel agents who dealt with private airlines, and lengthy customs clearance and airworthiness certification procedures. Nevertheless, spurred by the attraction of a very lucrative market, numerous companies made plans to enter the fray. To a prospective private operator, it seemed very simple to be able to operate a vastly superior service to that offered by Indian Airlines.

During the tenure of Mr. Madhavrao Scindia (a great advocate of private airline growth in India, and no doubt responsible for many of the changes in the government's attitude) as Civil Aviation Minister from July 1991 to January 1993, the government turned a blind eye when certain operators began to announce and operate "scheduled" services on the major routes in direct competition with Indian Airlines.

By mid-1992 one company in particular, East West Airlines, began to establish a solid performance record for "on-time" scheduling and customer relations. East West enjoyed a unique advantage because it had no serious competition from other private operators, and were helped considerably after their first nine months by an Indian Airlines pilots' strike that gave them outstanding load factors for almost three months. It also allowed East West to acquire many dissatisfied Indian Airlines pilots. There were others that were barely hanging on such as Continental and Jagson. In addition, two companies were operating "air taxi" permits in their literal sense, i.e. on an ad hoc charter basis: India International Airways and Trans Bharat Aviation.

Towards the end of 1992, with East West Airlines showing that it could be done, a number of serious contenders announced their impending start-up. They were further assisted by new government policies announced in November 1992, which eased the process of obtaining local funds for imported aircraft and

for lease payments. This positive change was reinforced by the February 1993 Budget which withdrew both the 3% import duty on aircraft (even for those taken on lease) and the 17% excise duty on aircraft spares.

CURRENT REGULATORY ENVIRONMENT

The current Minister of Civil Aviation and Tourism, Mr. Ghulam Nabi Azad, was appointed on January 18, 1993, after Mr. Scindia resigned following the crash of a wet-leased aircraft during the Indian Airlines pilots strike. He immediately took an opposing view to that of his predecessor. This change of attitude appeared motivated by a desire to protect Indian Airlines, and the bureaucracy has adjusted swiftly to comply with the Minister's views.

Since May 1993, the Ministry of Civil Aviation and the DGCA have thrown up a variety of new conditions to which private operators are required to adhere:

- 1) "Air taxis" are not allowed to advertise their operations, and therefore, their schedules;
- 2) "Air taxis" are not permitted to purchase or lease: jet aircraft that are either over 15 years old, have completed 75% of their specified economic cycle, or had 45,000 landings; or turboprop aircraft over 20 years old. The DGCA have in fact stated that they would prefer to see a limit of 10 years;
- 3) For every route over 700 kms, an "air taxi" operator must fly one route under 700 kms;
- 4) Foreign equity is not permitted in "air taxi" companies;
- 5) "Air taxis" are not permitted to hire Indian Airlines pilots or engineers without first obtaining a no objection certificate from Indian Airlines;
- 6) "Air taxis" must now obtain a licence from the Director General of Foreign Trade to import an aircraft into India;
- 7) "Air taxis" must install Flight Data Recorders (FDR) and Cockpit Voice Recorders (CVR). Similar installation is not required by Vayudoot; and
- 8) "Air taxis" are not permitted to use Indian Airlines' maintenance or training facilities, even on a commercial basis.

In addition to these conditions, there are a number of other bureaucratic pressures that have been applied, some subtly and some not so subtly, in order to enhance the difficulties faced by operators:

- 1) The International Airports Authority of India (IAAI) and the National Airports Authority (NAA) have respectively asked "air taxi" operators to pay their landing charges two and three months in advance;
- 2) The NAA and the IAAI state that they have no objection to leasing space at their airports to "air taxi" operators but in practice, space is quite difficult to obtain. Most "air taxi" operators carry out routine maintenance right on the tarmac; and
- 3) As air traffic control is not computerised and control towers operate on the pre-electronic slip system, there have been problems obtaining timely departure slots.

In July 1993, the private airlines began to put concerted pressure on the Government to remove the uncertainty surrounding "air taxi" operations. The Parliamentary Committee on Civil Aviation and the Air Passengers Association both recommended that private airline operations be legalized. Possibly as a result, there have been an increasing number of reports that the Government will introduce the bill to amend the Air Corporations Act in the current session of Parliament. Without the passage of this amending bill to allow "air taxis" to fly scheduled services, there will be no future for private airlines in India.

PRIVATE AIRLINES - AIR TAXIS

Since UB Air first started in May 1990, five companies have started operations and failed. More than 40 No Objection Certificates (NOC) (the first step to obtaining a permit) have been issued. Today, 15 companies have air taxi permits, 21 have NOCs and another 10 have applications pending with the DGCA for an NOC. There are currently six companies offering scheduled airline services: five with 100-seat or more aircraft on major routes; and one with less than 20-seat aircraft on regional routes:

<u>NAME</u>	<u>BASE</u>	<u>ROUTES</u>
ARCHANA AIRWAYS	Delhi	Regional
CITYLINK AIRWAYS	Delhi	Major routes
DAMANIA AIRWAYS	Bombay	Major routes
EAST WEST AIRLINES	Bombay	Major routes
JET AIRWAYS	Bombay	Major routes
MODILUFT	Delhi	Major routes

In addition, there are five companies offering strictly air taxi operations, i.e. on a charter basis:

<u>NAME</u>	<u>BASE</u>	<u>FLEET</u>
AERIAL SERVICES PVT LTD	Bombay	Fixed Wing
DELHI GULF AIRWAYS	Delhi	Helicopter
INDIA INTERNATIONAL AIRWAYS	Delhi	Fixed wing
MESCO AIRLINES	Delhi	Helicopter
TRANS BHARAT AVIATION	Delhi	Fixed wing

Operations

The five private airlines operating on the major routes are actively competing with Indian Airlines, particularly on the Bombay-Delhi sector. They all offer superior in-flight service for the same fare that Indian Airlines charges ("air taxis" are not permitted to charge lower fares than Indian Airlines). Two of the operators have separate classes in their Boeing 737 configuration: Jet Airways has business and economy; and Modiluft has first, business and economy.

Despite the roadblocks and uncertainties, the private airlines have begun to make their presence felt, especially in Bombay. While in 1988-89, the national carriers handled 100% of India's domestic traffic, in 1992-93, their share dropped to 90%. Furthermore, in Bombay, where most private airlines are based, they have a total of 28 arrivals and departures compared to 38 for Indian Airlines, and they handle over 16% of domestic passengers. The number of passengers carried annually by private operators has increased from less than 600 in 1990-91 to almost 700,000 in 1992-93, of which East West Airlines accounts for 80-85%. Most private airlines have been operating at or above their break even load factors.

In total, private airlines with scheduled services operate almost 25 aircraft, with expansion plans to add another 20 aircraft within the next year. The largest, East West Airlines, has been operating for almost 18 months and has a fleet of ten aircraft. The remaining companies have all commenced operations within the past five months and have small fleets of less than five aircraft. Except for Archana Airways, all of the private airlines are operating leased aircraft, with the aircraft of choice being the Boeing 737-200. Until these private airlines become more firmly established, and legislation is passed to legalize scheduled operations, it is unlikely that they will be in a position to purchase aircraft. While all of the private airlines have announced fleet expansions, most are currently on hold because of the uncertain political climate.

Recent reports indicate that Citylink may wind up its operations in July upon the expiry of its aircraft lease. There are also reports that UB Air, Sahara India Airlines and Raj Aviation will start operations shortly. Two private airlines, Modiluft and East West, have received landing rights to Gulf countries, and have been seeking permission from the Indian government to fly these routes. Modiluft has an upcoming public issue to raise funds and East West has made several announcements that it intends to have a public issue as well. No doubt others are contemplating it, particularly once the primary market regains its buoyancy. Air fares in India are charged either in Rupees for Indian residents or US dollars for foreigners, with the value of the hard currency ticket being approximately 50% higher than that of the Rupee ticket. This makes foreign passengers very attractive, and several of the private airlines have sought and concluded interline agreements with Air-India and major international carriers. A profile of each private airline and air taxi operator, as well as a listing of all the companies that have been involved or have announced their involvement in the business, are included in Appendix I.

An Association of Air Taxi Operators was launched earlier this year to lobby for its members. It has not been successful to date and is, in effect, inoperative, perhaps due to the fact that most operators, in the current rapidly changing circumstances, spend all their time fighting for their individual, rather than their collective, rights.

Maintenance

There is a problem with maintenance and ground handling. As per government directives, private airlines are not permitted to contract services from Indian Airlines. There is insufficient hangar space at most airports, and most private airlines have been carrying out operational maintenance and repairs right on the tarmac. None of the private airlines are sufficiently established to set up their own maintenance facilities, although East West has indicated that it plans to. Most private airlines have either made arrangements through wet-leasing aircraft, technical co-operation agreements with foreign airlines, or contracting services of foreign companies for their operational maintenance requirements and heavy maintenance checks. In a recent development, Hindustan Aeronautics Limited has carried out a C check on one of East West's B-737. There is a need for massive investment in maintenance and ground handling facilities. As the private airlines do not have the capital to set up this infrastructure overnight, there are opportunities for leasing companies to supply stairways, buses, battery carts and other equipment.

Cargo

East West Airlines began cargo operations in November 1992. It operates to 22 destinations, and carries about 150,000 kgs of freight a month from Bombay alone. It has plans to commence international cargo operations. Jet Airways currently has cargo capacity of 40 metric tonnes per day on 11 routes. Courier cargo, accompanied by an on-board passenger, is a significant component. Jet Airways is confident of becoming a significant domestic cargo carrier. Damania Airways is planning to start cargo operations in August, at present it only carries courier cargo.

As the Department of Posts has experienced difficulties with Indian Airlines, it has sought government approval to use private airlines to ferry air mail within India. Indian Airlines handles 16,000 tonnes of air mail annually, charging Rs. 7.4 per kg over a distance of 1,000 kms. East West has apparently offered the Department of Posts a flat 10% discount on this rate.

FUTURE PROSPECTS

Policy

For most of this year, the private airlines have been operating under an uncertain and changing policy environment, with the Government imposing more and more restrictions on private airline operations. In effect, all "air taxi" companies offering scheduled services are still operating in defiance of the law. Just as in many other sectors of the economy, the Government's economic liberalization program has yet to filter down to the working level in the bureaucracy, and has not been equally embraced by all ministries. This bureaucratic attitude has stifled private sector involvement in civil aviation in India up to now.

In a recent report, the Parliamentary Committee on Civil Aviation, chaired by Mr. Pramod Mahajan, has come down heavily on the Government's confused civil aviation policy. The report, to be submitted during the current Monsoon Session of Parliament, is purported to criticize the Government's method of introducing new regulations at frequent intervals, and to demand: that the Air Corporations Act be repealed; that private airlines be given the same facilities at airports as the national carriers; that private airlines be allowed to operate on international routes; and that foreign equity in private airlines be permitted as long as there is no foreign exchange outflow.

To date, private airlines have had to operate with less than adequate airport facilities. They have not been permitted to operate on international routes. Although two companies have received landing rights from Gulf countries, they have not received permission from the Indian Government. Foreign equity has not been permitted in private airlines. Both Modiluft and Jet Airways have made applications. The Ministry of Civil Aviation remains firmly opposed to the idea, while the Ministry of Industry is of the opinion that the same regulations for investment in other sectors of the economy should apply to civil aviation as well. On the positive side, the DGCA has recently authorised funds to the National Airports Authority to upgrade various airports - Rs. 2.5 billion for this year and a total of Rs. 9.0 billion over the next three years to modernize airports. Included in these modernization programs are provisions for additional hangars and counter space for private airlines.

It is understood that the government now plans to table the bill to amend the Air Corporations Act, which was supposed to be introduced in May 1992, in the Monsoon Session of Parliament. Should the Air Corporations Act be amended and should the Government continue to liberalise, there will be increased confidence in the private

airline business, leading to greater stability and expansion. Most analysts believe that, at the most, three or four private airlines will survive, with the others folding or being amalgamated with the survivors. Whatever shape the Air Corporation Act amendments take, ultimately, the Government is unlikely to be completely "hands off" with the private airlines because of its concern for the national carriers. So it is to be expected that there will always be some regulation of fares, routes and the overall number of operators.

While the future of the private airlines lies squarely in the hands of the Government policy makers, the longer the private airlines continue to operate the greater will be their influence, and the more accustomed the flying public will become to the benefits of competition and an industry driven by standards of service.

Operations

While Indian Airlines has claimed that the private airlines rather than complementing its operations are diverting passengers from its flights, several studies have projected much larger and increasing traffic. In a report prepared for Jet Airways, Arthur Anderson suggest that there is a market of 23 million domestic passengers annually in India. Indian Airlines is currently carrying slightly less than 10 million per year. Arthur Anderson also predicts that the market will grow by 12% per year. This study is in line with others that have been produced by the International Airports Authority of India and the International Air Transport Association. The former projects 9% and 12% annual growth respectively for international and domestic traffic, while the latter has forecast 7.2% annual growth for international traffic.

Competition among the private airlines is expected to become intense as most have concentrated on the major routes, particularly the Bombay-Delhi sector, which is quickly becoming oversaturated. In fact, load factors have already begun to drop on the Bombay-Delhi sector as there are now over 12 return flights daily on this route. This increased competition on the major trunk routes, and the Government's new regulation that private airlines must operate one route under 700 kms for every one over 700 kms, will force private airlines to operate on the currently unserved regional routes.

However, any delay in passenger numbers rising to the forecast levels will cause rationalisation in the number of private airlines. Either way, certain of the existing operators have adequate financial backing, and sufficient influence, to enable them to continue operating, to prosper and to grow. These surviving operators, having been encouraged to think short term by the insecurity of the policy environment, have opted for lease and not purchase of aircraft. This is likely to continue and they are unlikely to change their procurement decisions, preferring to retain equipment for which there is indigenous expertise and with which the flying public is familiar.

Provided that private operators are not overly restricted in their ability to develop the necessary infrastructure, they will diversify into cargo operations.

Aircraft

To date, the aircraft of choice of India's private airlines has been the 737-200. The current recession in the world airline business, coupled with the fact that the Boeing 737-200 no longer meets noise restrictions in North America and Europe, has made it quite easy for Indian private airlines to lease these aircraft at low rates. As the Indian fleet expands and the world aviation industry begins to slowly climb out of recession, availability of these aircraft is going to diminish, and leasing costs will rise. In addition, the private airlines will no longer have ready access to the supply of trained pilots from Indian Airlines.

Current expansion plans of the private airlines are to increase their fleets from around 25 to about 45 aircraft within the next year. Until the civil aviation scene in India becomes more certain, the private airlines will continue to rely on leased aircraft; only Archana Airways has purchased aircraft. In fact, the private airlines are likely to put off any expansion plans until amendments are made to the Air Corporations Act to legalize their operations. The private airlines are also likely to wait until after the peak tourist season this winter to determine how they are fairing, before making expansion or purchase plans.

With the Government's new regulation of one route under 700 kms for every one over 700 kms, the private airlines will be forced to look at acquiring smaller regional aircraft, as the larger B-737s are very uneconomical on these shorter routes. An aircraft manufacturer which enters into a co-production agreement with Hindustan Aeronautics Limited (HAL), and has its aircraft selected by Vayudoot, will be in the best position to sell to the private airlines as the cost of an aircraft co-produced in India would be less and commonality of aircraft would allow for joint maintenance facilities to be established.

PART II — FLIGHT TRAINING

The Government of India is a dominant influence in flight training, through relatively consistent regulation as well as through irregular subsidies of funds and aircraft. The unpredictability of the latter has fostered among the flying clubs a dependence and an inability to plan and set independent directions. The training subsidies for students (Indian nationals) have naturally decreased the time available for club and leisure flying and increased the time allocated to training.

FACILITIES

Civilian flying training in India is carried out through 22 private and 6 state-owned flying clubs and one central government flying school. The majority of the flying establishments are affiliated with the Aero Club of India. Aircraft procurement for the clubs is done either collectively by the government through the Aero Club of India, or individually by the flying clubs themselves. Fifteen of the flying establishments are sponsored and maintained by their respective state governments. The flying clubs provide initial training, generally up to the level of a Private Pilot's Licence.

The Central Government school, the Indira Gandhi Rashtriya Uran Akademi (IGRUA) at Furstatgang in Uttar Pradesh, has a modern fleet of 7 Aerospatiale Trinidad basic/advanced trainers, 2 Beech Kingairs and 2 Robinson R22 helicopters. The 1992-93 budget allocation to IGRUA by the Ministry of Civil Aviation was Rs. 150 million.

The flying clubs tend to differ quite markedly in the service that they offer to students. Many, such as Delhi and Baroda, have good reputations, some, such as Bombay, offer indifferent service, and others appear to be experiencing financial difficulties. Both the flying clubs and IGRUA offer training for Indian nationals that is heavily subsidised by the Ministry of Civil Aviation at 15% of the normal cost for the first 60 hours of training. The Ministry provides further subsidised training for the Assistant Flying Instructors Rating. While there are about 500 students who join this system each year, there is a heavy drop out rate. For a listing of Flying Training Establishments see Appendix J.

About 150 commercial pilots are trained each year in India. The majority are trained at Indian Airlines' Central Training Establishment in Hyderabad. Many more commercial pilots have received training through the various aviation corps of the Indian Armed Forces. With the emergence of the private airlines, an acute shortage of commercial pilots has occurred. As many of the private airlines are operating Boeing 737 aircraft, they have been active in wooing pilots away from Indian Airlines. Over 100 pilots have left in the last year, as the private airlines are offering salaries as much as five times more than those offered by Indian Airlines. To stem this exodus, in early 1993, the Government announced a restriction on private airlines hiring Indian Airlines pilots.

Indian Airlines' Central Training Establishment (CTE) has two A-320, one A-300, one B-737 (3-axis), one B-737 (6-axis) and one HS-748 simulators. The CTE, according to its former Director, Captain R.P. Barnwal, plans to phase out its B-737 and HS-748 simulators as they have become obsolete. Indian Airlines has also trained pilots and flight engineers from other organizations such as Air-India and the Indian Air Force at its facilities.

At its Operations Training Centre in Bombay, Air-India conducts all its flight crew training. It has Boeing 747 and Airbus A-310-300 simulators. These six degrees freedom of motion simulators are equipped with visual systems capable of generating colour day/dusk/night airport scenes. A new Boeing 747-400 simulator is expected to be operational in September.

Two private airlines, East West Airlines and Jet Airways, have indicated their intention to set up training establishments for pilot training. Mr. Vijayapat Singhania has also indicated his intention to set up a training facility with a B-737 simulator.

AIRCRAFT

In the 1970s and 1980s, all twenty-eight flying clubs used de Havilland Chipmunks and HAL Pushpaks. Towards the end of the 1980s, the Aero Club of India secured an advantageous deal with Cessna Aircraft

for 28 Cessna 152 trainers, prior to the closure of Cessna's single engine line. The Cessna aircraft were distributed unevenly among the 28 flying clubs. A few clubs also own Piper PA 18 Super Cubs for tailwheel training, as very few Chipmunks and Pushpaks remain in service. The Aero Club also bought, from a Canadian company, 24 (8 dual and 16 single seat) Husky ultralight aircraft. These ultralights were not distributed, and are never expected to be used for flight training in India. There are a variety of reasons for this, one of them being that certification of ultralights in India is somewhat different from the process in Canada and it apparently proved to be a major stumbling block. This whole saga has been a rather unfortunate experience for all the parties concerned.

Recently a number of aircraft have been brought to India in order to market them for flying training. For example, Riviera Aviation of Bombay demonstrated a Rans ultralight and offered it as a trainer and personal executive transport at Rs. 950,000. but none have sold as yet. Hyderabad Batteries promised to import a USA built ultralight last year but nothing has transpired. Bashi Aerospace of Bangalore is rumoured to be planning to produce a two seat trainer, but the company is non-committal and has so far only been providing engineers on short-term contract to the National Aeronautics Laboratory (NAL). Raj Hamsa Aero Sports Limited of Mysore, run by a French national, is building ultralights that do not really match training needs as they are powered weight-shift delta-wing aircraft. The company has plans for a three axis machine in the future.

The NAL has designed a light aircraft trainer called the NAL-LA (for NAL Light Aircraft). NAL have a tentative agreement with Taneja Aerospace of Hosur (near Bangalore) to build and market this composite design. See NAL under Indian Aerospace Companies for details.

HAL has shown consistent interest in the field of civil training. It abandoned an ultralight project in the mid 1980s after spending Rs 5.2 million. More recently, HAL has obtained civil certification for its military basic trainer, the HPT-32. No price has been announced, but as it is built to military specifications (i.e. fully aerobatic, etc.), it will probably not be price competitive for civil training.

The DGCA commissioned it's own R&D Directorate to design a trainer that it contracted Bharat Heavy Engineering Limited (BHEL) to manufacture. The aircraft is called the "Swati" and has both the appearance and engineering typical of 1950s aircraft. BHEL have since been asked to convert the aircraft from a tailwheel to a nosewheel and that, plus many other problems, have caused the entire project to slide. See BHEL under Indian Aerospace Companies for more details. Working in BHEL's favour, however, is the fact that most of the flying clubs are so strapped financially that they will take anything that comes to them at no cost. It is quite possible that, if the Swati is ever produced, it will be issued, like the Cessna 152s, free to these institutions (with the Government of India footing the bill). If, on the other hand, the Swati runs into difficulties, then the Central Government may well be persuaded by the flying training lobby to import training aircraft again, particularly if nothing else has appeared from domestic manufacturers.

PROSPECTS

There will be considerable pressure on BHEL and the DGCA to make the Swati a success. However, the flight testing program suffered yet another setback when a prototype crashed in early June. If the Swati does not materialise, the Government, which is being pressured by flying clubs desperate for new equipment, may be forced to look outside the country again. If it does, the DGCA will clearly favour an aircraft that is likely to be certified on the Indian Register.

If the anticipated growth in airline passenger traffic is realised, the indigenous airline fleet, both private and national, will certainly grow. This will require an increased number of trained pilots and engineers, some of whom will come from the military, but most will have to come from an increased output from the training establishments.

Along with this growth will be the need for simulator training establishments for the more common aircraft types, such as the Boeing 737, as well as newly-inducted aircraft types. There will also be a need for contracting simulator time outside the country, as well as training on new aircraft that the private operators lease/ These developments, along with the plans of East West Airlines and The Raymond Woollen Mills to establish simulator training facilities, present good opportunities for Canadian simulator companies.

PART III —CORPORATE AIRCRAFT

In the 1940s and 1950s, a number of Indian industrial houses imported aircraft of varying sizes for both corporate and personal use. During the 1960s, the importation of these aircraft gradually grew more difficult until, by the 1980s, it had become almost impossible to obtain an import permit for a corporate aircraft. The Government's stated reason for restricting these imports was that foreign exchange reserves had to be conserved for higher priority imports. Other reasons left unstated by the Government were that in its view the three national carriers together provided a comprehensive network covering all the locations to which business people might want to travel, and the perception that corporate aircraft were a capitalist luxury that the developing Indian economy could ill afford. Furthermore, it was reasoned that HAL produced the Avro HS-748 and Dornier 228 which were regarded as corporate aircraft.

This tight importation policy has resulted in a number of Indian companies operating old and inefficient corporate aircraft, many of which are looking for newer models. (Corporate aircraft owners are listed in Appendix K). The Indian Civil Aviation Register includes 683 aircraft, 107 gliders, 7 experimental, 30 micro or ultralights and 2 balloons. Of the 683 aircraft, only a little over 100 fly regularly, and of these 31 are turboprops and 4 are jets.

CURRENT ENVIRONMENT

While the past 30 years have been difficult for corporate aircraft imports, manufacturers of corporate aircraft still considered it important to appoint Indian dealers or agents. Most have floundered under the stifling barriers they confronted in attempting to import aircraft. The Beechcraft dealer in India, however, found a very effective loophole in the import regulations many years ago. It would sell new aircraft to State Governments which were allowed to purchase aircraft. The State Governments would operate the aircraft for three or four years, at which point Indamer would sell them a new aircraft, taking the used one on trade or part exchange. About half of the State Governments availed themselves of this option (the 13 State Governments that operate aircraft are listed in Appendix L). The used aircraft, now on the Indian register, were available for resale to the private sector. With this system Beech have, over 30 years, sold about 30 twin-engined piston aircraft and 27 turbo prop aircraft. To date, this is virtually the total complement of imported corporate aircraft in India.

With the Open Sky policy of 1990, it was hoped that the Ministry of Civil Aviation would also ease the restrictions on importing corporate aircraft. However, this has not yet happened and the difficulty ostensibly lies with the Office of the Chief Controller of Imports and Exports, which has stated:

"Subject - present Policy regarding importing new and used corporate/business aircraft into India. The Policy on this subject is still under consideration of the Government of India as regards import of corporate/business aircrafts".

The present Controller of Imports and Exports has chosen to interpret the law in a most restrictive fashion, which has made it difficult to import corporate aircraft. Despite the customs difficulties, corporate jets have been imported recently into India. The Tata Iron and Steel Co (TISCO) brought in a Cessna Citation jet as part of a steel related collaboration with a German company, through another legal loophole. However, recent confusing statements about whether the aircraft is a gift or not have caused some negative press for corporate aviation in general. The Tata Engineering and Locomotive Co (TELCO) is operating a Beechjet 400 through an "air taxi" arrangement with Aerial Services. The Oswal Group also hope to start operating a Beechjet on a similar basis soon. A few non-resident Indians have jet aircraft based and registered abroad that they are able to operate into and around India for up to six months in any one year. Mr Vijay Mallya, Chairman of the UB Group has a Gulfstream IIB and a BAe125 that he operates in this fashion.

Three major companies based in Pune have banded together and formed a joint aviation department. They have a department manager and technical staff looking after their pool of 6 aircraft - mixed turbo prop and piston engined aircraft. Their plans are eventually to re-equip with turbo props giving them a single model aviation department. Their fleet sharing system works so well that they have other companies lining up to join them and their success may encourage companies elsewhere to band together in a similar manner.

PROSPECTS

In considering the regulatory restrictions on importation placed on the corporate aircraft sector it is interesting to note that, in spite of these limitations, a relatively high number of Indian companies are utilising corporate aircraft in one way or another. Of the top 100 Indian companies listed in Business India, 33% own, share as a joint user, or charter corporate aircraft. These aircraft range from piston twins, helicopters, and turbo props through to jets. However, because of the regulatory limitations, the majority of these aircraft tend to be aging. There is therefore a small market, particularly amongst these top companies, for new and used aircraft to enter the Indian Register. Corporate operators will look increasingly towards turbine equipment as the procurement of aviation gas at certain airfields is already difficult, and it will continue to be less and less easily available. However, it will require a change of attitude within the Office of the Controller of Imports and Exports and therefore on the part of the Government, towards this branch of aviation.

For a long time now, the Indian corporate world has been used to having to fly India's national carriers, but now, with private airlines and corporate aircraft available for charter, executives are becoming used to a higher level of service and the time and cost advantages of flexible schedules. This will slowly lead to a change of attitude to aviation in general that will have a positive impact on the view of corporate flying. Recently there have been subtle changes in attitudes towards executive salaries, recognising that quality has to be paid for. This attitude change will also help the acceptance of corporate aircraft as a business tool and not simply as a luxury.

The liberalisation of Indian investment overseas will also be a catalyst for change in the perception of corporate aviation, particularly with long range aircraft. Although this is likely to remain relatively small, there are already some examples (eg. Vijay Mallya's UB Group) of corporate aircraft used to link international business empires, and Indian companies are now increasing their investments overseas. To encourage this general change in corporate attitudes further there is a new generation of young managers who are no longer as willing to accept the status quo, and who are often western trained. These new managers better understand the importance of a corporate aircraft as a business tool.

In the past six months, both Beechcraft and Cessna seem to have increased their interest in the Indian market, as they have been advertising their corporate jets in major business newspapers. Beech is represented in India by Indamer, and Cessna by Aerosystem. In addition, there are two companies planning to build corporate size aircraft in India. NAL is developing a light transport aircraft (LTA) at a cost of Rs. 800 million (see NAL under Indian Aerospace Companies for details). The current plan is for a 14-seat twin turbo prop. NAL believes that there is a market for 300 aircraft of this type over the next 10 years. Taneja Aerospace and Aviation Limited (TAAL) of Bangalore has entered into a technical collaboration agreement to build the Italian Partenavia, a line comprising a 7-seat piston twin and a 14-seat twin turbo prop. (see TAAL under Indian Aerospace Companies for details).

PART IV — AEROSPACE INDUSTRY IN INDIA

India's aircraft industry has traditionally been almost totally defence oriented. Only in the last two years, as the Government has liberalized the Indian economy and the end of the Cold War has reduced defence spending, has India's aerospace industry seriously turned its attention to the civil aviation market. For the most part, India's aerospace industry is concentrated in the public sector, with only a few private sector companies now starting to enter the market. Hindustan Aeronautics Limited is the largest public sector company involved in the aerospace industry. It dominates the domestic production of aircraft and aero engines, and accounts for about 80% of the industry's activity. Some of the major companies in the Indian aerospace industry are profiled below. Contact information for these companies is provided in Appendix M.

INDIAN AEROSPACE COMPANIES

HINDUSTAN AERONAUTICS LIMITED (HAL)

Hindustan Aeronautics Limited (HAL) is the largest public sector undertaking under the administrative control of the Department of Defence Production and Supplies. HAL is engaged in comprehensive aerospace activity,

covering design and development, production, and overhaul of aircraft. Its product mix includes rotary and fixed wing aircraft of indigenous design, military and civilian aircraft/helicopters manufactured under licence from foreign manufacturers, jet and piston engines to power them and their avionics and accessories. HAL's prime customer is the Indian Air Force.

With the end of the Cold War and the resultant shrinking of military budgets, HAL plans to diversify its production and shift its emphasis towards the civil aviation market. Three main projects envisaged are co-production of a 50/70 seat regional aircraft, production of a civil version of the Advanced Light Helicopter (ALH), and establishment of a third party maintenance facility.

Organisation

HAL employs over 40,000 personnel in its four Complexes and 12 Divisions. The four Complexes are Bangalore Complex, MiG Complex, Accessories Complex and Design Complex. The Corporate office and HAL's main complex are located in Bangalore. This complex has six divisions: Aircraft Division; Helicopter Division; Engine Division; Overhaul Division; Foundry and Forge Division; and Aerospace Division. The MiG Complex has two Divisions at Koraput and Nasik. The Accessories Complex has four Divisions at Kanpur, Hyderabad, Lucknow, and Korwa. The Design Complex is located in Bangalore. Administratively and functionally each Division operates independently, but major policy decisions are taken by the Corporate office.

All foreign companies are advised to contact the Corporate office first with any proposals or enquiries. Subsequent contact may be established with subsidiary offices as required. It may be mentioned here that after the alleged "pay off" scandals, the Ministry of Defence and HAL now require foreign companies submitting a bid for their equipment or services to declare that they have no agents in India. They may, however, operate through their representative offices or overseas branches.

During 1991-92 HAL became an MOU (Memorandum of Understanding) Company which makes it more fiscally accountable. As India's new industrial policy has done away with the licensing system, HAL can now set up joint ventures with foreign companies. However, being a public sector undertaking it has to obtain Government approval before setting up joint ventures. A brief description of the various Divisions, their activities, product range, collaboration agreements and contact information is provided in Appendix N.

Annual Performance

During 1991-92 HAL achieved production of Rs. 9.71 billion, compared to Rs. 8.96 billion in 1990-91. The 1991-92 revenue and before tax profit of HAL were Rs. 10.24 billion and Rs. 544.8 million respectively. HAL paid a dividend of 9.128% amounting to Rs. 110 million. In 1992-93, its turnover reached an all time high of Rs. 10.34 billion. The audited results are yet to be released.

In 1991-92, HAL achieved exports of Rs. 150 million. This is a negligible amount, being only 1.45% of turnover. Last year it received orders for supply of spares and for overhaul from the Royal Malaysian Air Force, Mauritius, Sri Lanka Air Force and Druk Air of Bhutan. It has also received orders from Oman for overhaul of Hunter Avon engines.

Medium Transport Aircraft

HAL wants to produce 50/70 seat commercial aircraft. Since it does not want to make heavy capital investments, but can provide the infrastructure, it has floated "Requests for Proposal" (RFPs) for co-production. This project has taken on a higher significance since the Government announced that Vayudoot will replace its HS-748s and Dornier 228s with a new 50-seat regional airliner. In June 1993, the Government appointed a six member committee, chaired by Mr. R.N. Sharma, Chairman, HAL, to select a new aircraft. The selection committee is to present its report within the next few months. Senior officials in the Ministry of Civil Aviation have admitted that there is a definite correlation between Vayudoot's aircraft selection and HAL's search for a regional aircraft co-production partner. The major manufacturers of regional aircraft which are seriously pursuing this project are Fokker, ATR and de Havilland. HAL projects that there is a market for 200-250 such aircraft in India, in addition to sales in neighbouring markets. Such an aircraft would also find a market with the Indian Coast Guard and Navy for anti-submarine and ASW patrol duty, and with the Army for border surveillance and airborne early warning. Discussions have already been held with all three manufacturers. In addition, BAe demonstrated its 68-seat ATP in Bangalore on May 3 and Fokker demonstrated its Fokker 50 throughout the country in late May.

HAL has already taken what it believes is the first step towards civil aircraft co-production. It already produces the HS-748 and the Dornier 228 turbo prop aircraft under licence, and it is currently subcontracting the manufacture of tailplane assemblies for the BAe ATP aircraft, forward passenger doors for the A-320, landing gears for the Dornier 228, as well as a wide spectrum of piece parts for airframes and engines. HAL has signed a ten-year contract with Aerospatiale to supply 600 forward passenger doors for the A-320 and A-321 aircraft. At a subsequent stage, HAL would like to conclude a co-production agreement for 100-130 seat jets. It has also been reported that the Russian Government has offered HAL a proposal for co-production of a heavy transport aircraft, like the TU-204 or IL-96.

For details on HAL's Advanced Light Helicopter (ALH) program, and its proposal to establish a third party heavy maintenance facility, see respectively, the profile of HAL's Helicopter Division in Appendix N, and the section on Maintenance of Civil Aircraft.

Software Export

On January 25, 1993, BAe and HAL signed an agreement to set up a joint venture to produce specialised software for engineering applications in the aeronautical industry. The joint venture company will use a dedicated satellite and fibre optic links between the computer terminals in HAL Bangalore and BAe's IBM mainframe computer based at Lancashire, England. The software company is 100% export oriented. The company has a paid-up capital of Rs. 60 million, with HAL holding 49%, BAe 40% and the Industrial Credit and Investment Corporation of India 11%.

NATIONAL AERONAUTICAL LABORATORY

NAL, located in Bangalore, functions under the CSIR (Council of Scientific and Industrial Research), Ministry of Science & Technology. Established in 1959, it is one of India's prime institutions engaged in research and development in varied disciplines connected with aeronautics and astronautics. It has an annual budget of Rs. 300 million, employing over 1,300 people. As grants received from CSIR do not meet salary and overhead costs, NAL has placed increasing importance on commercializing its technologies. In 1992-93, NAL earned Rs. 156 million from external projects. Delegates from the equipment division of GEFAS, the French aerospace industry association visited Bangalore in April 1993 for talks with NAL about joint ventures. NAL is currently working on two major aircraft projects and a number of research projects.

One of NAL's strengths is its advanced facilities. The National Trisonic Aerodynamic Facilities (NTAF) of NAL has an indigenously designed and built 0.6 metre transonic wind tunnel (commissioned in 1989), a 1.2 metre trisonic wind tunnel (commissioned in 1967) and has begun a Rs. 1.5 billion project to instal a 2.4 metre high speed wind tunnel. NTAF is funded by its four main users - CSIR, HAL, Indian Space Research Organization (ISRO), and Defence Research and Development Organization (DRDO).

In collaboration with the Indian Space Research Organisation (ISRO), NAL has designed, built and commissioned an 1100 cubic metre acoustic test facility. The facility has already been used for tests on various satellites.

Light Aircraft Trainer (NAL-LA)

NAL visualizes a requirement within India of a new affordable trainer aircraft for use by flying clubs. NAL-LA is a light weight, side-by-side, two-seater ab-initio trainer, with a Continental 125 hp engine. The original engine design was a pusher type, now it is tractor. It has an all composite structure, and a maximum cruise speed of 115 knots. The project proposes to use advanced technology in design and development of the aircraft. It is understood that the preliminary design has been completed and the configuration frozen (no change in shape or design). Detailed structural layouts have been made for most components.

NAL hopes to fly a prototype of this hi-tech trainer by the end of 1993, and to market it by the end of 1994 at a cost of Rs. 2.5 million. The Rs. 20 million development cost is being split 2/3 to 1/3 between NAL and Taneja Aerospace and Aviation Limited (TAAL). It is likely that production will be done by TAAL.

Light Transport Aircraft (LTA)

The LTA is to be a 9-14 seat, multi-role light transport aircraft. It is being designed and built indigenously to specific Indian requirements. NAL completed conceptual and preliminary studies on the LTA in 1989.

Detailed feasibility studies and three wind tunnel tests have now been completed. The suggested design for the 14-seater is a twin aft mounted pusher turbo prop, with a maximum payload of 1,300 kgs, a cruise speed of 520 kmph, and a range of 2,800 kms. Pratt and Whitney Canada have offered five PT 6A-66 engines free for the first prototype.

NAL has received an offer from a Russian company, Myasishev Design Bureau (MDB), to acquire an interest in the LTA project. Under this agreement, which is to be signed shortly, MDB would cover Rs. 400 million of the Rs. 800 million project cost for development, design and manufacture of three prototypes (two in Russia and one in India). The Indian Government and a private industrialist will cover Rs. 200 million each. Two prototypes will be built and flown in Russia 15 and 21 months after the contract is signed, and one prototype in India 33 months after the contract signing. NAL projects a market for at least 200 aircraft in India over the next 10 years, while MDB forecasts a market of over 1,000 aircraft in Russia. Production will be undertaken in both countries for their respective domestic markets, and sales by either partner will entail royalty payments to the other partner. For third country orders, production may be shared. NAL requires another Rs. 200 million to take the project to the production stage, and is looking for a private India company to participate. Once again, NAL may find a partner in TAAL.

Light Canard Research Aircraft (LCRA)

NAL had already built and test flown an LCRA in early 1987. Now in collaboration with the DLR of Germany it proposes to develop a variable stability research aircraft. The airframe of LCRA is made entirely of rigid foam and fibreglass composites. The technology is similar to that used by RUTAN aircraft in the USA for the VOYAGER, which created aviation history by flying non-stop around the world. In fact, the Rutan-EZ design has been followed. The control surface is a "canard" in front, instead of the conventional aft-tail.

Software for Fluid and Thermal Sciences Programme

It has made satisfactory progress and has about 1,000 computer codes in its library. It is being extensively used by engineers from the ADE (Aeronautical Development Establishment) and HAL engaged in the LCA programme.

Naltech

NAL has set up a joint venture with the Centre for Technology Development to commercialize and market NAL's research and development projects. NAL has developed a Flight Data Recorder (FDR) decoding system, which it wants to sell on the world market. The decoding system will be one of the first NAL technologies to be marketed by Naltech.

AERONAUTICAL DEVELOPMENT AGENCY (ADA)

The ADA was set up in Bangalore in 1983 under the Defence Research and Development Organisation (DRDO), Ministry of Defence. Its primary function is to fund, manage and monitor the Light-Combat Aircraft (LCA) project for the IAF. Of the more than 80 centres working on the LCA project, HAL's Design Complex is the major participant, while NAL, ADE (Aeronautical Development Establishment), GTRE (Gas Turbine Research Establishment) and ERDE (Electronic and Radar Development Establishment) play an important role in their areas of specialisation. The LCA program is by far the longest and the most ambitious project undertaken by HAL's Design Complex.

Feasibility studies commenced in 1983 and were completed by June 1984, with the go-ahead for design and development received in January 1985. Project definition was completed in September 1988, and detailed design commenced shortly thereafter. The project is now a decade behind schedule. The development cost is estimated at Rs. 50 billion. Phase I, up to building of prototypes will cost Rs. 22 billion, with a foreign exchange component of Rs. 9 billion. Foreign vendors have already been identified for imported prototype components (RPG - Honeywell/Litton, composite wings - Alenia). HAL envisages a foreign collaboration with either the UK, the USA, Germany or France for production.

A single-engined, multi-role, all weather fighter, the LCA is optimally designed for an "air superiority" role with offensive close air support and interdiction capabilities. The design of the LCA will be that of a compound delta-wing with negative dihedral, weighing some 8.3 tons and initially powered by a General Electric F 404-F2J3 turbofan engine of 8,450 kg reheat thrust. The Project Definition Phase (PDP)

consultancy has been awarded to Avions Marcel Dassault Breguet Aviation of France. The first flight of the LCA is scheduled for June 1996, and the LCA is not likely to enter service before 2005.

The ADA is also currently undertaking preliminary studies for a 120-seat medium transport aircraft.

ADE is a different organisation from ADA. Established in 1959, ADE is engaged in design and development programmes on all other aspects of combat aircraft such as aerodynamics, structures, flight controls, avionics, air armament and flight simulation.

AIRCRAFT AND SYSTEMS TESTING ESTABLISHMENT (ASTE)

ASTE is a Bangalore-based unit of the Indian Air Force reporting directly to Air Headquarters. It carries out experimental test flying. It also undertakes tests on related equipment such as flight test instrumentation, flight test techniques, ground and flight simulators, airborne avionic systems, and night vision devices.

ASTE cooperates with the HAL Flight Test Centre in carrying out joint development trials for IAF projects. In this role it has contributed significantly to the development of indigenous designs and modifications. ASTE suffers from two limitations. In the first place, it does not carry out testing under simulated operational conditions. Secondly, it does not undertake flight testing of civil aircraft. Nevertheless, ASTE is the only organisation in Asia where experimental test flying is being carried out.

GAS TURBINE RESEARCH ESTABLISHMENT (GTRE)

This establishment functions under the Defence Research and Development Organisation (DRDO), Ministry of Defence. With virtually no track record for engine development, GTRE has been engaged in the design and flight testing of a reheat version of the Orpheus jet engine. This engine will provide a base for the indigenous Kaveri GTX demonstration engine designed for a dry thrust of 4,500 kg and after burner thrust of 7,000 kgs. Developed as a precursor to the full development programme, this demonstrator incorporates various advanced techniques such as a transonic compressor annular combustor, a shrouded cooled turbine, and a fully variable nozzle, with an electro-hydraulic control system, using sophisticated materials. The bypass variant of the GTX-35 engine being developed for the LCA, will have a thrust of 6,500 kg (dry) and 8,600 kg (after burner).

BHARAT HEAVY ENGINEERING LIMITED (BHEL)

BHEL Haridwar, a public sector company under the Ministry of Industry, is the latest participant in the aeronautics industry. The R&D Wing of the DGCA designed, developed and flight tested the first prototype of the SWATI (LT-1) light trainer aircraft on November 21, 1992. After detailed tests for performance evaluation, a technical certificate for the SWATI has been issued by Indian Institute of Technology, Kanpur and the aircraft has been type certificated. Further design and development work relating to the nose landing gear with metal wing and engine mount structure for fitment of O-235-N2C Lycoming engine has also been completed.

BHEL Haridwar has been issued a production licence to manufacture the SWATI (LT-1). BHEL reportedly received orders for 45 aircraft. However, a production run of 24 of these side-by-side seating aircraft should satisfy the requirements of the Aero Clubs for the next few years. As almost all aero clubs rely financially on the government for their aircraft, the SWATI will have a captive market. Other potential users are pilot training institutes, the Border Security Force and personal aircraft owners. The SWATI has an ideal cruising speed of 185 kmph at an altitude of 2,000 metres, a range of 550 kms and a take off weight of 750 kgs in normal operation.

The DGCA assisted BHEL in the fabrication of the first production model and four aircraft were delivered on March 31, 1993. Unfortunately one aircraft crashed on May 31 when a wing broke off. On June 5, BHEL issued an open tender for twenty-two 116 HP Lycoming engines and Hoffman propellers. However, any production will be halted until the DGCA completes its investigation of the crash.

BHARAT ELECTRONICS LIMITED (BEL)

In 1991-92 the government divested 20% of BEL. In 1992-93, for the first time in its history, BEL's civilian sales (54%) accounted for more than its military sales (46%). Along with Tata Consultancy Services, BEL

has been selected as the nodal agency for the development of a Global Positioning System for Indian applications.

BEL has several foreign collaborations: for updated SFM radar with Ericsson Radar Electronics of Sweden; for naval radars with Contraves of Switzerland; for airport surveillance radars and monopulse secondary surveillance radars with Westinghouse of the USA; for high performance antenna for line of sight microwave units with Siemens Comelit of Italy; and for high grade x-ray tubes with Comet of Switzerland.

In February 1993, BEL set up a joint venture company with Torn-EMI Electronics for marketing BEL-manufactured Cymbeline mortar locating radars to countries in Africa, South-east Asia, West Asia and South America.

TANEJA AEROSPACE & AVIATION LTD (TAAL)

TAAL has entered into technical agreement with Partenavia, a subsidiary to well-known Italian aerospace group Alenia, to build, under licence, a 7-seat twin engine piston aircraft and an 11-seat turbo prop aircraft (P-68 and Viator). Partenavia will initially supply two complete aircraft kits, one each of P-68 and VIATOR as prototypes, for assembly. The latter will have a maximum speed of 320 kmph and be capable of landing on a 500- metre unprepared strip. TAAL is building a factory and airstrip on an 120-acre site at Hosur (60 kms southeast of Bangalore). The cost of the project is Rs. 270 million.

The 7-seater will sell for Rs. 19 million, and the 11-seater will cost Rs. 42.5 million. Operating costs are as low as Rs. 4,500 per hour, inclusive of fuel, crew, maintenance and depreciation. TAAL plans to target the corporate market first, then look at the private air taxi market. Production capacity is planned to be 24 aircraft per year (breakeven is 2.5 aircraft per year). TAAL has already received enquiries from TELCO (Jamshedpur), Suman Motels, Kulkarni, Black and Decker, Garware Wallropes, Finolex, and Mardia Chemicals.

TAAL is also discussing a production agreement with NAL for the NAL-LA and may become a partner in NAL's LTA project.

GUJARAT COMMUNICATIONS AND ELECTRONICS LIMITED (GCEL)

This Gujuart State Government undertaking, based in Baroda, has recently won a National Airports Authority (NAA) tender valued at Rs. 150 million to supply 15 Distance Measuring Equipment (DME) units. GCEL is in the process of executing a previous order worth Rs. 170 million for Doppler VHF Omni Range (VOR) equipment. GCEL has established itself as a major Indian manufacturer supplying 23 instrument landing systems, 6 VOR, 27 low and high power DME, 40 direction finders and the Omega wind finding system, with a value of Rs. 500 million to the NAA, Navy and Airforce. In 1992-93, GCEL had a turnover of Rs. 820 million.

KIRLOSKAR GROUP

A large Indian industrial group which is interested and has the potential for diversifying into the aerospace field is the reputed private sector group, Kirloskar. Based in Pune, it has indicated a good deal of interest in the past but nothing has been heard of its definite plans. Kirloskar, in collaboration with a few other large industrial groups based in Pune, has an aviation department to operate and maintain a fleet of corporate aircraft. See Kirloskar under Corporate Aircraft in Appendix .

MAINTENANCE OF CIVIL AIRCRAFT

Keeping in view the rapid growth in comercial aviation in India, HAL has stepped up its involvement in this field. As military aviation the world over may not sustain the aerospace industry to the same extent as in the past, HAL has started looking at undertaking maintenance, repair and overhaul work for civil aviation. It now carries out in situ repair of aircraft for Air-India, Indian Airlines and Vayudoot, as well as undertaking sub-contracts from a few leading aircraft manufacturers in the world.

HAL is currently assisting Air-India in Section 41 modification of its Boeing 747-200 aircraft, which has recently been introduced by Boeing to improve the fatigue life of the aircraft. HAL and Air-India have jointly

undertaken this repair activity at Air-India's engineering facilities at Bombay with a turnaround time of 12 weeks, and see good potential to offer this service to foreign airlines.

HAL and Indian Airlines have jointly carried out SB 228 Modifications for its Airbus A-300 aircraft. This major modification was introduced by Airbus Industrie to improve the fatigue resistance of the A-300 airframe structure. Repairs have already been completed on three aircraft at Indian Airlines' engineering facilities in Bombay, with a turnaround time of 6 weeks.

HAL has also successfully repaired the damaged nose cowl of an Indian Airlines A-320, and the damaged landing gear door and spoiler of an Air-India A-310. HAL has undertaken the repair and servicing of fan thrust reversers for the CF6-50C2 engine. In collaboration with Indian Airlines and Air-India, HAL has developed plans to jointly establish thrust reverser, landing gear and heavy maintenance overhaul facilities certified by the aircraft manufacturers to provide engineering support for the aircraft flown by India's national airlines. HAL has also carried out a detailed study to set up a third party repair and overhaul complex for other airlines in the region. Such a joint venture would aim to get at least 15% of the USD 2.5 billion business in jetliner refurbishing and overhauling as Singapore is the only other place in the region with such a facility.

As a result of the suppression of private airlines and corporate aircraft activity in India for 30 years or more, there are very few maintenance/service/overhaul facilities catering to the civil market, other than those of the national carriers. Air India and Indian Airlines have large and adequate maintenance facilities. Air-India and Indian Airlines are presently operating Boeing 747-200 and 737-200, and Airbus A-300 and A-320 aircraft. Repair work for these aircraft is being undertaken at the airlines' engineering facilities in Bombay and Delhi. The upgrading of maintenance facilities requires high-tech equipment which has not been procured so far. There has been greater dependence on maintenance facilities abroad. Unserviceable aircraft assemblies and parts are sent abroad for repair and overhaul or manufacturers specialists come from abroad for repairs. However, they have not, and show no signs of wanting, to take in maintenance for India's private airlines. In fact, the government has placed restrictions on "air taxi" operators use of Indian Airlines' maintenance and training facilities.

While there are a small number of private maintenance companies (see Appendix O for details) supporting the limited number of private and corporate owners, the private airlines generally have the size of aircraft (Boeing 737) that these established maintenance companies are unaccustomed to handling. The majority of the private airlines are, therefore, forced to go abroad for their major servicing requirements, particularly C and D checks, while carrying out line maintenance on the airport terminal ramps. In a recent development, however, HAL completed a C check of an East West Airlines B-737 in April, after receiving DGCA approval to carry out major inspections. The work was completed in two weeks with 65 personnel at the Aircraft Division, which is hoping to receive FAA repair station approval.

There is one exception to this: Air Works in Bombay have contracted with Jet Airways to service their Boeing 737-300 (4 are in the country at present). Jet Airways has a technical co-operation agreement with Ansett Airlines of Australia and Air Works personnel have been to Melbourne for training while Ansett have a number of staff on temporary contract at Air Works facility.

Interestingly enough, The Raymond Woollen Mills (chairman - Vijaypat Singhania, pilot and aviation enthusiast) had looked at starting an air taxi-airline. Mr. Singhania has flown as part time flight crew for both East West Airlines and Damania Airways and this experience perhaps led him to conclude that there may be opportunities in aviation maintenance and engineering in India. Consequently The Raymond Woollen Mills are now considering setting up a maintenance base in South India (possibly in Bangalore), and they have plans to add a simulator division, aiming initially at the Boeing 737 market as Indian Airlines will not lease their Boeing 737 simulator. (see The Raymond Woollen Mills under Air Taxi NOC Holders - Not Operating in Appendix I).

There is no doubt that there is a great need for and great scope for maintenance facilities in India, particularly for servicing the private airlines. The International Airports Authority of India (IAAI), which controls the five international airports (Bombay, Delhi, Calcutta, Madras, and Trivandrum), and the National Airports Authority (NAA) have both stated that they are willing to rent out space for hangars where available, even though their past record of such willingness has not been exemplary.

However, in certain cases, Bombay in particular, there is an extreme shortage of space available and in other cases the military or another public sector organization (such as HAL in Bangalore) may control the airport

where they are often not as amenable to requests for space. In reality, therefore, the choice of facility positioning may be somewhat limited. Despite this, necessity will overcome these limitations and available space will be found. Additionally, the demand for maintenance will increase with the expected growing number of aircraft on dry lease or purchased, and this will cause access to, and costs of, maintenance to become a factor in competitiveness.

ENGINES AND SPARES

There are good facilities in India for piston engine overhaul such as at the Bombay Flying Club. However, there are no facilities for small turbine overhaul. There are a number of small operators importing spare parts. Among the larger of them, and professing to be dealers for a number manufacturers, are Cama Aviation Ltd, Bombay and Atherton Eng., Calcutta (See Appendix O).

AVIATION FUEL

Aviation turbine fuel (ATF) is supplied by three corporations in India: Indian Oil Corporation; Bharat Petroleum Corporation; and Hindustan Petroleum Corporation. All three corporations supply ATF for jet and turbo prop aircraft at the five international airports, Bombay, Delhi, Calcutta, Madras, and Trivandrum. The Indian Oil Corporation supplies ATF at 95% of the NAA's 116 airfields. The retail price for ATF is between Rs. 12 and Rs. 14 per litre. Supply throughout the country is good and all three corporations state that it will continue to be so.

Fuel for piston engined aircraft, Avgas, is not refined in India and is available solely through the Indian Oil Corporation and only at selected airfields - in principal, the state capitals. Avgas is imported variously from Australia, Venezuela, and Italy, depending on price. It is 100 octane LL (low lead). In 1992 the Indian Oil Corporation imported 4,500 kilolitres, which is sold at the reasonable price of Rs. 14.50 per litre. ATF sales effectively subsidise the sale of Avgas, which obviously finds favour with the state governments that use it.

Obtaining Avgas at airfields other than state capitals is difficult and most piston operators maintain their own stock in 45 gallon drums, moved by road transport. The Indian Oil Corporation's Aviation Manager suggests it will continue to import Avgas for at least five years, and will attempt to hold the price close to its current level.

AVIATION MEDIA

There are a number of aviation magazines that report the changes in Indian civil aviation. Four of these in particular have excellent coverage (Subscription details are provided in Appendix P):

INDIAN AVIATION Civil and Military	Weekly
SKYWAYS Aviation Magazine of Asia	Monthly
The STAT Trade Times	Monthly
VAYU AEROSPACE REVIEW	Bi-monthly

As is to be expected, INDIAN AVIATION, being weekly, provides the most up to date information. In addition, there are two national daily English newspapers that have good aviation reporting: The Times of India and Indian Express.

APPENDICES

Appendix - A

ON-LINE INTERNATIONAL CARRIERS

BOMBAY AIRPORT

Aeroflot	Air France	Air India
Air Lanka	Air Mauritius	Alyemada Democratic Airway
Bangladesh Biman	British Airways	Cathay Pacific Airways
Delta	Egypt Airway	Ethiopian Airlines
Gulf Air	Indian Airlines	Iran Air
Iraqi Airways	Kenya Airway	KLM
Korean Air	Kuwait Airways	Lufthansa
Pakistan International Airlines	Royal Nepal Airlines	Saudi Arabian Airlines
Singapore Airlines	Swiss Airways	Syrian Arab Airlines
Turkish Airways	United Arab Emirates	Vayudoot
Yemen Airways	Zambia Airways	

DELHI AIRPORT

Aeroflot	Air France	Air India
Air Lanka	Ariana Afghan Airlines	Bangladesh Biman
British Airways	Delta	Druk Air
Gulf Air	Indian Airlines	Iraqi Airways
KLM	Kuwait Airways	Lufthansa
Malaysian Airlines	Pakistan International Airlines	Royal Jordanian
Royal Nepal Airlines	Saudi Arabian Airlines	Singapore Airlines
Swiss Airways	Syrian Arab Airlines	Thai Airways
Turkish Airways	United Arab Emirates	Uzbekistan Airways
Vayudoot		

CALCUTTA AIRPORT

Aeroflot	Air India	Balkan
Bangladesh Biman	Druk Air	Indian Airlines
KLM	Royal Nepal Airlines	Royal Jordanian
Singapore Airlines	Thai Airways	Vayudoot

MADRAS AIRPORT

Air India	Air Lanka	British Airways
Indian Airlines	Malaysian Airlines	Singapore Airlines
Saudi Arabian Airlines	Vayudoot	

TRIVANDRUM AIRPORT

Air India	Air Lanka	Gulf Air
Indian Airlines		

Appendix - B

MINISTRY OF CIVIL AVIATION

The Ministry of Civil Aviation, has under its administrative control, or reporting to it, the following 11 public sector organisations:

Directorate General of Civil Aviation (DGCA)

See Appendix C

Air-India

See specific section in main report under National Carriers on page 5

Indian Airlines

See specific section in main report under National Carriers on page 6

Vayudoot Limited

See specific section in main report under National Carriers on page 8

Pawan Hans Limited

See specific section in main report under National Carriers on page 9

International Airports Authority of India

See separate report on airports

National Airports Authority

See separate report on airports

Bureau of Civil Aviation Security

Previously a Directorate of the DGCA, it has been a full-fledged independent Department since April 1987, and is responsible for laying down standards of pre-embarkation security and anti-sabotage measures at all airports in India. It is also charged with ensuring implementation of security measures.

Commission of Railway Safety

This statutory body, set up under the Railways Act to investigate rail accidents and ensure safety of rail transport, is under the Ministry of Civil Aviation in order to maintain its independence.

Hotel Corporation of India

It is a wholly owned subsidiary of Air-India. It manages the Centaur Hotels at the Bombay and Delhi airports, as well as the Lake View Hotel in Srinagar and the Juhu Beach Hotel in Bombay. It also manages the flight catering units at the Bombay and Delhi airports.

Indira Gandhi Rashtriya Uran Akademi

Located in Rai Bareilly, it trains 40 Commercial Pilots (Fixed Wing) and 10 Commercial Pilots (Rotary Wing) every year. It uses TB-20 and King Air C-90A aircraft and simulators for flying training instruction.

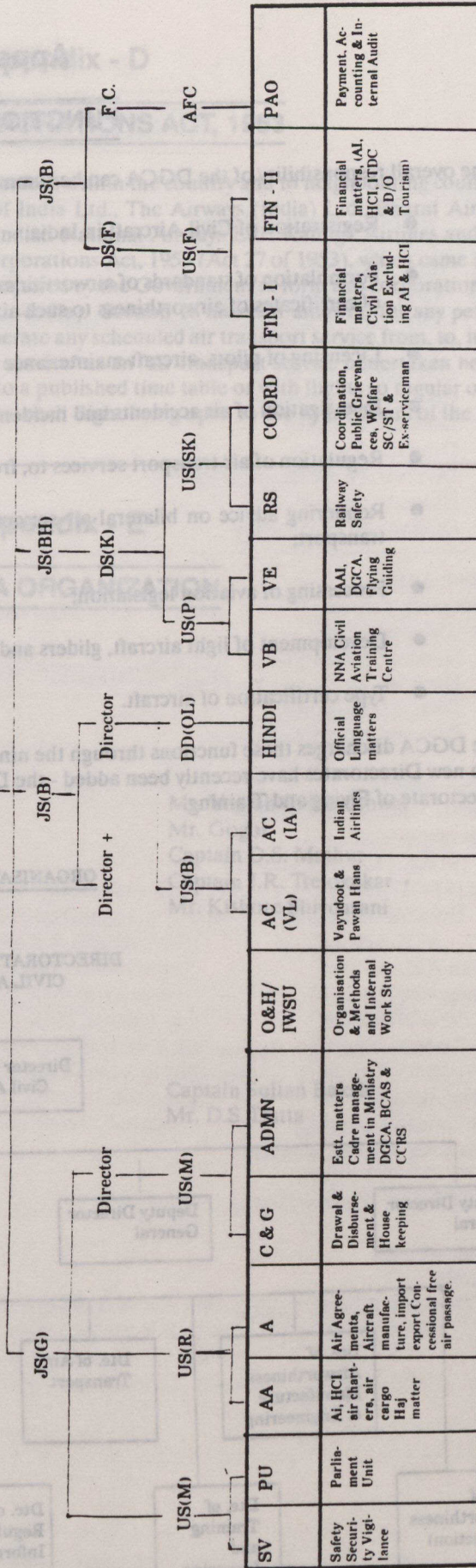
Appendix - B

MINISTRY OF CIVIL AVIATION

MINISTER

MINISTER OF STATE

SECRETARY



+ Attached to the Minister of Civil Aviation & Tourism as O.S.D.

Appendix - C

FUNCTIONS OF DGCA

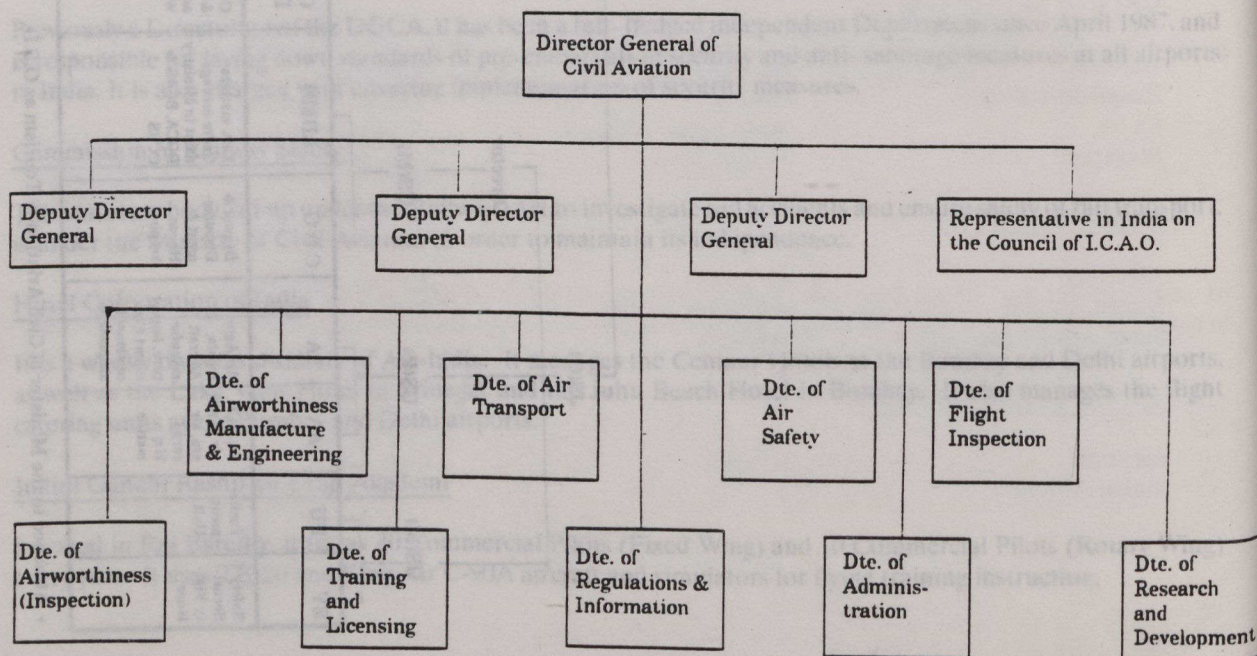
The overall responsibility of the DGCA can be summarised as follows:

- Registration of Civil Aircraft in India;
- Formulation of standards of airworthiness for civil aircraft registered in India and granting of certificates of airworthiness to such aircraft;
- Licensing of pilots, aircraft maintenance engineers and airports;
- Investigation of air accidents and incidents;
- Regulation of air transport services to, from, and within India;
- Rendering advice on bilateral air services agreements and other matters relating to air transport;
- Processing of aviation legislation;
- Development of light aircraft, gliders and winches; and
- Type certification of aircraft.

The DGCA discharges these functions through the nine Directorates shown in the following organisation chart. Two new Directorates have recently been added - the Directorate of Central Examination Organisation and the Directorate of Flying and Training.

ORGANISATION CHART

DIRECTORATE GENERAL OF CIVIL AVIATION



Appendix - D

THE AIR CORPORATIONS ACT, 1953

Before 1953, a number of Indian air companies operated within the country and to neighbouring countries. The air companies were Air India Ltd, Air Services of India Ltd., The Airways (India) Ltd., Bharat Airways Ltd., Deccan Airways Ltd., Himalayan Aviation Ltd., Indian National Airways Ltd., Kalinga Airlines and Air India International Ltd. With the passage of the Air Corporations Act, 1953 (Act 27 of 1953), which came into effect on May 28, 1953, the existing air companies were acquired by the Government to form two corporations - Indian Airlines and Air-India International (renamed Air-India). Section 18 makes it unlawful for any person other than the two corporations or their associates to operate any scheduled air transport service from, to, in or across India. Section 2 defines "Scheduled air transport service" as an "air transport service undertaken between the same two or more places and operated according to a published time table or with flights so regular or frequent that they constitute a recognisably systematic series, each flight being open to use by members of the public."

Appendix - E

AIR-INDIA ORGANIZATION

Air-India

Air-India Building
Nariman Point

Bombay-400 021

Tel: (91-22) 202-4142

Fax: (91-22) 204-8521

Chairman and Managing Director
Acting Director of Engineering
Corodinator and Director of Operations
Deputy Director of Operations
Manager - Special Projects

Mr. Yogesh C. Deveshwar
Mr. Gogoi
Captain D.S. Mathur
Captain J.R. Trelokekar
Mr. Kishore Shivdasani

Air-India

Old Airport

Santa Cruz (East)

Bombay-400 029

Tel: (91-22) 611-1650

Deputy Director of Operations (T)
Deputy Director-Air Safety (Operations)

Captain Sultan Baksh
Mr. D.S. Datta

Appendix - F

INDIAN AIRLINES ORGANIZATION

Indian Airlines
Airlines House
113 Gurudwara Rakabganj Road
New Delhi-110 001
Tel: (91-11) 371-8951
Fax: (91-11) 371-1730, 371-9484

Acting Chairman and Managing Director
Director of Operations
Director of Personnel
Commercial Director
Director, Planning
Director, Finance
Director, Corporate Affairs
Director, Project
Director of Engineering

Mr. Brijesh Kumar
Captain R.K. Kakkar
Mr. S.C. Rastogi
Mr. K. Lal
Dr. G.K. Agrawal
Mr. R.K. Goel
Mr. Daya Narain
Mr. C.S. Vishwanathan
Mr. M.L. Chopra

Indian Airlines
Safdarjung Airport
New Delhi-110 003

Director, Flight Safety
Director, Stores and Purchases
Director, Vigilance
Director, Northern Region

Captain P.M. Jog
V.M. Janardhan
Mr. Parmar (Indian Police Service)
Mr. Avasthi

Indian Airlines
Central Training Establishment
Hyderabad-500 011
Tel: (91-842) 84-6039, 84-0171
Fax: (91-842) 34-3927

Director of Training

Captain L. Lingam

Indian Airlines
Madras-600 027
Tel: (91-44) 43-1070

Director, Southern Region

Mr. A.H. Manambaktiem

Indian Airlines
New Terminal Building
Santa Cruz Airport, Bombay
Tel: (91-22) 612-5739

Director, Western Region

Captain S.T. Deo

Indian Airlines
Calcutta

Director, Eastern Region

Captain J.R.D. Rao

Appendix - G

VAYUDOOT ORGANIZATION

Vayudoot Limited

Safdarjung Airport

New Delhi-110 003

Tel: (91-11) 462-6611, 462-4401

Chairman

Company Secretary & Chief Manager Corporate Systems

Captain Vijay Kumar Trehan

Mr. Amod Sharma

Vayudoot Limited

IGI Airport, Terminal I

New Delhi-110 037

Tel: (91-11) 329-5308, 329-1526 Ext. 2441

Manager Operations

Chief Engineering Manager

Captain S.K. Goswami

Mr. J.G. Jeypaul

Appendix - H

PAWAN HANS ORGANIZATION

Pawan Hans Limited

Corporate Office

Safdarjung Airport

New Delhi-110 003

Tel: (91-11) 463-2538

Fax: (91-11) 461-1801

Managing Director

Executive Director (Operations)

Executive Director (Vigilance)

General Manager (Marketing & Planning)

General Manager (Personnel & HRD)

General Manager (Finance & Accounts)

General Manager (Engineering)

Deputy General Manager (Materials)

Senior Manager (Administration)

Company Secretary and Manager (Legal)

Air Commodore C.M. Singla

Group Captain B.K. Dhir

Mr. S.P. Sharma

Captain G.R. Grover

Mr. G.P. Srivastava

Mr. D.V. Sardana

Air Commodore S. Roy

Group Captain S. Natarajan

Mr. Sanjeev Shrivastava

Mr. Naresh Kumar

Tel: 463-2538

Tel: 463-2271

Tel: 462-7238

Tel: 463-2273

Tel: 462-7058

Tel: 462-7296

Tel: 463-2106

Tel: 462-7058

Tel: 463-2285

Tel: 462-7057

Pawan Hans Limited

Northern Region, Safdarjung Airport

New Delhi-110 003

Tel: (91-11) 461-5711

Fax: (91-11) 461-1801

General Manager (Northern Region)

Deputy General Manager (Engineering)

Deputy General Manager (Operations)

Senior Manager (Materials)

Group Captain V.K. Dhir

Group Captain Y.R. Prasad

Group Captain J.D. Bobb

Wing Commander B. Awasthi

Tel: 461-5711

Tel: 461-5748

Tel: 461-8372

Tel: 462-1283

Pawan Hans Limited

Western Region, Juhu Aerodrome

S.V. Road, Vile Parle (West)

Bombay-400 056

Tel: (91-22) 612-0764

General Manager (Western Region)

Deputy General Manager (Engineering)

Deputy General Manager (Operations)

Senior Manager (Materials)

Group Captain D.C. Kaushik

Wing Cdr. M.K. Kulkarni

Group Captain P.S. Sood

Mr. B.N. Upadhyay

Tel: 612-0764

Tel: 611-7339

Tel: 612-8434

Tel: 615-1136

Appendix - I

PRIVATE CARRIERS

PRIVATE AIR TAXIS - AIRLINES WHICH HAVE STARTED AND FAILED

AIR ASIATIC	Page 34
AIR OCEANIC	Page 34
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OPERATING PRIVATE AIRLINES

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OPERATING PRIVATE AIR TAXIS

AERIAL SERVICES PVT. LTD.	Page 40
DELHI GULF AIRWAYS	Page 40
INDIA INTERNATIONAL AIRWAYS	Page 40
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TRANS BHARAT AVIATION	Page 41

PRIVATE AIRLINES ABOUT TO START

RAJ AVIATION	Page 41
SAHARA INDIA AIRLINES	Page 42
UB AIR	Page 42

AIR TAXI NOC HOLDERS - NOT OPERATING

Page 43

NON-NOC HOLDERS, WHICH HAVE ANNOUNCED PLANS TO START AN AIR TAXI- AIRLINE

Page 45

PRIVATE AIR TAXIS-AIRLINES, WHICH HAVE STARTED AND FAILED

AIR ASIATIC

St. Thomas Mount
Madras-600 018
Tel: (91-44) 432508, 431389
Fax: (91-44) 432184

George Thomas NRI from USA))
International Marketing Executive - Sam Enathu

Based in Madras, it briefly operated a leased Boeing 737 from October 1990 to June 1991, and again very briefly in September 1992.

AIR OCEANIC

Bombay

Briefly operated pilgrim charters to Nasik from Bombay in late 1992 with a wet-leased HS-748 from Vayudoot. At that time, it was negotiating to acquire two Beechcraft 99s for itself.

CONTINENTAL AVIATION

Boeing Terminal Building, Santa Cruz Airport, Bombay-400 099

Tel: (91-22) 615-2257 Ext. 556

Chairman, Mr. Sam Verma (NRI from USA)

Chief Executive, Mr. A.K. Roy

Continental has had a checkered history. It started operations in June 1991 with a 161-seat Boeing 720, but had a short and unsuccessful operation due to poor load factors and a shortage of spares. It operated a Piper Navajo on scheduled service to Surat, which was grounded in October 1991 after a wheels up landing. Continental also has a Jet Commander and a Piper Comanche, which it charters at Rs. 40,000/hour and Rs. 8,000/hour respectively. In 1992, it operated a Fokker F-27 variously as Continental and Goaway (the latter in cooperation with UV1 Beach Holdings), but operations were suspended on May 22, 1993. The company has run afoul of the DGCA a few times. It has moved its offices to temporary accommodation, and it has been reported that it owes the International Airports Authority of India Rs. 1.1 million for landing and parking charges. It may try for a resurrection.

JAGSON AIRLINES

6 Pearey Lal Building, 42 Janpath, New Delhi-110 001

Tel: (91-11) 332-1962, 371-8059

Fax: (91-11) 332-4693

Chairman, Mr. J.P. Gupta

General Manager, V. Sahai

Jagsons started operations from New Delhi in March 1992 with two Dornier 228 aircraft, flying to Shimla and Kulu, with a "Himalayan Darshan" flight on Sundays. It has had various operating problems, and one aircraft was damaged. It was repaired by Hindustan Aeronautics Limited, but HAL were not paid.

In May 1993, the DGCA insisted that all aircraft be equipped with Flight Data Recorders. Jagsons, expecting a cost of CAD 150,000 or more, decided to suspend operations, rather than comply with the directive. The company plans to restart and may look at 50-seat turboprop aircraft.

OPERATING PRIVATE AIRLINES

COMPANY NAME

ARCHANA AIRWAYS LTD.

ADDRESS

41-A Friends Colony East, Mathura Road, New Delhi-110 065

TELEPHONE

(91-11) 684-2001, 684-7760

FAX

(91-11) 684-7762

EXECUTIVES

Chairman

Mr. A.K. Bhartiya

Managing Director

Mr. N.K. Bhartiya

Chief Executive

Captain V.P.S. Sindhu

Executive Director

Vice Admiral (Retd) S.C. Chopra

EMPLOYEES

100

HISTORY & FINANCE

Archana is owned by Bhartiya Vehicles, a company that has been established for 35 years and has extensive business in Czechoslovakia. An NOC was granted in June 1991. It started operations in May 1993, servicing tourist destinations within a 500 km radius of New Delhi.

FLEET

Based in Delhi, it is currently flying to one destination - Kulu.

1 x 17-seat L-410 (A new aircraft, bought from Let Aeronautical of Czechoslovakia). It has three more L-410 on order with the first scheduled to arrive in August. It does its own maintenance at Delhi, with six qualified engineers trained in Czechoslovakia.

EXPANSION

The company plans to expand with aircraft from the same manufacturer, possibly buying a 40-seat L-610.

REPUTATION & NOTES

Plans have always been to be a regional airline, and it intends to exploit currently unserved areas, particularly in northern India.

The company is concentrating on courteous service, short check-in, 5-star flight catering and other up-market services.

COMPANY NAME	CITYLINK AIRWAYS						
ADDRESS	E-22 Poorvi Marg, Vasant Vihar, New Delhi-110 057						
TELEPHONE	(91-11) 688-1360, 688-1361						
FAX	(91-11) 688-1914						
EXECUTIVES	<table border="0"> <tr> <td>Chairman</td> <td>Mr. G.S. Bhambra (NRI-London)</td> </tr> <tr> <td>Vice Chairman</td> <td>Mr. Surjit Babra (NRI-Toronto)</td> </tr> <tr> <td>Manager Planning</td> <td>Mr. Rajiv Bhatnagar</td> </tr> </table>	Chairman	Mr. G.S. Bhambra (NRI-London)	Vice Chairman	Mr. Surjit Babra (NRI-Toronto)	Manager Planning	Mr. Rajiv Bhatnagar
Chairman	Mr. G.S. Bhambra (NRI-London)						
Vice Chairman	Mr. Surjit Babra (NRI-Toronto)						
Manager Planning	Mr. Rajiv Bhatnagar						
EMPLOYEES	Approximately 150						
HISTORY & FINANCE	<p>An NOC was applied for in February 1992. Citylink's initial flight with a BAC 111 was delayed by bureaucratic problems, and it ran into union heckling from state airline employees when it landed at Calcutta in November 1992, because it was using an European crew. The company leased a Fokker F-27 and paid an expensive price to update the aircraft, only to find that the Government had instituted a ban on use of aircraft over 20 years old. The aircraft was returned to the lessor - AFT (Fokker) after only 45 days of operation.</p> <p>Citylink's original investment was Rs. 450 million. Bhambra and Babra are the main stock holders. Mr Babra is an owner of Skylink Aviation of Toronto. No public issue is planned.</p>						
FLEET	<p>Based in Delhi, Citylink flies to three destinations.</p> <p>1 x BAC 111 on wet lease from Rumania Aviation</p> <p>1 x BAC 111 on order for delivery in 2 months</p> <p>Current aircraft has mixed class - 25 business, 75 economy.</p>						
EXPANSION	<p>Long term plans are uncertain because of problems experienced so far, but tentatively looking at a mix of 100 seat and 10-25 seat aircraft. It will probably take a wait-and-see approach until the current lease on its BAC 111 expires in July, because of uncertainty surrounding the Government's policy direction. There has been talk that the airline may close down its operations on expiry of the lease.</p> <p>The company had set up its own maintenance base for the Fokker F- 27 aircraft. The BAC 111 maintenance is provided by the lessor (wet lease)</p> <p>In June 1993, it was reported that Citylink was in the midst of forging an alliance with an Ethiopian airline. Citylink would provide operating assistance and secure aircraft on lease for the joint venture airline.</p>						
REPUTATION & NOTES	<p>Citylink operates reduced fare night flights and is operating at a 65% load factor, which is the break even point. It suffered a loss of \$1.2 million on the F-27 cancellation.</p> <p>The company's airport presentation and appearance could be more professional.</p>						

COMPANY NAME	DAMANIA AIRWAYS LTD.						
ADDRESS	17 Nehru Road, Vakola, Santa Cruz (East) Bombay-400 055						
TELEPHONE	(91-22) 610-2540, 610-3536/40 Ext. 29						
FAX	(91-22) 610-2544						
EXECUTIVES	<table border="0"> <tr> <td>Chairman and Managing Director</td> <td>Mr. Parvez Damania</td> </tr> <tr> <td>Executive Director</td> <td>Mr. V. Damania</td> </tr> <tr> <td>Director</td> <td>Mr. Jehangir Damania</td> </tr> </table>	Chairman and Managing Director	Mr. Parvez Damania	Executive Director	Mr. V. Damania	Director	Mr. Jehangir Damania
Chairman and Managing Director	Mr. Parvez Damania						
Executive Director	Mr. V. Damania						
Director	Mr. Jehangir Damania						
EMPLOYEES	460						
HISTORY & FINANCE	<p>An NOC was granted in August 1992. Damania had originally talked with British Airways, but eventually leased its aircraft from TAP Portugal. Its operations started in March 1993.</p> <p>It is a joint stock company. The parent company is Agritech Hatcheries and</p>						

Foods Ltd. The project entailed an investment of Rs. 260 million. Damania may offer a public issue within the next two months.

FLEET

Based in Bombay, Damania has five destinations.
2 x Boeing 737-200 on lease from TAP
1 x Beech 99 (leased)

EXPANSION

Immediate plans are to dry lease three x Boeing 737-200. Within 3 years Damania would like to re-equip with new aircraft: 30-50 seat turbo props and jets.
It has plans to obtain hangar space in Calcutta for maintenance. Until then it will use Singapore Aerospace.

REPUTATION & NOTES

Its initial service and reputation has been excellent. The aircraft is configured in one class with seating reduced by 9 to 121 to increase pitch. In the first three months of operation, the company boasts of no cancellations and no maintenance delays with an 87% average load factor (break-even 64%). Company policy is to provide outstanding service, and includes the use of items such as chinaware and silver cutlery in its flight service.

COMPANY NAME

EAST WEST AIRLINES

ADDRESS

Sophia, 18 New Kantwadi Road
Off Perry Cross Road, Bandra
Bombay-400 050

TELEPHONE

(91-22) 643-6678 (8 lines)

FAX

(91-220) 643-3178, 642-8388

EXECUTIVES

Chairman	Mr. Nasirudeen Abdul Wahid
Managing Director	Mr. Thakiyudeen Abdul Wahid
Commercial Manager	Mr. C. Rama Chandran
Finance Director	Mr. W. Shihabudeena
Director	Mr. Faisal A. Wahid

EMPLOYEES

2000

HISTORY & FINANCE

Its operations began with one aircraft in February 1992. By November 1992, it had three aircraft, and by June 1993, East West had increased its fleet to 10 aircraft.

The initial financial investment of Rs. 450 million was secured from a consortium of nationalized Indian banks and the IDBI. Its parent company, East West Travel and Trade Links Limited, had a turnover in 1990 of Rs. one billion. Two public issues of Rs. one billion to create a capital base to meet its expansion plans have been previously announced, and rescinded (the latest in February 1993). Another issue had been announced for June 1993, partly to finance its plans for international operations. For the financial year ended March 31, 1993, the company reported a Rs. 150 million profit on turnover of Rs. 5 billion.

In November 1992, it began cargo operations. It now operates to 22 destinations and carries about 150,000 kgs of freight per month from Bombay alone. It has recently signed an agreement with Air India for interlining.

FLEET

Based in Bombay, it has 64 daily flights to 22 destinations, with a monthly capacity of 250,000 passengers on 10 aircraft:

8x Boeing 737-200 and 2x F-27, all on lease from various companies, including GPA and International Air Lease, for which it pays more than US\$ 1.2 million monthly. The average age of its aircraft is 12 years.

The company has had technical cooperation from Singapore Aerospace, British Airways and Gulf Air. It has also signed a maintenance agreement with Aer Lingus.

Recent agreement with HAL in Bangalore to undertake C checks of its B-737s.

EXPANSION

Immediate plans are to dry lease 3 x Boeing 737-300 from GPA, and an Airbus

A-300 (possibly from Egypt Air for use on routes to the Gulf). One year plans are to acquire an additional 10 aircraft. It has a Fokker F-27-500 waiting for customs clearance. East West is also pursuing the possibility of international operations, for which it has already obtained landing rights in Sharjah, Bahrain and UAE.

East West claims to be negotiating with a major USA company to establish major engineering facilities in Bombay and elsewhere in India, which would be capable of handling B-747 aircraft. East West has already acquired land at Trivandrum for an engineering base.

East West also hopes to install a B-737 simulator to train its pilots in-house. The company is close to signing an agreement to form an airline based in the Maldives.

East West has also made preliminary plans to start postal delivery for the Department of Posts.

REPUTATION & NOTES

The company has expanded very quickly and this shows in both its operational service and company presentation - overcrowded corporate offices and ticket counters, sometimes late, and occasionally cancelled flights.

There have been reports recently that the company has not paid its Inland Air Travel Tax to the Central Government; East West has no comment on this issue.

However, the company appears to be strong and will no doubt ride out the bad public relations these points are giving it. It has been the most successful private airline to date, reportedly carrying 80-85% of the 700,000 passengers carried by private airlines in 1992-93. The Indian Airlines' pilots strike gave it a big boost. At one point in early 1993, East West carried 100,000 passengers in 122 days.

COMPANY NAME

JET AIRWAYS (INDIA) PVT. LTD.

ADDRESS

41/42 Maker Chambers III
Nariman Point, Bombay-400 021

TELEPHONE

(91-22) 287-5555

FAX

(91-22) 285-4387

EXECUTIVES

Chairman Mr. Naresh Goyal
Executive Director Mr. Saroj Datta

EMPLOYEES

450

HISTORY & FINANCE

NOC granted February 1992. Paid for an expensive feasibility study by Arthur Anderson, which indicated that there was a market of 23 million passengers annually growing by 12% per year. Operations were started in May 1993.

Jet Airways had originally envisaged significant equity from Gulf Air and Kuwait Airways. With the change in Civil Aviation Ministers, this proposal was turned down as the Government decided that no foreign airlines could hold equity in an air taxi operation. Undaunted, Goyal formed a holding company, Tailwinds, in the Isle of Man, to finance the company. The stock is held by the Goyal family (US\$ 10 million) and one other NRI. Projected costs for the first year are US\$ 20 million.

Goyal's existing company, Jet Air Pvt. Ltd., was formed in 1975 and is the largest GSA in India, representing Air Canada, Singapore Airlines, Air France, Gulf Air, Kuwait Airways, Royal Jordanian, and Philippines Airlines. It has annual billings of over US\$ 100 million.

Jet Airways expects to break even in the first six months and achieve a 6% profit by the end of the first years. Earnings for 1994 and 1995 are projected at Rs. 5.5 billion and Rs. 7.0 billion respectively.

FLEET

Based in Bombay, Jet has 10 Indian destinations.

Four x Boeing 737-300 on lease from Ansett Australia with a technical cooperation agreement for approximately US\$ one million per month. The aircraft were manufactured in 1991, and D Checks are not required until 1998.

COMPANY NAME Maintenance at all destinations is being provided by Air Works India, based in Bombay, which will initially use Ansett engineers.

EXPANSION Plans are to add 4 x B-737 for delivery within 1 year, and to have fleet of 20 aircraft within 3 years. Jet may also look at acquiring B-757 and A-320, as well as smaller aircraft.
If the Indian Government eventually allows foreign equity, Jet may yet tie up with Gulf Air and Kuwait Airways for interlining Gulf traffic.

REPUTATION & NOTES Two classes; business/economy. Initial service has been good. Bad PR from unfortunate incident on maiden flight when crew landed at wrong airport is now forgotten. Load factors are low (50% - 60%) but are increasing (Break-even is 70%).

COMPANY NAME M.G. EXPRESS LTD. (Operating as MODILUFT)

ADDRESS Mezzanine Floor, Hemkunt Towers
98 Nehru Place, New Delhi-110 019

TELEPHONE (91-11) 644-2708, 644-781, 644-8780

FAX (91-11) 644-7821

EXECUTIVES
Chairman Mr. S.K. Modi
Joint Managing Director Mr. Chandrasekhar Kasani
Joint Managing Director Captain R.L. Kapur

EMPLOYEES 250-300

HISTORY & FINANCE An NOC was granted in August 1992. The company talked with Genesis Aviation and G.E. before signing a technical cooperation agreement with Lufthansa. Its operations were started in May 1993.
The parent company is Modi Threads. Project investment was Rs. 500 million. An M.G. Express Rs. 240 million public issue is currently open.

FLEET Based in Delhi. Modiluft plans to fly to 28 destinations.
3 x Boeing 737-200 (average age is ten years) on dry lease from Lufthansa for DM 102,000 per aircraft per month. Under its technical cooperation agreement, Lufthansa is providing maintenance, training and spares. Line maintenance is presently being carried out on the ramp.

EXPANSION 4 x Boeing 737-400 by October 1993. The company plans for total of 10 x B-737 within 1 year. Future plans are to stay with B-737 aircraft. Any change would be to larger not smaller aircraft.
The company has received landing rights at Dubai and Sharjah airports, but is waiting for necessary clearances from the Indian Government before operating to these destinations.

REPUTATION & NOTES Three classes: first, business, economy. Initial operations have been slightly erratic. Service is efficient (Lufthansa) and adequate. Lufthansa staff complain of cost cutting in certain operating situations (i.e. no walkie talkies at airports for ground staff).
Like Jet Airways, Modiluft had also envisaged an equity stake by a foreign airline. It is possible that Lufthansa may pick up a financial stake if the Indian Government should allow it.
There are also conflicting reports that Lufthansa are not keen on the Lufthansa image being used so obviously.
Some analysts have suggested that Modiluft may have difficulty in achieving its hoped for success, for a number of reasons, including: its erratic start-up performance; its low load factors to date; its inexperienced GSAs; and its B-737 three-class layout - 8 first class seats, 42 business and 57 economy.
Modiluft is looking to sign an agreement with Amadeus to provide better handling of reservations.

OPERATING PRIVATE AIR TAXIS

COMPANY NAME AERIAL SERVICES PVT. LTD.
ADDRESS c/o Indamer Co. Hangar No 1,
Juhu Airport
Bombay-400 054
TELEPHONE (91-22) 611-1352, 611-5661
FAX (91-22) 611-3626
EXECUTIVES Managing Director Mr. Richard Koszarek

(See listing under Corporate Aircraft Operators in Appendix K)

COMPANY NAME DELHI GULF AIRWAYS SERVICES PVT. LTD.
ADDRESS Safdarjung Airport
New Delhi-110 003
TELEPHONE (91-11) 463-1170
FAX (91-11) 463-1180
EXECUTIVES Chairman Mr. Raghuraj
Director & Chief Pilot Captain Vinod Kumar
Engineering Manager Mr. V. Sindhu

EMPLOYEES 35
HISTORY The company has been operating helicopters on charter for 10 years, and obtained an air taxi permit in March 1990.
FLEET Based in Delhi, the company only operates charter flights. It does its own maintenance in its own hangar. Charter Rate: Rs. 30,000 per hour
2 helicopters 1 x Alouette III
1 x AS 350 B
EXPANSION Plans are to acquire a larger helicopter and possibly an 8-10 seat executive jet on wet or dry lease.

COMPANY NAME INDIA INTERNATIONAL AIRWAYS (P) LTD.
ADDRESS 710 Arunachal, 19 Barakhamba Road
Connaught Place, New Delhi-110 001
TELEPHONE (91-11) 371-1646, 371-6636, 372-1064
FAX (91-11) 372-1951, 332-7707
EXECUTIVES Chairman Mr. Surinder Gill (NRI London) .PM 0
Managing Director Air Vice Marshal I.D. Bhalla

EMPLOYEES 22
HISTORY The company commenced operations as air taxi in March 1990, with a BAe 125 aircraft.
FINANCE The stock is closely held, presumably by Mr. Gill.
FLEET Based in Delhi, it was operating a BAe 125 and a Bell 206B Jetranger, until the helicopter had an accident in 1991.
India International Airways operates charter flights throughout India. The charter rate is US\$ 2,000 per hour.
EXPANSION Its plans are to acquire more aircraft. It is looking at the Beech Kingair 200, the Cessna 421 Golden Eagle, and the Bell 206B Jetranger (replacement).

COMPANY NAME MESCO AIRLINES LIMITED

ADDRESS H-1 Zamrudpur Community Centre
Kailash Colony, New Delhi-110 048

TELEPHONE (91-11) 642-5914, 642-3218, 646-0495

FAX (91-11) 646-3607

EXECUTIVES Chairman Mr. J.K. Singh
Managing Director Mrs. Rita Singh
General Manager-Marketing Wing Cdr. A.K. Sharma
General Manager-Projects Mr. David Martin

EMPLOYEES 40

HISTORY An NOC was obtained in December 1990.
The company currently operates helicopters for crop spraying. Its parent company is the Mesco Group of Industries, an export company.

FLEET Its present operating base is Bombay.
2 x Hiller crop spray helicopters

EXPANSION The company has plans to acquire fixed wing aircraft for charter operations, possibly a Cessna Caravan and a 30-50 seat aircraft. It is also contemplating a Bell 206B Longranger. Both passenger and cargo services are planned.
The company also has plans to start a helicopter training school in Goa.

COMPANY NAME TRANS BHARAT AVIATION (P) LTD.

ADDRESS 201 Laxmi Bhavan
72 Nehru Place, New Delhi-110 019

TELEPHONE (91-11) 643-3292, 641-9600

FAX (91-11) 331-3353

EXECUTIVES Chairman Mr. Uday Killachand
Managing Director Mr. P.N. Kumar
Chief Pilot Captain Hanspal
NRI Partner Mr. John Kaul (Geneva)

EMPLOYEES 25

HISTORY Commenced operations in March 1991 with an air taxi permit. It currently has regular flights to Kulu from Delhi, and has operated on the Delhi/Ludhiana/Delhi route as well.

FLEET Based in Delhi.
2 x Beech 99
It bought one from Peterborough, Ontario and one from Portland, Maine. Both 12-seat aircraft are operated on a charter basis at US\$ 850 per hour, on an India wide basis.
Maintenance (all checks, all levels) is done by its own staff.

PRIVATE AIRLINES ABOUT TO START

COMPANY NAME RAJ AVIATION

ADDRESS 27-B Panchratna,
Ground Floor, Opera House
Bombay

EXECUTIVE Chairman, Lalith Sheth

HISTORY Former Continental Aviation partner in Goaway. Raj has looked variously at operating 6 x Fairchild Metros, leasing 2 x B-737s from Ansett Australia, and

buying a Fokker F-27. At the end of June it was reported that Raj planned to start operations on August 1 with aircraft leased from Ansett.

FLEET

4 x Fokker 50 on dry lease from Ansett.
Maintenance will be done by HAL (Nasik Division)

COMPANY NAME

SAHARA INDIA AIRLINES

ADDRESS

7th Floor, Ambadeep
14 Kasturba Gandhi Marg
Connaught Place, New Delhi-110 001

TELEPHONE

(91-11) 332-6851/852/853/856

FAX

(91-11) 332-6858

EXECUTIVES

Chairman Mr. Subrata Roy
Director Mr. J.B. Roy
Chief Commercial Controller Mr. U.K. Bose

EMPLOYEES

Approximately 200

HISTORY & FINANCE

An NOC was obtained in October 1991. The company has had various plans to import aircraft, first a Yak 40 and then a Boeing 757. The DGCA advised Sahara that it thought the B-757 was too advanced for the company. Sahara, therefore, is now planning to acquire a B-737.
The company announced its start in late 1992. Since then there have been a number of false starts.

The parent company is Sahara India, a diversified enterprise involved in finance, housing, magazines, papers, and TV, with a turnover of US\$ 200 million.

FLEET PLANS

Based in Delhi, its present plans are to import 2 x Boeing 737-200 in June 1993 on a dry lease from Polaris. The company hoped to start operations during last week of June, and already has approximately 200 employees on the books and will have 450 on start-up.

Destinations initially will be Bombay, Calcutta, Madras and Bangalore.

The company has its own maintenance staff. C and D checks will be carried out in Hong Kong.

Future plans are to have a total of four large aircraft, and six 30-40 seat turbo prop aircraft.

COMPANY NAME

UB AIR PRIVATE LIMITED

ADDRESS

205-206 Embassy Chambers
Vittal Mallya Road
Bangalore-560 001

TELEPHONE

(91-812) 214903, 214904

FAX

(91-812) 214890, 218112

EXECUTIVES

Vice President and CEO Mr. N. Gopala Rao
Executive Vice Chairman Mr. Subhash R. Gupte

HISTORY

UB Air was originally started by a takeover of Maneckji Aviation in 1986. It operated in 1992 with a Dornier 228, but the aircraft had wheels up landing and operations terminated. Rajan Jetly, the former Chairman of Air-India, joined UB Air in February 1993. The company is planning to restart operations again in October with its repaired Dornier 228.

FLEET

1 x Dornier 228

EXPANSION

It has plans to acquire an Airbus A-300 B4 on lease with a buy back option

AIR TAXI NOC HOLDERS - NOT OPERATING

Including aircraft endorsed on NOC, current status, and future plans or announcements.

AIR SAREENA c/o D.S. & Sons Travel Agency 85/46 Waroda Road 1st Floor, Bandra (West) Bombay-400 050 Tel: (91-22) 643-8464, 640-1848	Fokker F-27, Inactive
APARNA AVIATION A-50 Friends Colony, Main Mathura Road New Delhi-110 065 Tel: (91-11) 3755238/126, 3711280, 3718867 Fax: (91-11) 3710441 Chairman, Dhirendra Brahmachari	F-50 helicopter, Inactive
BARON AIR 9 Sagar Apartments 6 Tilak Marg, New Delhi Tel: (91-11) 378-2474 Fax: (91-11) 385-149 Chairman, A.S. Selhi Director Engineering, Air Cmde M.K. Bidani	BAC-111, Plans on hold
BENZ AIR 69/71 Janjekar Street, Crowford Market Bombay-400 003	Fokker F-28, Inactive
CAPITAL AIR 7/8 Windsor Man. Janpath, New Delhi	Boeing 737, Not at address
CHERAN AIRLINES 6.25 Art College Road, Coimbatore	Inactive
DEEKSHA HOLDINGS 401 World Trade Tower Barakhamba Road, New Delhi-110 001	Own a Beech Kingair C90 and a Bell 47G helicopter. Not operating and no immedi- ate plans
G.M.M. CO. LTD. 71 Nehru Place, New Delhi Mr. S.P. Singh	Piper, Looking at regional routes
HIMALAYAN AIRWAYS c/o University Travel Services Inc. 39 G.T. Road, Jallandar, Punjab	Not at address
H.T.S. TOURS 8-9 H Block, Connaught Place New Delhi-110 001 Tel: (91-11) 332-9984 Chairman, Mr. Joginder Sanger (NRI - London)	Inactive
JAINSON AIR SERVICES E 42-43 Connaught Place New Delhi-110 001 Tel: (91-11) 332-5152, 332-9509, 332-7878 Fax: (91-11) 332-5122 Managing Partner, Mr. Arun Kumar Jain	Had earlier proposed to lease MI-8 helicop- ter. All plans on hold

<p>KOVAI AIRWAYS 61 Athipalayam Road Ganapathy Post, Coimbatore</p>	<p>Beech 99, Inactive</p>
<p>ORIENTAL AIRLINK PRIVATE LTD. Suite 6, Hotel Janpath New Delhi-110 001 Tel: (91-11) 332-0219, 332-0119 Fax: (91-11) 371-3409 Director, Captain Ajay Pal Director, Mr. Salil Ghose</p>	<p>Chartering Bulgarian aircraft on ad hoc charters</p>
<p>PASHPATI AVIATION M-41 Connaught Circus, New Delhi</p>	<p>Helicopter, Inactive</p>
<p>PHOENIX AIRLINES 27 Anandha Road Alwarpet, Madras 204, Avg Bhawan, Middle Circle M-3, Connaught Place New Delhi-110 001</p>	<p>B-737, Inactive</p>
<p>THE RAYMOND WOOLLEN MILLS 301-302 Arunachal, 19 Barakhamba Road New Delhi-110 001 Tel: (91-11) 331-4588, 331-4043 Fax: (91-11) 371-2273 Resident Director, Mr. Faiz M. Ali</p>	<p>No air taxi at present, possible plans to establish a maintenance and training facility (see separate listing under Corporate Aircraft Operators in Appendix K)</p>
<p>SABARMATI AIR A-2 Akash Deep, Santa Cruz East Bombay-400 055</p>	<p>Inactive</p>
<p>SARAYA AVIATION 11 Pansheel Shopping Centre New Delhi-110 017 Tel: (91-11) 643-1747, 643-8227 Assistant Manager (Commercial), Mr. Sushanta Chowdhury</p>	<p>B-58 & 35 aircraft for own use only</p>
<p>SITANI AIRLINES (Division of Trinity International Ltd.) 501 Laxmi Bhawan, 72 Nehru Place New Delhi-110 019 Tel: (91-11) 641-7753, 643-0189 Fax: (91-11) 647-2127 Chairman and Managing Director, Mr. Uma Shankar Sitani</p>	<p>Proposed to operate fixed wing aircraft. No immediate scheduled operations are planned</p>
<p>SPINNER AVIATION 10 North Mohajhari Road Ambazari, Shivaji Nagar Nagpur-10</p>	<p>Proposed to lease a Piper PA-31-350 Navajo Chief. No immediate plans</p>
<p>TRIDENT AIRWAYS 205 Sarvpriya Apartments Sarvpriya V, New Delhi</p>	<p>Kingair C-172, Inactive</p>
<p>VENUS AIR 421, 6 Nehru Place, New Delhi</p>	<p>B-737, No plans</p>

VISETA AIRWAYS

606 Vishal Bhawan, 95 Nehru Place
New Delhi-110 019

Tel: (91-11) 641-6942

Fax: (91-11) 643-0110

Chairman, Vijaya Sethaputra (NRI - Indonesia)

Managing Director - Captain K. Chadha

Director of Operations - Captain B.K. Bhasin

Director of Finance - Arun Kapoor

Director of Engineering - G. Lal

Commercial Director - S.K. Seth

Proposed to lease helicopter. May look at
Turbo props (F-50 and F-100) in the future

**NON-NOC HOLDERS, WHICH HAVE ANNOUNCED
PLANS TO START AN AIR TAXI-AIRLINE**

AIR PENINSULA

68, World Trade Centre

Cuffee Parade, Coloba, Bombay

Chairman and Managing Director - Vinnie Kurup

Recently moved offices. Have announced yet again, as recently as 15 June 1993, an intended start with 2 x Boeing 737-200 on wet lease from World Aviation Service. An NRI from the USA is reported to be providing the Rs. 200 million financing.

ASIA FUNDS LTD.

246 Gulmohar Park, New Delhi

Mr. P.C. Govil

In 1992, proposed to operate a Beachcraft Super King, a BAE 125- 800 and a Bell 421 SP helicopter.

C.I.F.C.O. TRAVEL LTD.

Regent Chambers, 208, Jamnalal Bajaj Marg

Nariman Point, Bombay 400 021

Tel: (91-22) 230169, 230193, 230281

Fax: (91-22) 204-9686

Chairman, Mr. Bhupen Dalal

CITY LINE AIRWAYS LTD.

G-17, Marina Arcade, Connaught Place

New Delhi-110 001

In 1992, proposed to operate an AN-24 and lease a ROM BAC 1-11.

ELBEE EXPRESS SERVICE

75 Nehru Road, Vile Parle (East), Bombay-400 099

Tel: (91-22) 612-4449, 611-4404

Fax: (91-22) 611-6727, 611-0328

Chairman and Managing Director, Mr. Sandip Shah

Vice President-Marketing and Sales, Mr. Ashis Nain

An international service partner of United Parcel Service

INDIAN AVIATRONICS

16 Barakhamba Marg, New Delhi

Tel: (91-11) 371-3262

Mr. Dev Mohan Gupta

Completing study; may look at 4 - 6 50-seat turbo prop aircraft.

KADUR AIR PVT LTD

Kadur, Mylasandra Village, R.V.V. Post, Bangalore-59

Propose to lease Beachcraft King Air and Turbo Twin Turbo-Engine

MANECKJI AVIATION

Bombay

MEGAPODE AIRLINES
c/o Helicopter Services Pvt. Ltd.
Hangar No. 8, Juhu Airport, Bombay
Propose to lease Boeing 737-200 and BAE 145

PATEL COURIERS

ROYAL STAR AIRLINES
(Airtrade - I.M.S.Oberoi)
Announced in January 1993 that it would start operations in mid- 1993 with Boeing aircraft.

SEVEN HILLS AVIATION
3 Goomes St., Madras 600 001

SPAN AVIATION
Vishnu Darshan, 1132/3 Shivajinagar,
F.C. Road, Pune-411 016
Tel: (91-212) 344481, 342478
Fax: (91-212) 348309
Executive Director, Group Captain Niteen M. Gupte
Looking at Cessna Caravan

SUPER HOUSE GROUP
71A Jamau, Kanpur-208 010
Tel: (91-512) 42773

TROPICAL AIRWAYS PVT. LTD.
35/214 Power House Road,
Palarivatham, Cochin-25
In 1992, proposed to lease two Boeing 737, one executive jet and one helicopter

WODEYAR
Mr. Srikanta Datta Narasimharaja Wodeyar
(Former Prince of Mysore and Member of Parliament)
With the backing of NRIs in the UK and Far East, plans to start operations in November 1993 with six aircraft - three purchased and three leased. Considering purchase of Saab aircraft at cost of Rs. 270 million each. Leased aircraft would cost Rs. 85,000 per month. Operations are to be based in Hyderabad and Visakhapatnam, from where it will operate on 12 routes. Also proposes to acquire two 50-65 seat jet aircraft for longer haul operations.

Appendix - J

FLYING TRAINING ESTABLISHMENTS

AERO CLUB OF INDIA
Safdarjang Airport, New Delhi 110 003
Tel: (91-11) 462-1341, 462-0191
President - Captain Satish Sharma
Secretary - Mr. V. Rama Subramanyam
The Aero Club of India is an umbrella organization for 24 flying clubs.

AERO CLUB AFFILIATES

(Including type of ownership and aircraft.)

AMRITSAR AVIATION CLUB Raja Sansi Airport, Amritsar, Punjab	State Government 2 - 3 aircraft
ANDHRA PRADESH FLYING CLUB Begumpet Airport, Hyderabad-500 019	State Government 2 - 3 aircraft

ASSAM FLYING CLUB B. Borooah Road, Ulubari, Guwahati-7	State Government 2 - 3 aircraft
BANASTHALI VIDYAPITH FLYING CLUB Banasthali Vidyapith P.O., Via Jaipur	Private 2 - 3 aircraft
BIHAR FLYING CLUB Civil Aerodrome, Patna	State Government 7 - 8 aircraft Pushpak & Cessna 152
BOMBAY FLYING CLUB Juhu Airport, Bombay 400 049 Tel: (91-22) 612-3394 Secretary - Mr. J.D. Sukhia Chief Flight Instructor (CFI) - Captain Manha Future plans - Twin engine aircraft	Private 5 aircraft PA 18 & Cessna 152
COIMBATORE FLYING CLUB Civil Aerodrome, Coimbatore-641 014 Tel: (91-422) 573306 Chairman - Mr. L.G. Ramamurthi CFI - Captain P. Ganapathiappan	Private 6 aircraft Pushpak, Chipmunk & Cessna 152
GOVERNMENT FLYING TRAINING SCHOOL Jakkur Aerodrome, Yelamanka Post, Bangalore-560 064 Tel: (91-812) 332251 Principal & CFI - Captain S.M. Patil Future plans - Instrument procedure trainer and twin engine aircraft.	State Government 6 aircraft Pushpak, Cessna 152 & 172
GOVERNMENT FLYING TRAINING CENTRE Amausi Airport, Lucknow	State Government 2 - 3 aircraft
DELHI FLYING CLUB Safdarjang Airport, New Delhi-110 003 Tel: (91-11) 618931 Manager - Captain Satish Sharma CFI - Captain M.S. Beniwal	Private 3 aircraft Pushpak & Cessna 152
FLYING TRAINING INSTITUTE Home (Transport) Department Behala Airport, Calcutta-700 034	State Government 4 - 5 aircraft
GUJARAT FLYING CLUB Civil Aerodrome, Harni Road, Baroda-390 006 Tel: (91-265) 552631 CFI - Captain Homi R. Mistry Future Plans - Wish to expand, but have no finances.	Private 6 aircraft Pushpak, PA 18 & Cessna 152
HISAR AVIATION CLUB Civil Aerodrome, Hisar, Harayana Tel: (91-1662) 74356 Manager & CFI - Captain A.S. Bhati Future plans - single engine simulator.	State Government 3 aircraft Pushpak & Cessna 152
JAMSHEDPUR CO-OP FLYING CLUB Sonari Aerodrome, Jamshedpur-5, Bihar	Private 3 aircraft
KARNAL AVIATION CLUB Civil Aerodrome, Karnal, Haryana	State Government 2 - 3 aircraft
KERALA AVIATION TRAINING CENTRE Civil Aerodrome, Trivandrum-695 024	State Government 2 - 3 aircraft

LUDHIANA AVIATION CLUB Civil Aerodrome, Ludhiana, Punjab	State Government 3 - 4 aircraft
MADHYA PRADESH FLYING CLUB Civil Aerodrome, Indore	Private 3 - 4 aircraft
MADRAS FLYING CLUB LTD Madras Airport, Madras-600 027 Tel: (91-44) 234-1709 Treasurer/Secretary - Mr. A. Natarajan CFI - Captain M.T. George	Private 7 aircraft Pushpak & Cessna 152
NAGPUR FLYING CLUB Sonegaon Aerodrome, Nagpur-5, Maharashtra Tel: (91-712) 525893 Ext. 496 CFI - Captain V. Ramamurthy Future Plans - Obtaining 2 additional Cessna 152s from USA.	State Government 3 aircraft Pushpak, Luscombe & Cessna 152
NORTHERN INDIAN FLYING CLUB Civil Aerodrome, Jallunder-144 005, Punjab	Private 4 aircraft
ORISSA GOVERNMENT AVIATION TRAINING INSTITUTE Civil Aerodrome, Bhubaneswar CFI - Captain R.B. Mohapatra	State Government 2 - 3 aircraft
PATIALA AVIATION CLUB Civil Aerodrome, Patiala-147 001, Punjab	State Government 2 - 3 aircraft
RAJASTHAN STATE FLYING SCHOOL Sanghaner Airport, Jaipur	State Government 3 - 4 aircraft

TRAINING ESTABLISHMENTS NOT AFFILIATED TO THE AERO CLUB OF INDIA

CO-OP HIND FLYING CLUB Civil Aerodrome, Allahabad, Uttar Pradesh	
CO-OP HIND FLYING CLUB Civil Aerodrome, Kanpur, Uttar Pradesh	
BANGALORE AERONAUTICAL TECHNICAL SERVICES PVT. LTD. 61 Cambridge Rd., PO Box 806, Upsoori, Bangalore-560 008 Received air taxi NOC in February 1993	Private 1 Cessna 152
UDAN RESEARCH AND FLYING INSTITUTE (PVT) LTD. 126 Kanchan Bagh, Indore-452 001 Tel: (91-731) 23416, 38773, 5493 Fax: (91-731) 413809, 443232, 492250 Chairman - Mr. Chandrakant Mehta (17 Appleby Road, Etobicoke, Ontario M9B 4Z8) Managing Director - Captain B.K. Tongia Chief Executive - Miss Milan Sangha Director - Mr. Y.K. Sethi (577, Anand Bhawan, M.G. Road, Indore; Tel: (91-731) 434572, 22966) Future plans - Received air taxi permit in September 1992. Propose to operate Cessna 310 and Beech C-90 in near future. Concentrating on charter flights and training with a definite view to expand.	Private 3 aircraft Cessna 152 & 172
INDIRA GANDHI RASHTRIYA URAN AKADEMI Furstaganj Airfield, District Rae Bareli, Uttar Pradesh-229 302 Tel: (91-535) 802050 Fax: (91-535) 802094 Director - Air Vice Marshal S. Subbaramu CFI - Captain T.K.R. Nair	Government of India 7 x Trinidad TB 20 2 x Robinson R22 heli. 2 x Beech Kingair C 90

Appendix - K

CORPORATE AIRCRAFT OPERATORS

Aerial Services (P) Ltd.	Bombay	Page 49
Bajaj Auto Ltd	Pune (see Kirloskar)	Page 52
Bharat Earth Movers	Bangalore	Page 49
Bharat Forge	Pune (see Kirloskar)	Page 52
Coal India Limited	Calcutta	Page 50
Dr. Jain Airways	New Delhi	Page 50
Dumez Sogea Borie-Sae	New Delhi	Page 50
Essar Gujarat Ltd	Bombay	Page 50
Geological Survey Of India	Bangalore	Page 51
Hindalco Industries	Bombay	Page 51
Indian Iron And Steel Company	Burnpur	Page 51
Indian Metals & Ferro Alloys	Bhubaneshwar	Page 51
Kalyani Steel	Pune (see Kirloskar)	Page 52
Kirloskar Group	Pune	Page 52
Kudremuch Iron Ore Company	Mangalore	Page 52
Lakshmi Mills Limited	Coimbatore	Page 52
Mahindra & Mahindra	Bombay	Page 52
National Remote Sensing Agency	Hyderabad	Page 53
O.N.G.C.	Dehradun	Page 53
The Raymond Woollen Mills	Bombay	Page 53
Reliance Industries Ltd.	Bombay	Page 54
Soundaraja Mills Limited	Madras	Page 54
Steel Authority Of India	Bokaro	Page 54
Steel Authority Of India	Ranchi	Page 54
Sundram Financing	Goa	Page 54
Tata Iron And Steel Company	Jamshedpur	Page 55
UB Air Private Ltd	Bangalore	Page 55

COMPANY NAME

AERIAL SERVICES PVT. LTD.

ADDRESS

c/o Indamer Co. Hangar No 1, Juhu Airport, Bombay-400 054

TELEPHONE

(91-22) 611-1352, 611-5661

FAX

(91-22) 611-3626

EXECUTIVES

Managing Director

Mr. Richard Koszarek

HISTORY

An Air Taxi permit was granted in January 1993. Indamer has been the Beechcraft dealer in India for more than 30 years. The company has been very successful in importing corporate aircraft by selling new ones to State Governments, which are allowed to buy aircraft. When the State Government upgrades to a new aircraft, the used aircraft, being on the Indian register, is able to be sold to a corporate customer.

FLEET

Although its aircraft operate on an air taxi permit, they are on permanent lease to individual companies.

1 x Beechjet 400 on lease to TELCO.

1 x Beechjet 400 arriving June 1993, will be on lease to the Oswal Group, Delhi.

The company has its own well-established, and respected maintenance shop.

EXPANSION

The company would like to import 3 more Beech aircraft this year (1 x Beech 1900 and 2 x Kingair). It is still finding difficulty with import permits.

COMPANY NAME

BHARAT EARTH MOVERS LIMITED

ADDRESS

BEML Soudha

TELEPHONE

S.R. Nagar, Bangalore-560 027

FAX

(91-812) 224141

(91-812) 226883

EXECUTIVES	Chairman and Managing Director Director-Marketing Aviation Manager	Mr. T.V.S. Sastry Brigadier E.S.K. Murthy Squadron Leader A. Chopra
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FLEET	1 x Alouette III helicopter Flies 150 hours per year for the Chairman and board of directors. Maintained by HAL, Bangalore
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COMPANY NAME	COAL INDIA LIMITED
ADDRESS	10 Netaji Subhash Road, Calcutta - 700 001
TELEPHONE	(91-33) 20-3717
FAX	
EXECUTIVES	

FLEET	1 x Beech Baron 58
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COMPANY NAME	DR. JAIN AIRWAYS
ADDRESS	A-39 NDSE Part II New Delhi-110 049
TELEPHONE	(91-11) 687-7592
FAX	(91-11) 687-3015
EXECUTIVES	Dr. J.K. Jain (A Member of Parliament in the Upper House involved in diverse companies.)

FLEET	1 x Hughes 300 helicopter
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EXPANSION	May look at more helicopters and/or a 6-10 seat twin jet on wet or dry lease. Has not applied for an NOC as yet.
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COMPANY NAME	DUMEZ SOGEA BORIE-SAE
ADDRESS	9th Floor, Arunachal Building 19 Barakhamba Road New Delhi-110 001
TELEPHONE	(91-11) 371-4181/3 (91-11) 371-4184
EXECUTIVES	Resident Director Aviation Manager Chief Pilot

Mr. D. Railton Mr. S. Kumar Captain S.K. Kapoor

FLEET	1 x DHC 6 Twin Otter Under contract with Vayudoot, flies 750 hours per year.
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COMPANY NAME	ESSAR GUJARAT LTD.
ADDRESS	Maker Chamber IV, 13th Floor Nariman Point, Bombay-400 021
TELEPHONE	(91-22) 204-2600
FAX	(91-22) 202-9149
EXECUTIVES	Chairman Aviation Manager

Mr. S.N. Ruia Group Captain K.A.S. Tyagi

FLEET	1 x Beech Kingair B200; maintained by Air Works, Bombay
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EXPANSION	May look at acquiring an executive jet.
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COMPANY NAME **GEOLOGICAL SURVEY OF INDIA**

ADDRESS AMFE Wing
Prestige Complex
2 Church Street
Bangalore 560 001
(19-812) 563288

TELEPHONE
FAX
EXECUTIVES

FLEET 1 x DHC 6 Twin Otter
Based at Bangalore and maintained by Airworks

COMPANY NAME **HINDALCO INDUSTRIES**

ADDRESS Century Bhavan
Dr. Annie Besant Road,
Bombay-400 025

TELEPHONE (91-22) 231217
FAX (91-22) 204-0829
EXECUTIVES Chairman Mr. A.V. Birla
Aviation Manager Mr. V.M. Sand
Chief Pilot Captain S. Mehta

FLEET 1 x Beech Kingair 100
Based at Bombay and maintained by Air Works. Flies up to 100 hours per year as transport for Chairman and President.

EXPANSION Interested in acquiring a Cessna Citation II.

COMPANY NAME **INDIAN IRON AND STEEL COMPANY**

ADDRESS Burnpur - 713 325
West Bengal
(91-) 461-467

TELEPHONE
FAX
EXECUTIVES

FLEET 1 x Beech Queenair

COMPANY NAME **INDIAN METALS & FERRO ALLOYS LIMITED**

ADDRESS Aviation Division
Bomikhal, P.O. Rasulgarh
Bhubaneswar-751 010
(91-674) 480270, 480540
(91-674) 480020

TELEPHONE
FAX
EXECUTIVES

FLEET 1 x Beech Baron 55
1 x Cessna 172
1 x HAL Chetak helicopter

EXPANSION & NOTES Aircraft are used to connect the Group's far-flung factories, mines, warehouses and offices. Plans are underway to utilise and expand the fleet for commercial operations.

COMPANY NAME **KIRLOSKAR GROUP**
BHARAT FORGE
KALYANI GROUP
BAJAJ AUTO

ADDRESS c/o Kirloskar Oil Engines, Aviation Department
Lohgaon Airport, Pune-411 032

TELEPHONE (91-212) 667689, 665053

FAX (91-212) 323208

EXECUTIVES Kirloskar Chief Executive Mr. A.C. Kirloskar
Bharat Forge Chief Executive Dr. N.A. Kalyani
Kalyani Group Chief Executive Mr. B.N. Kalyani
Bajaj Auto Chief Executive Mr. R. Bajaj
Aviation Administrator Group Captain P.J. Jakatdar (Retd)
Chief Engineer Mr. R. Ravindran

FLEET The above groups have combined a number of their companies' corporate aircraft, and administer them under a joint aviation department based at the Pune airport.
The combined fleet consists of 6 Beechcraft:
2 x Kingair C 90
1 x Queenair 80
1 x Duke A 60
1 x Baron 58 P
1 x Baron 55
The aircraft are maintained by the Aviation Department's engineers and by Indamer, Bombay. The expenses are shared by the users on basis of hours flown.

EXPANSION & NOTES Want to re-equip with Kingair C90 aircraft to standardise the fleet. Very professionally run aviation department.

COMPANY NAME **KUDREMUCH IRON ORE COMPANY LTD.**

ADDRESS Panambur, Mangalore 10

TELEPHONE (91-824) 407916

FAX

EXECUTIVES Aviation Manager Squadron Leader L. Mehta (Retd)

FLEET 1 x Alouette III helicopter
Flies 150 - 200 hours per year on company business and VIP trips. Minor maintenance is done by the Bombay Flying Club, while major maintenance is done by HAL, Bangalore.

COMPANY NAME **LAKHSMI MILLS LIMITED**

ADDRESS 348 Avanashi Road, Coimbatore-37

TELEPHONE

FAX

EXECUTIVES

FLEET 1 x Piper PA 23
1 x Cessna 320

COMPANY NAME **MAHINDRA & MAHINDRA**

ADDRESS Gateway Building
Apollo Bunder, Bombay

TELEPHONE (91-22) 202-1713, 202-1031

FAX (91-22) 202-8990

EXECUTIVES

Chairman
 Managing Director
 Director

Mr. K. Mahindra
 Mr. Pitamber
 Mr. A. Mahindra

FLEET

1 x Beech Kingair A90

COMPANY NAME

NATIONAL REMOTE SENSING AGENCY (Department of Space)

ADDRESS
 TELEPHONE
 FAX
 EXECUTIVES

Balanga, Hyderabad-500-037
 (91-842) 279572/6
 (91-842) 278648
 Director

Professor B.L. Deeshatulu

FLEET

1 x DC 3 Dakota
 1 x HS 748
 1 x Beech Kingair B200
 1 x Beech Kingair B300
 Total hours for all aircraft are approximately 1,000 hours per year.
 One of the Beech Kingair's crashed in July 1993.

Aviation Department, Data Aquisition (Aerial)
 Plot Nos 6A&B, IDA Jeedimatla
 Hyderabad-500 855
 Tel: (91-842) 895984
 Fax: (91-842) 278648

General Manager Mr. H.S. Mangat
 Chief Pilot Captain A. Bhalla

COMPANY NAME

OIL AND NATURAL GAS COMMISSION

ADDRESS
 TELEPHONE
 FAX
 EXECUTIVES

Tel Bhavan
 Dehradun-248 003
 (91-135) 28591, 27121/6 Ext. 3852
 (91-135) 25298
 General Manager
 Deputy General Manager

Mr. S.L. Agnihotri
 Captain K.S. Sood

FLEET

3 x Chetak helicopters based at various ONGC business centres throughout India.
 1 x Dornier 228 based at Delhi.
 All aircraft fly approximately 200 hours each per year.
 The aircraft are maintained by AeroCopter Services, Bombay.

COMPANY NAME

THE RAYMOND WOOLLEN MILLS

ADDRESS
 TELEPHONE
 FAX
 EXECUTIVES

J.K. Building
 Narotam Moraji, Ballard Estate
 Bombay-400 038
 (91-22) 261-8321
 (91-22) 262-1419

Chairman Mr. Vijaypat Singhania
 Aviation Manager Captain P.M. Malvankar

FLEET

1 x DC 3
 Mr. Singhania has been looking at executive jets for many years. At one point he had wanted to import a BAe 125, but had difficulty with importation. He has recently decided to buy a Cessna Citation II, and is having better luck with importation. The aircraft should have arrived in India in June 1993.
 Maintenance is done by Air Works, Bombay.

EXPANSION Mr. Singhania is seriously considering establishing a maintenance facility in south India, with a simulator division that would initially offer training for B-737 aircraft.

COMPANY NAME RELIANCE INDUSTRIES LTD.

ADDRESS Maker Chambers IV
Nariman Point, Bombay-400 021

TELEPHONE (91-22) 204-5560, 285-5713

FAX (91-22) 204-2268

EXECUTIVES Chairman Mr. D. Ambani
President Mr. M.N. Chaini

FLEET 1 x Cheetah SA 315 helicopter
The company is importing a BAe 125-700, which is expected in June/July 1993.

COMPANY NAME SOUNDARAJA MILLS LIMITED

ADDRESS 19 Kasturi Ranga Road, Iyengar Road, Madras

TELEPHONE

FAX

EXECUTIVES

FLEET 1 X Piper PA 23

COMPANY NAME STEEL AUTHORITY OF INDIA LTD

ADDRESS Bokaro Steel Plant
BSL, Bokaro Steel City, Bihar-827 001

TELEPHONE (91-6542) 92330, 82300

FAX (91-6542) 82082

EXECUTIVES Managing Director Mr. B. Kashtriya
Aviation Manager Mr. K. Singh

FLEET 1 x Beech Kingair B 200 based at Bokaro.
The aircraft flies approximately 600 hours per year for the Steel Authority of India Corporate Office, the Ministry of Steel, and the Bokaro Steel Plant. Maintenance is done by its own maintenance staff at Bokaro.

COMPANY NAME STEEL AUTHORITY OF INDIA LTD.

ADDRESS Ranchi Plant
SAIL - Hinoo, Ranchi, Bihar-834 002

TELEPHONE (91-651) 300042

FAX (91-651) 300023

EXECUTIVES Aviation Manager Captain B.D. Gupta

FLEET 2 Beechcraft: 1 x Queenair; 1 x Kingair, based at Ranchi.
Maintenance done by its own Aviation Department (21 staff) at Ranchi.

COMPANY NAME SUNDRAM FINANCING

ADDRESS Curtorim Road, Burda, Margao, Goa

TELEPHONE

FAX

EXECUTIVES

FLEET 1 X Beech Kingair C90

COMPANY NAME TATA IRON AND STEEL COMPANY LTD.

ADDRESS Sonari Aerodrome, Jamshedpur, Bihar-831 011

TELEPHONE (91-657) 310093, 23582

FAX (91-657) 24719

EXECUTIVES Managing Director Dr. J.J. Irani
 Manager, Aviation Services Captain R.M. Khanna

FLEET
 1 x Cessna Citation SII
 1 x Beech Kingair C 90
 1 x Cessna 303 Crusader
 1 x Cessna 310
 1 x Beech Bonanza A 35
 Total flying hours per year for all aircraft are approximately 1500 hours.
 The Aviation Department at Jamshedpur has a staff of 35, including pilots,
 engineers and technicians, which do all maintenance.

COMPANY NAME UB AIR PRIVATE LTD

ADDRESS 206 Embassy Chambers, Vittal Mallya Road, Bangalore-560 001

TELEPHONE (91-812) 214903/4

FAX (91-812) 218112

EXECUTIVES Chairman Mr. Vijay Mallya
 Vice President & CEO Mr. N. Gopala Rao
 Chief Pilot Captain K.S. Rajan

EMPLOYEES 25

FLEET
 1 x Gulfstream GIIB
 1 x BAe 125
 1 x Beech Kingair C 90
 1 x Dornier 228
 1 x Chetak helicopter
 2 x Bell 47G helicopters
 Total flying hours for all aircraft are 2300 hours per year, serving all companies
 within the UB Group.
 All maintenance checks are done by its own staff at Bangalore.
 (See separate listing under Private Airlines About to Start in Appendix 1)

Appendix - L

STATE GOVERNMENTS OPERATING AIRCRAFT

Union Territory of Andaman and Nicobar Islands
 Port Blair 1 x Cessna 208
 Andaman and Nicobar Islands

Andhra Pradesh State Government
 The Directorate of Aviation 1 x single engine
 TPT. Road & Buildings Department 1 x Alouette helicopter
 Hyderabad

Bihar State Government
 Captain A.K. Sinha 2 x Beech Bonanza
 Patna Airport 2 x piston twin engine
 Patna 2 x Dauphin helicopter
 1 x Beech Kingair C90
 1 glider
 1 x Navion

The Chief Minister, Mr. Laloo Prasad Yadav, has applied to the Central Government to import a US\$ 5 million corporate jet.

Gujarat State Government
The Directorate of Aviation
GAIC, Khet-Udyog Bhavan
Opp. High Court, Navrangpura, Ahmedabad-380 014
Tel: (91-272) 404741
Fax: (91-272) 448082

1 x Dauphin helicopter

Joint Secretary/Aviation Advisor Captain R.N. Dogra
Tel: (91-272) 442863

Haryana State Government
Wing Cdr. A.L. Mehta
SCO.411-12, Sector 35-C
Chandigarh-160 036, Punjab

19 x single engine trainer
5 x glider
1 x Beech Kingair C90

Jammu & Kashmir State Government
The Directorate of Aviation
No. 6 Gupmer Road, Srinagar

1 x Cheetah helicopter

Karnataka State Government
The Directorate of Aviation
Commissioner & Secretary, Bangalore

1 x single engine
1 x Alouette helicopter

Maharashtra State Government
Aviation Department
Hangar No 6, Juhu Airport
Bombay-400 054
Tel: (91-22) 612-3344, 612-3544

2 x Alouette helicopter
1 x Beech Kingair 200
1 x Beech Kingair C90

Additional Chief Pilot

Captain V.V.R. Marwah

Madhya Pradesh State Government
Captain V.P. Singh
Civil Aerodrome, Bhopal-462 035

1 x Alouette helicopter
1 x Dauphin helicopter
1 x Beech Kingair 200

Orissa State Government
The Directorate of Aviation
Bhubaneshwar

2 x single engine
1 x piston twin engine
1 x Beech Kingair 200

Punjab State Government
The Directorate of Aviation
Sector 19A, Chandigarh

22 x single engine trainer
4 x glider
1 x Beech Kingair C90

Rajasthan State Government
The Directorate of Aviation
Jaipur

2 x single engine
1 x piston twin engine
1 x Alouette helicopter
1 x Beech Kingair C90

Uttar Pradesh State Government
Wing Cdr. P.C.F. D'Souza
State Civil Aviation
Lucknow Airport
Lucknow

12 x single engine trainer
3 x piston twin engine
2 x Alouette helicopter
1 x Beech Kingair C90
1 x Beech Kingair 200

West Bengal State Government
Group Captain N.K. Rudra
Transport Department
Writers Building, Calcutta-700 001

2 x single engine
2 x Alouette helicopter

Appendix - M

INDIAN AEROSPACE COMPANIES

AERONAUTICAL DEVELOPMENT AGENCY
Ministry of Defence
P.B. 1718, Vimanpura Post, Bangalore-560 017
Fax: (91-812) 569445

Deputy Project Director, Mr. V. Ranganathan
LCA Programme Director, Dr. Kota Harinarayana

BHARAT ELECTRONICS LIMITED
116/2 Race Course Road, Bangalore-560 001
Tel: (91-812) 262626
Fax: (91-812) 268410
Tlx: 0845-8650 BE IN

Chairman and Managing Director, Mr. P.D. Modak
Commercial Director, Dr. V.K. Koshy

BHARAT HEAVY ENGINEERING LIMITED
Ranipur, Hardwar-249 403
Fax: (91-1334) 6462, 6468

Chairman and Managing Director,
Mr. A. Govisiddappa

GAS TURBINE RESEARCH ESTABLISHMENT
P.O. Box No. 9302, C.V. Raman Nagar
Bangalore 560 093

GUJARAT STATE ELECTRONICS LIMITED
Anurag Commercial Centre
Race Course, Baroda - 390 005
Tel: (91-265) 324514, 324495

Chairman and Managing Director, Mr. S.K. Duggal

NATIONAL AERONAUTICAL LABORATORY (NAL)
Civil Aviation Unit, WTC Belur,
Bangalore-560 037
Karnataka
Tel: (91-812) 579611, 571461
Fax: (91-812) 560942

Director Professor R. Narasimha
Director-Projects Dr. Damania
Deputy Director (Head, Civil Aviation Unit)
Dr. M. Shivakumara Swamy

TANEJA AEROSPACE & AVIATION LTD.
305 Mota Chambers, 9 Cunningham Rd.
Bangalore-560 052
Tel: (91-812) 260751
Fax: (91-812) 268649

Emeritus Scientist Raj Mahindra
Head of LTA Team Dr. K. Yegnanarayana
Chief Executive, Mr. Dinesh Kumar
General Manager, Mr. S.P. Singh
Director, Mr. B.R. Taneja (Chairman, Indian
Seamless Metal Tubes Limited)

24/25 Indra Place
H Block, Connaught Circus, New Delhi-110 001
Tel: (91-11) 371-2171
Fax: (91-11) 352471

Executive Director, Squadron Leader C.L. Khosla

Appendix - N

HINDUSTAN AERONAUTICS LIMITED

Corporate Headquarters

Hindustan Aeronautics Limited
Post Box No. 5150, 15/1 Cubbon Road
Bangalore-560 001
Tel: (91-812) 268003, 263005
Fax: (91-812) 268758
Tlx: 0845-2266

Chairman - Mr. R.N. Sharma

Managing Director MiG Complex - Mr. H.K.L. Anand

Managing Director Accessories Complex - Mr. H.C. Kholay

Managing Director Design & Development - Dr. Ramanujachar

Director Finance - Mr. B.R. Krishnamurthy

Director Corporate Planning - Mr. S.N. Sachindran

New Delhi Liaison Office

101-104, Aurobindo Place,
Hauz Kaus, New Delhi-110 016
Tel: (91-11) 664604, 660528
Fax: (91-11) 6864683
Tlx: 031-65691

Resident Manager - Group Captain M.S. Shukla (Retd)

Bangalore Complex,

P.B. No. 1785, Bangalore-560 017
Tel: (91-812) 565201, 561020
Fax: (91-812) 565188
Tlx: 0845-2234 HAL IN

Managing Director - Dr. C.G. Krishnadas Nair, Tel: 570773, 568230

Aircraft Division

Bangalore Complex,
P.B. No. 1788, Bangalore-560 017
Tel: (91-812) 565201, 561020
Fax: (91-812) 565188, 561956
Tlx: 0845-2234 HALM IN

General Manager - Mr. B. Haridass

Deputy General Manager (Exports) - Mr. Naresh K. Palta

Established in 1947, this division is responsible for the licenced production of the JAGUAR tactical strike aircraft, and the indigenous KIRAN MK II basic jet trainer. After a two-year break, production of the Jaguar has restarted with an order for 15 aircraft. If the IAF is required to maintain its force levels over the next 15 years, it is likely that there will be further orders for the Jaguar. It also manufactures and exports aircraft components. This division will undertake licenced production of an Advanced Jet Trainer, commencing about one year after selection of an aircraft.

Helicopter Division

Bangalore Complex,
P.B. No. 1790, Bangalore-560 017
Tel: (91-812) 565201, 561020
Fax: (91-812) 560096
Tlx: 0845-2764 CPTR IN

General Manager - Mr. V.D. Pradkar

Additional General Manager - L.M. Bharadwaj

Additional General Manager (Design) - K.S. Sudheendra

Chief Test Pilot (RW) - Group Captain B.S. Chokker

Established in 1974, this division builds two types of Alouette helicopters under licence from Aerospatiale. The Alouette III/HAL CHETAK is being produced in large numbers for the IAF, Navy, Army, and civilian customers, as well as for export. The Lama/HAL CHEETAH has been developed as a variant of the Alouette II/III family, specifically to meet the high altitude requirements of the Indian Armed Forces. To date, 500 CHETAK and CHEETAH helicopters, along with their engines, have been produced. On April 30, 1993, HAL handed over its 3000th aircraft (a Cheetah helicopter) to the Chief of Air Staff. The division also undertakes repair and overhaul of helicopters.

Engine Division

P.B. No. 9310, Bangalore-560 093
Tel: (91-812) 565201, 561020
Fax: (91-812) 576792
Tlx: 0845-2722

General Manager - Mr. Behari Lal

Established in 1960, this division manufactures, overhauls and repairs the Adour MK. 811 for the Jaguar, the Orpheus 70105 for the Kiran MK II, the Garrett TPE 331 for the HAL Dornier 228 and the Artouste IIIB for the Cheetah and Chetak helicopters. To meet the powerplant requirements of the ALH, the Engine Division will be undertaking the manufacture and overhaul of the Turbomeca TM 333 B engine.

Overhaul Division

Bangalore Complex

P.B. No. 1786, Bangalore-560 017

Tel: (91-812) 565201, 561020

Fax: (91-812) 565188

Tlx: 0845-2234

Additional General Manager - Mr. A.P. Aneja

The Division repairs and overhauls airframes, engines, certain instruments and accessories primarily for the Jaguar, Canberra, Kiran and AN-32 aircraft.

Foundry and Forge Division

Bangalore Complex,

P.B. No. 1791, Bangalore-560 017

Tel: (91-812) 565201, 561020, 542753

Fax: (91-812) 541397

Tlx: 0845-234 HALM IN

Additional General Manager - Mr. B. Chatterji

It is a centralised Division supplying castings and forgings for various aircraft and engines. Its capabilities extend from precision castings weighing a few grams to sand castings weighing 350 kgs, which meet stringent radiographic standards. Its production ranges from engine blades to aircraft undercarriages.

Aerospace Division

P.B. No. 7902, New Thippa Sandra P.O., Bangalore-560 075

Tel: (91-812) 565201, 561020

Fax: (91-812) 541652

Tlx: 0845-2908

General Manager - Dr. C.R. Ramanujachar

This Division was established in 1988 to support the country's space and missile programmes. It is involved in manufacturing major components for the ISRO (Indian Space Research Organisation), including large structural assemblies for the ASLV- D2 (augmented space launch vehicle) and the PSLV (Polar Satellite Launch Vehicle).

Koraput and Nasik Divisions

Koraput Division

P.O. Sunabeda-763 001, District Koraput

Tel: (91-6853) 20200, 20004

Fax: (91-6853) 20004

Tlx: (0495) 248

General Manager - Mr. V.M. Akolkar

Nasik Division

Ojhar Township P.O.

Nasik-422 207

Tel: (91-253) 77901/10, 78117

Fax: (91-253) 375825

Tlx: (0752) 241

General Manager - Mr. N.R. Mohanty

These are the two Divisions of the MiG Complex. While the Nasik Division is responsible for airframe production, integration, test flying and overhaul, the Koraput Division manufactures a series of power plants, including the R-29B engine for the MiG 27M. The Russian aircraft being built under licence by HAL in the MiG Complex are: MiG 21FL, MiG 21M, MiG 21bis, MiG 23MF and MiG 27M. HAL recently handed over its 100th MiG 27 aircraft to the Chief of the Air Staff. MiG 27M production is likely to be extended to 2000. Avionics, instrumentation and accessories for these MiGs are supplied by the Lucknow and Hyderabad Divisions of the Accessories Complex.

Lucknow Division

P.O. HAL, P.B. No. 215

Lucknow-226 016

Tel: (91-522) 384369
Fax: (91-522) 383973
Tlx: (0535) 228, 428
General Manager - Mr. A.K. Sur

The Accessories Complex, which is headquartered at Lucknow, produces a broad range of avionics, mostly of proprietary design, including hydraulic systems, panel and gyroscopic instruments, main and parking brakes, and navigation systems.

The Lucknow Division produces a range of about 800 aircraft accessories, primarily for the Jaguar, MiG 27M and Dornier 228 aircraft, including wheels and brakes, ejection seats, environmental control equipment, fuel accessories and instrumentation under licence from Martin Baker, Dowty, Dunlop, NGL, Ferranti, Smiths, Seena, SFIM and BADIM, while also producing indigenously-developed electrical and hydraulic accessories.

Hyderabad Division

Hyderabad-500 042

Tel: (91-842) 278978, 261978, 260181

Fax: (91-842) 262589

Tlx: 0425-6226, 0425-6575

General Manager - Wing Cdr. S.K. Roy Choudhary

Additional General Manager (Manufacturing) - Mr. Rajiv Sharma

The Hyderabad Division produces a range of avionics for the MiG 27M, V/UHF communication sets, radio compasses, radio altimeters, the Primus 500 colour weather radar, the Tracor 7800 Omega Navigation System, and Ground Proximity Warning Systems.

Kanpur Division

P.O. Chakeri, Kanpur-208 008

Tel: (91-512) 42488

Fax: (91-512) 350505

Tlx: 0325-243

General Manager - Mr. G.S. Singhal

Deputy General Manager - Mr. M.P. Khanna, Tel: 42340

Additional General Manager - Mr. A.P. Arya, Tel: 42467, 42483

Chief Manager - Mr. S.K. Jha, Tel: 43984, 42340

The Kanpur Division is engaged in the licensed manufacture of the Dornier 228, a multi-purpose light transport aircraft used by the IAF, Navy, Coast Guard and Vayudoot. Production was originally set at 150 aircraft, but it is unlikely that more than 90 aircraft will be sold. It also manufactures the HPT-32 piston-engined trainer, for which the current production run is for 54 aircraft, for a total of 144 aircraft. The division also overhauls the HPT-32 and the HAL-built BAe 748.

Korwa Division

P.O. Korwa-227 412

Tehsil-Amethi, District-Sultanpur

Tel: (91-536) 2782, 2185

Fax: (91-536) 2518

General Manager - Mr. T.K. Dhar

The Advanced Systems Division at Korwa manufactures inertial navigation systems and other advanced avionics systems, including the SAGEM ULISS, the FERRANTI COMED and Laser rangefinders, Smiths' HUD for the IAF JAGUAR-DARIN nav-attack system, the 44 LM nav-attack system and flight data/test recorder for the MiG 27M and MIRAGE 2000 aircraft, and for future combat aircraft types.

Design Complex

MDDND Unit, Bangalore Complex

Bangalore-560 017

Tel: (91-812) 565201, 561020

The Design Complex at Bangalore has the following projects in hand.

- a) Advanced Light Helicopter (ALH) Programme

To meet the growing requirements of the Armed Forces for helicopters in the 1990s and beyond, the Design Complex, in collaboration with MBB of Germany, has pursued the ALH program. The first prototype was produced on June 29, 1992 and the trouble-free inaugural test flight was on August 30, 1992. The second prototype was flown on April 8, 1993. A third prototype, under construction, is to be flown in 1993-94.

Messerschmitt-Bolkow-Blown (MBB) GmbH, now part of the Franco-German firm, Eurocopter, has set up its office in Bangalore to follow up on the ALH project. It has expressed interest in teaming up with HAL for the manufacture of the ALH. Production of the multi-role ALH is scheduled to commence in 1995-96. A detailed report in this respect has already been submitted to the Indian Government which has yet to give an investment sanction. FPT Industries Limited, the fuel tank and inflation systems division of Westland Aerospace Limited, has been selected to supply the inflation system for the ALH, and will provide up to four aircraft inflation system sets.

After production of the military version of the ALH, HAL plans to develop and produce a civil version of this helicopter.

b) BAe 748

A HAL-BAe 748 is being structurally modified for an Airborne Early Warning (AEW) role.

Appendix - O

PRIVATE MAINTENANCE FACILITIES

AEROCOPTER SERVICES LTD.

Hangar No 8, Juhu Airport, Bombay-400 054

Tel: (91-22) 612-3167

Managing Director Mr. A.B. Karnik

Maintenance - helicopters. 10 employees

AIR SURVEYS OF INDIA

27 J.L. Nehru Road, Calcutta

Maintenance - fixed wing

AIR WORKS INDIA ENGINEERING PRIVATE LTD.

Bombay International Airport, Santa Cruz, Bombay-400 029

Tel: (91-22) 612-5036, 612-4448, 612-5131

Fax: (91-22) 611-5232

Managing Director Mr. Ravi Menon

Maintenance - from single engine aircraft to helicopters to corporate jets. The company has recently been type certified for Boeing 737. 100 employees. Also has bases at Delhi, Madras, Hyderabad and Bangalore.

ARCHANA AIRWAYS (see profile under Operating Private Airlines in Appendix I)

I.G.I. Airport, New Delhi

Maintenance - fixed wing

BOMBAY FLYING CLUB

Juhu Airport, Bombay-400 049

Tel: (91-22) 612-8058

Chief Engineer Mr. P.U. Nayak

Maintenance - single and twin engine aircraft, and engine overhauls (flat pistons).

CAMA AVIATION SERVICES

Hangar No 5, Juhu Airport, Bombay-400 049

Tel: (91-22) 612-2839, 614-9878, 611-5303

Fax: (91-22) 611-3652

Managing Director Phiroze K. Cama

Maintenance - single and twin engine aircraft, propellers, overhauls. 10 employees. Also has avionics and parts supplies.

DELHI FLYING CLUB
Safdarjang Airport, New Delhi-110 003
Tel: (91-11) 618931
Chief Engineer Mr. M.L. Datta
Maintenance - single and twin engine fixed wing aircraft.

DELHI GULF AIRWAYS (see profile under Operating Air Taxis in Appendix I)
Safdarjang Airport, New Delhi-110 003
Maintenance - helicopter.
Branch - I.G.I. Airport, New Delhi

INDAMER COMPANY PRIVATE LTD.
Hangar No 1, Juhu Airport, Bombay-400 054
Tel: (91-22) 611-1352, 611-5661, 611-7824
Fax: (91-22) 611-3626
Managing Director Mr. Richard Koszarek
Director Mr. A.K. Murthy
Beechcraft dealer. 40 employees.

Maintenance - from single engine aircraft to helicopters to corporate jets. The company operates Aerial Services Pvt Ltd. Jet charter (see profile under Corporate Aircraft Operators in Appendix K). Currently has one Beech Kingair C90 registered in its name, which is for sale.

PARTS SUPPLIES

ATHERTON ENGINEERING
Calcutta
Mr.R.Jaitha, Bombay Fax: (91-22) 218-5195

Appendix - P

AVIATION MEDIA IN INDIA

INDIAN AVIATION: Civil and Military
602/603 Palm Beach Apartment, J.P. Road, Versova, Bombay-400 061, India
Tel: (91-22) 626-0195
Fax: (91-22) 626-5604
Published weekly - US \$200 per year including air mail

SKYWAYS Aviation Magazine of Asia
The Subscription Department
Aeronautical Publications of India
Santa Cruz Old Airport, Bombay-400 029, India
Tel: (91-22) 612-4448
Fax: (91-22) 612-5131
Published monthly - US \$50 per year including air mail

The STAT Trade Times (N.B. STAT = Shipping, Transport, Aviation, Tourism)
C5/12/3:1, Sector 5, Central Business District, (Post Bag 10), New Bombay-400 614, India
Tel: (91-22) 768-4550, 768-3706
Fax: (91-22) 767-2619
Published monthly - US \$72 per year including air mail

VAYU Aerospace Review
D-43 Sujan Singh Park, New Delhi-110 003, India
Tel: (91-11) 462-6183
Fax: (91-11) 462-3271
Published bi-monthly - US \$35 per year including air mail

Appendix - Q

GOVERNMENT PROCUREMENT AND TENDERING PRACTICES

Air India, Indian Airlines, Vayudoot, and Pawan Hans are all public sector undertakings. Most of the Indian aerospace industry companies listed in Part IV of this report are also public sector undertakings. As such, they follow public sector procurement and tendering practices prescribed by the Bureau of Public Enterprises (BPE), Ministry of Industry.

The Public Sector undertakings prepare their revenue budget and capital budget for the financial year beginning on 1st April and ending on 31st March. The budget requires the approval of the Board of Directors and of the administrative Ministry. Normally all capital works should have been included in the capital budget for the year. In exceptional circumstances new items can be purchased provided they are included in the revised budget for the year.

According to the guidelines issued by the BPE on August 20, 1986, a public sector undertaking has powers to incur expenditure up to Rs. 200 million on capital equipment without the prior approval of the Government. For purchases above Rs. 200 million, the proposal, after the approval of the Board of Directors and the administrative Ministry, has to be cleared by the Public Investment Board and the Cabinet Committee for Economic Affairs.

All capital works and equipment form a part of the project which is shown in the budget. If the equipment is a low-value item, quotations can be obtained from vendors on the approved list. For all major purchases national tenders (if the equipment is manufactured indigenously), or global tenders, are floated. Tenders may be invited in two parts: technical bids and price bids. Technical bids are opened first and vetted by the user Department. The price bid is opened only if the vendor is found professionally competent.

A tender committee containing representatives of the user Ministry, a non-user Ministry and the Finance Ministry opens the tenders in the presence of the vendors or their representatives. After the scrutiny and vetting by the user Ministry, the Finance Ministry submits its comments on the recommendations of the user Ministry and forwards them to the Chairman for approval. Normally the lowest bid submitted by a qualified tenderer is awarded the work. However, if the lowest bidder is not considered technically competent or reliable, the second lowest tenderer is invited to match the price quoted by the lowest tenderer to get the work. The tender committee is required to give justification when the work is awarded to a vendor who has not given the lowest quotation.

Appendix - R

USEFUL CONTACTS IN INDIA AND CANADA

National Airports Authority
Operational Complex
Safdarjung Airport
New Delhi-110 003
Tel: (91-11) 463-2930
Fax: (91-11) 463-2990
Mr. K.N. Ardhanareeswaran, Chairman

International Airports Authority of India
IAAI Operational Building
Gurgaon Road
New Delhi-110 037
Tel: (91-11) 545-2465, 545-2466, 545-2467
Fax: (91-11) 545-2830
Mr. K.N. Ardhanareeswaran, Chairman

Director General of Civil Aviation
Opp. Safdarjung Airport
New Delhi-110 003
Tel: (91-11) 462-2495, 462-0784
Fax: (91-11) 462-9221
Mr. H.S. Khola, Director General

Ministry of Civil Aviation and Tourism
Sardar Patel Bhawan, Sansad Marg
New Delhi-110 001
Tel: (91-11) 344153, 345779, 351700
Fax: (91-11) 344935
Mr. Gulam Nabi Azad, Minister
Mr. S. Kanungo, Secretary

Canadian High Commission
Commercial Section
7/8 Shantipath, Chanakyapuri,
New Delhi-110 021
Tel: (91-11) 687-6500
Fax: (91-11) 687-5387
Tlx: 031-72363 DMCN IN

Consulate of Canada
4th Floor, 41/42 Maker Chambers VI
Jamnalal Bajaj Marg, Nariman Point
Bombay-400 021
Tel: (91-22) 287-6027
Fax: (91-22) 287-5594
Tlx: 011-85122 COC IN

External Affairs and International Trade Canada
Pacific South Trade Development Division (PST)
125 Sussex Drive
Ottawa, Ontario K1A 0G2
Tel: (613) 995-7689
Fax: (613) 996-4309

External Affairs and International Trade Canada
Aerospace and Defence Programs Division (TAG)
125 Sussex Drive
Ottawa
Ontario K1A 0G2
Tel: (613) 996-1814
Fax: (613) 996-9265

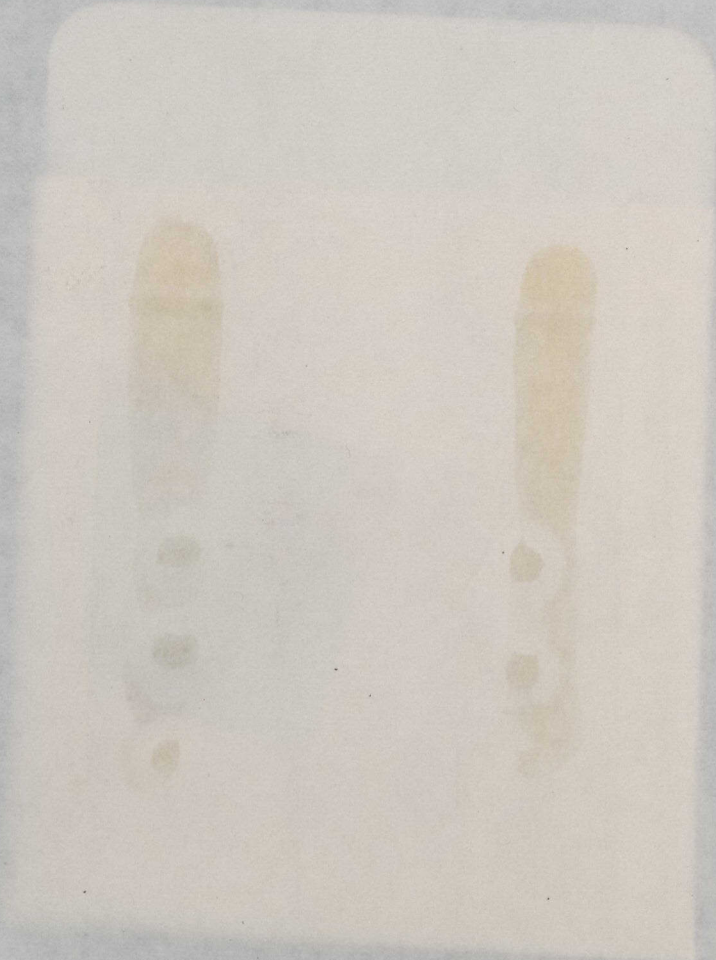
Industry, Science and Technology Canada
C.D. Howe Building
1st Floor, East Tower, 235 Queen Street
Ottawa, Ontario K1A 0H5
Tel: (613) 952-1STC
Fax: (613) 957-7942

Director General Service and Construction
Industries, Peter J. Sagar, Tel: 954-2994

Director General Aeronautics, W.J. Laycock,
Tel: 954-3343

Director General Defence Electronics and Space,
Bob Burns, Tel: 954-3415

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National Airports Authority
Operational Complex
Safdarjung Airport
New Delhi-110 003
Tel: (91-11) 463-2930
Fax: (91-11) 463-2990
Mr. K.N. Ardhakare-swami, Chairman

International Airports Authority of India
IAAI Operational Building
Gurgaon Road
New Delhi-110 037
Tel: (91-11) 245-2465, 245-2466, 245-2467
Fax: (91-11) 245-2830
Mr. K.N. Ardhakare-swami, Chairman

Director General of Civil Aviation
Opp. Safdarjung Airport
New Delhi-110 003
Tel: (91-11) 462-2466, 462-0724
Fax: (91-11) 462-9321
Mr. H.S. Khata, Director General

Ministry of Civil Aviation and Tourism
Sardar Patel Bhawan, Samad Marg
New Delhi-110 001
Tel: (91-11) 242153, 242178, 242191
Fax: (91-11) 242155
Mr. Gopal Nath
Mr. S. Kinnage

Canadian Air Corporation
1000...
New Delhi-110 003
Tel: (91-11) 467-6901
Fax: (91-11) 467-5307
Tel: (91-11) 467-5307

Consulate of Canada
4th Floor, 40/42 Minar Chattras VI
Mumbai Bazar Marg, Nariman Point
Bombay-400 021
Tel: (91-22) 287-6027
Fax: (91-22) 287-2994
Tel: (91-11) 45122 000 TN

External Affairs and International Trade Canada
1000... South Trade Development Division (PST)
175 Super Drive
Ottawa, Ontario K1A 0G2
Tel: (613) 995-7889
Fax: (613) 995-4309

External Affairs and International Trade Canada
Aerospace and Defense Programs Division (1447)
175 Super Drive

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aircraft, aerospace industry.
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