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Market study on aerospace products
and services in Malaysia : final
report
43270692

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CANADIAN HIGH COMMISSION

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FINAL REPORT

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EXECUTIVE SUMMARY

The current demand for aerospace products in Malaysia is estimated to be about US\$500 million. The domestic market is projected to exhibit very modest growth over the period 1988 to 1990 increasing at about 3 percent per annum. All of Malaysia's requirements will however continue to be met through imports except the replacement market for tires. The local manufacturer of aviation tyre is Syarikat Rempis Aviation Sdn. Bhd. The principal foreign countries supplying Malaysia's product requirements include United States of America, United Kingdom, France, Germany and Switzerland.

Canada is not a significant source for aerospace products although industry sources are familiar with some Canadian products such as aircraft sold by DeHavilland (Twin Otters, Caribou) and Bombardier's Challenger, Pratt and Whitney Canada engines and CMC flight simulators. The lack of after sale service and inadequate product support has however in some instances tarnished the Canadian image. In 1986, Malaysia imported US\$17 million worth of aerospace products out of which Canada's contribution was about 0.5 percent.

EXECUTIVE SUMMARY

The reasons for this low level of Canadian representation in the industry stem from:

- a Lack of awareness of Canadian products and their technology
- b Inadequate representation by local agents
- c Insufficient product support and after-sales services
- d Unfamiliarity with the local business environment

It is projected that Canada's percentage share of the market will not improve if marketing and promotional efforts are not intensified. In addition, Canadian exporters need to be more aware of the manner in which business is conducted in Malaysia especially in dealing with government organizations.

The Ministry of Defence (MINDEF) is a major purchaser of aerospace products. However its purchasing capacity is limited by the annual budget it receives from the Federal Government. For the next three years, the Federal Government will not be encouraging purchases or undertaking of projects which may further increase its debt ratio. Therefore countertrade and other product support services which a manufacturer can provide may help to speed up project implementation or influence purchasing decisions.

EXECUTIVE SUMMARY

The current demand for aerospace products in Malaysia is estimated to be about C\$500 million. The domestic market is projected to exhibit very modest growth over the period 1988 to 1990 increasing at about 5 percent per annum. All of Malaysia's requirements will however continue to be met through imports except the replacement market for tires. The local manufacturer of aviation tyre is Syarikat Dunlop Aviation Sdn. Bhd. The principal foreign countries supplying Malaysia's product requirements include United States of America, United Kingdom, France, Germany and Switzerland.

Canada is not a significant source for aerospace products although industry sources are familiar with some Canadian products such as aircraft sold by Dehavilland (Twin Otters, Caribous) and Canadair's Challenger, Pratt and Whitney Canada engines and CAE flight simulators. The lack of after sale service and inconsistent product support has however in some instances tarnished the Canadian image. In 1986, Malaysia imported C\$412 million worth of aerospace products out of which Canada's contribution was about 0.5 percent.

The reasons for this low level of Canadian representation in the industry stem from:

- o Lack of awareness of Canadian products and their technology
- o Inadequate representation by local agents
- o Insufficient product support and after-sales services
- o Unfamiliarity with the local business environment

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Prospects in this industry include replacement of Malaysian Airline System's (MAS) existing fleet to upgrade and expand its long haul services, purchases of fighter aircraft and interceptors by the Royal Malaysian Air Force (RMAF), purchase of helicopters by the Police Air Unit and leasing of aircraft by the Malaysian Helicopter Services. Pelangi Air, the new domestic airline is planning to purchase a Twin Otter, and an executive jet. MAS also intends to replace and upgrade most of its avionics while RMAF intends to spend about C\$10 million to C\$15 million on avionics over the next three years.

Another significant area is the upgrading of maintenance and engineering capabilities and facilities by the major maintenance suppliers in order to compete for overseas contracts. In civil aviation, the Department of Civil Aviation (DCA) which is responsible for airport and air traffic services development has received funds for the expansion and upgrading of the Ipoh and Sibul airports over the next three years. The allocation of public development expenditure for civil aviation for the period 1986 to 1990 amounts to C\$855 million. It is estimated that a total of C\$100 million will be spent on air traffic control equipment such as air-ground communications, omnirange nav aids, radars, airport control tower equipment, training and other consultancy services over the same period.

As an entry strategy, Canada should maintain a strong presence in the local market. In the selection of a Malaysian agent it is recommended that Canadian companies tie up with a Bumiputra (indigenous Malay) company which has a good track record in providing product support and after sales services. Joint venture for manufacturing is only feasible if the manufacturers have a sufficiently large export market to augment the relatively small domestic market Malaysia offers. Other critical success factors in this industry include:

- o Short service turn-around time
- o Close working relationship
- o Good after sales service
- o Attractive financing facilities
- o Provision for counter-trade arrangement and training packages

While the Canadian presence in the local aerospace market has been modest, this study outlines a number of product and service requirements over the next three years which could be sourced from Canada.

I. INTRODUCTION

1.0 OBJECTIVE OF STUDY

The principal objective of this study is to determine and evaluate the existing market, potential areas of growth, market conditions and factors which will encourage the sale of Canadian aerospace products in the local market.

2.0 SCOPE OF STUDY

This study covered the following major market characteristics:

- o Structure of the aerospace industry in Malaysia to provide Canadian suppliers with a better understanding of the market
- o Analysis of the end-user sectors including their organization structure and purchasing patterns
- o Identification of key players in the industry
- o Determination of past and current trends of local production, imports, exports and re-exports based on the trade import and export statistics and changes that indicate
- o Identification and appraisal of factors affecting the demand for aerospace products
- o Projection of demand for aerospace products and services for the next three years

I. INTRODUCTION

The study classified aerospace products and services under five main categories:

a. Aircraft

This includes aircraft and helicopters for all purposes.

b. Aerospace Parts and Engines

This grouping includes aircraft parts such as airframe, airframe, wings, fuselage, etc. Engines and engine parts include fuel control, fuel pump, propeller, etc. Airframe parts include wings, fuselage, etc. Engines and engine parts include fuel control, fuel pump, propeller, etc. Airframe parts include wings, fuselage, etc. Engines and engine parts include fuel control, fuel pump, propeller, etc.

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- o Determination of past and current trends of local production, imports, exports and re-exports based on the trade import and export/reexport statistics and through field interviews
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The study classifies aerospace products and services under five main categories:

a. Aircraft

This includes aircraft and helicopters for all purposes.

b. Aircraft Parts and Engines

This grouping includes aircraft parts such as ailerons, airscrews, axles, brakes, landing gear assemblies, rotors, floats, propellers, auxillary power units, wings, fuselage, etc. Engines and engine parts include fuel control, fuel pumps, ignition plugs, clips, valves, etc.

c. Avionics

This category covers products such as electronic flight instrument systems, health and usage monitor systems, flight management systems, flight data recorders, etc., as well as flight simulators.

d. Air Traffic Control

Equipment in this category includes surveillance radars, instrument landing systems, omnirange VOR/distance measuring equipment, area control consoles and control tower consoles.

e. Maintenance, repair and overhaul services.

3.0 METHODOLOGY

The study relied on field interviews with major aerospace companies, other minor distributors as well as relevant government agencies for procedures, policies and decision making processes governing the aerospace industry. Published trade statistics on the import, export and re-export of specific categories of aerospace products were obtained from the Department of Statistics.

Many of the aerospace products under study however are incorporated under broad product categories in trade statistical publications. In such cases, independent estimates of the market size and potential growth were obtained through discussions and interviews with major industry sources.

4.0 LIMITATIONS

A limitation of the study stems from the lack of official statistics available on the market sizes of various market segments. Thus, the figures quoted are based on industry estimates and should be taken only as approximate indications of the respective market sizes.

Except for the trade statistics where the exchange rates used are the annual averages as released by the Central Bank, all dollar figures quoted in this study are based on the exchange rate of M\$2 for every C\$1.

II. OVERVIEW

1.0

GENERAL

The Malaysian aerospace industry is relatively young and like other developing countries in this region, the Malaysian government plays a leading role in the development of this industry. The industry is closely knit with the Malaysian government having major shareholdings in the principal aircraft operators and in Aerospace Industries of Malaysia (the holding company of Alrod Sdn. Bhd. which, at present, is the cornerstone of the national aerospace industry). Furthermore air-SMAF and/or Army officers often participate in the management or as shareholders of local companies holding agencies of principal foreign aerospace companies.

2.0

DOMESTIC PRODUCTION AND GENERAL DEMAND

Local production of aerospace products is limited to aviation tires and flight data recorders. Syarikat Dunlop Aviation Sdn. Bhd., the manufacturer of aviation tires, serves only the local replacement market. All tires manufactured are re-exported to Dunlop. For flight data recorders, Alrod Sdn. Bhd. is the sub-contractor for Lockheed International.

II. OVERVIEW

Malaysia's requirements for aerospace products are met through imports. In 1986, total imports of aerospace products including maintenance, repair and overhaul services were in the region of US\$400 million. However, due to the broad classifications in the import statistics, this import figure may not be relevant. Industry sources have indicated that the annual expenditure on aircraft parts and components, avionics, air traffic control equipment and maintenance services is in the region of US\$300 million; this excludes capital expenditure on aircraft. Based on the above estimates, the market for aerospace products and services, including imports of aircraft for the year 1986 which amounts to about US\$150 million, is in the region of US\$500 million per annum.

The current levels of domestic demand are unable to justify the setting up of production facilities to manufacture such high level technology products, unless the facilities are employed to meet world or at the least Asia-Pacific regional demand. To encourage the setting up of export oriented manufacturing establishments, the Malaysian Government has introduced several investment incentives. Added advantages include the availability of industrial space and the comparatively lower land cost in Malaysia to other developed and developing countries.

II. OVERVIEW

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3.0 MAJOR PLAYERS

The two major purchasers of aerospace products and services in Malaysia are the Ministry of Defence (MINDEF) and Malaysia's National Airline (MAS). MINDEF prefers to deal with local representatives or associates of foreign manufacturers while MAS prefers to purchase directly from the OEMs. The Department of Civil Aviation (DCA) purchases all civil Air Traffic Control (ATC) equipment through a tender process giving preference to local bumiputra companies. Other major aircraft operators include the Royal Malaysian Police Air Unit and Malaysian Helicopter Services Bhd.

The suppliers in the industry are mainly local Bumiputra (indigenous) companies supplying primarily to the Ministry of Defence (MINDEF). These companies are agents of OEMs such as Lockheed, Rockwell-Collins, Pilatus, Aerospatiale, General Electrics, Beech, Aermacchi, Grumman, etc. A characteristic of these local agents is that they represent a wide range of defence equipment and are managed by ex-army personnel with influential contacts.

Some manufacturers such as Thomson CSF, Rockwell-Collins and Hawker-Pacific maintain their presence through their resident representatives. However, these companies when tendering for government purchases will also go through a local company. For instance, Matad Sdn. Bhd. is the local dealer for Rockwell-Collins' products and Hawker-Pacific has two local companies for trading purposes-IRM (Malaysia) Sdn. Bhd. and Gua Musang Sdn. Bhd.. Even the local tire manufacturer Syarikat Dunlop Aviation Sdn. Bhd. tenders through a local bumiputra company, Azi Trading Sdn. Bhd. This arrangement is advisable because these local companies have 80 percent and above Bumiputra shareholding, have close contacts with MINDEF and are normally given preferential treatment. However, MINDEF has also been known to scout the international market for new equipment and then to purchase directly from these sources. Other major OEMs set up subsidiaries and affiliates in Singapore to service regional customers. These companies include Bell Helicopter Asia Pte. Ltd., Ranlod Aviation Services, Garrett Singapore (Pte) Ltd. and Samaero Company Pte. Ltd.

Local companies such as Airod Sdn. Bhd. (of which MINDEF is the principal shareholder) and Malaysia Airline System (MAS) are involved in providing engine repair, maintenance and overhaul services to aircraft operators. Airod services mainly RMAF aircraft while MAS services part of its own fleet and aircraft of other airline operators such as Merpati Nusantara Airlines of Indonesia, Thai Airways International, Royal Brunei Airlines and World Airways.

4.0 PROMOTIONAL EFFORTS

This is an industry where price is not the prime consideration influencing the purchasing decision. Instead factors such as reputation of the product, manufacturer/distributor, ability to meet required specifications, and the services which the supplier can provide in the total package take precedence. Ability to readily access key decision makers is also critical.

Local companies play an important role in the government market segment. Promoting products directly to end-users with arrangements for the end-users to use their products for a trial period is an effective marketing avenue. If successful, the local companies can then proceed to lobby for a closed tender using their product's specifications.

Trade exhibitions also provide an important means for OEMs and their local counterparts to introduce their organisation, expertise and products to the industry for productive exchange. Printed catalogs and brochures are also used as promotional tools during these exhibitions. Companies are often noted just as much for their absence from such trade shows as their presence.

III. AIRCRAFT

1.0 MARKET SIZE

The Malaysian aircraft market is dominated by imports especially wide-bodied jets from the United States. Industry sources indicated that U.S.A. manufacturers account for about 80 to 90 percent of the world's value of all commercial aircraft and engines produced or sold. Other aircraft exporter countries include United Kingdom, Switzerland, Germany and France exporting mainly small to medium aircrafts.

As there are no domestic manufacturers, the import statistics provide the official estimates of apparent demand for aircraft including helicopters for the past four years but excluding re-exports (aircraft being serviced or repaired) to neighbouring countries such as Philippines, Singapore, Indonesia, Thailand and some Western countries like United Kingdom, Luxembourg, Netherlands and U.S.A.

Total imports of all aircraft in 1986 valued C\$160 million of which imports of aircraft of unladen weight exceeding 15,000 kg. amounted to a value of C\$145 million. The huge imports may be due to the Malaysian Airline System (MAS), the national carrier, taking delivery of its B747-300 Super Deck Comet Aircraft from the Boeing Commercial Airplane Division that year. In 1984, imports amounted to C\$8 million increasing to C\$26 million in 1985. For 1987, imports totalled C\$15 million.

III. AIRCRAFT

Canada's imports were C\$1.3 million in 1986 for all types of aircraft. For 1984, 1985 and 1987, there were no imports of aircraft from Canada. However, the two aircraft fleet of the country's newest domestic airline, Palangi Air, which started servicing the country's holiday and island resorts from January 1, 1988 are both Twin Otters from Canada.

The net imports/(exports) of aircraft (including helicopters) for the years 1984 to 1987 can be summarized as follows:

IMPORTS/EXPORTS OF AIRCRAFT 1984 TO 1987 (in C\$'000)

	1984	1985	1986	1987*
Total Imports	7,979	25,594	190,057	14,860
Total Exports/Reexports	8,924	3,614	1,219	88
Net Imports/(Exports)	(945)	21,980	188,838	14,772

Note : * Annualised figures based on trade statistics from January to August 1987

Sources: Malaysian Trade Statistics, 1984 to 1987

III. AIRCRAFT

2.0 LOCAL AIRCRAFT POPULATION

1.0 MARKET SIZE

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Note : + Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

2.0 LOCAL AIRCRAFT POPULATION

Two organisations in Malaysia own the majority of the aircraft. They are the Royal Malaysian Air Force (RMAF) in the military sector and the national carrier, Malaysian Airline System in the civilian sector. Other small operators catering to domestic requirements in air transport, commercial and other uses include the Malaysian Helicopter Services Berhad, Hornbill Skyways, Flight Calibration Unit of the Department of Civil Aviation and Pan Malaysia Air Transport.

2.1 Royal Malaysian Air Force (RMAF)

With a total strength of about 13,000 personnel including technical workforce of about 5,000 personnel and assets of over 250 aircraft, the RMAF is a relatively young air force.

The RMAF inventory of aircraft is detailed in Table 1.

2.2 Malaysian Airline System Berhad (MAS)

Malaysia's National Airline (MAS), was established in 1971 as a 100 percent government owned operation. In 1985, the Malaysian government proceeded to privatize MAS and today retains only 42 percent equity shareholding. The breakdown of MAS's largest shareholders as of July 24, 1987 are as follows: The Government of Malaysia, through the Ministry of Finance (42 percent), Brunei Investment Agency (10 percent), Pemegang Amanah Raya Malaysia Sekim Amanah Saham Nasional (5.32 percent), and the East Malaysia States of Sarawak (5 percent) and Sabah (5 percent).

As of March 31, 1987 MAS had a total staff strength of 11,136 and its fleet comprised 36 aircraft. Its shareholder funds amounted to about C\$390 million for the same period. MAS operates on both domestic and international routes with an average load factor of 72.9 percent. The MAS inventory of aircraft as at March 31, 1987 is provided in Table 2.

TABLE 1
RMAF: INVENTORY OF AIRCRAFT
AS AT JUNE, 1985

<u>Role</u>	<u>Aircraft</u>	<u>Quantity</u>
Transport Helicopter	Sikorsky Nuri S61A-4	36
	Alouette III	24
Training	Pilatus PC 7	44
	Bell 47	7
	Alouette III	7
	Sikorsky Nuri S61A-4	4
Air Defence	Northrop F 5E	14
	Northrop F 5F	4
	Northrop RF 5E	2
Ground Attack	Skyhawk A4 PTM	34
	Skyhawk TA4 PTM	6
Counter-insurgency/Training	Aermacchi MB 339	12
Maritime Recce	Pilatus PC-130H	3
Transport	Lockheed C-130H	6
	Caribou DHC-4A	14
	British Aerospace HS 125	2
	Fokker F 28	2
	Challenger 600	2
	Cessna 402B	12
Reserves	Canadair CL-41G	10
	British Aerospace Bulldog	11
Total		256

Source: Asian Defence Journal 6/85

TABLE 2
MAS: INVENTORY OF AIRCRAFT
AS AT MARCH 31, 1987

<u>Aircraft</u>	<u>Quantity</u>
Airbus A 300B	4
Boeing B747-200/3H6	3
Douglas DC10	3
Boeing B737	11
Fokker F27	11
DHC-6 (Twin Otter)	4
Total	36
	====

Source: MAS Annual Report 1986/1987

Since March 31, 1987, MAS has purchased one B737-200, placed firm orders for one of B747-400 and eight Fokker 50 to replace its fleet of eleven F27. The B747-400 Combi aircraft is due for delivery in March 1989 at a cost of US\$134 million including spares and engines. MAS has an option to buy a similar aircraft in September 1990. The eight Fokker 50 will be delivered in August 1989 to March 1990.

2.3 Malaysian Helicopter Services Berhad (MHS)

Malaysian Helicopter Services Berhad (MHS), a majority government owned company, was launched in early 1983. MHS' shareholders include Trengganu State Government (30 percent), Sabah State Government (15 percent), Sarawak State Government (15 percent) and MAS (40 percent). It currently employs about 300 staff and has an average annual turnover of around C\$54 million.

Helicopters are widely used by the military forces and for commercial transportation. 60 percent of helicopter services in Malaysia are employed in the offshore oil industry and 40 percent in other market segments. MHS owns one of the largest fleets of helicopters with a total of sixteen aircraft as detailed in Table 3.

TABLE 3
MHS: INVENTORY OF AIRCRAFT
AS AT DECEMBER 1, 1987

<u>Aircraft</u>	<u>Quantity</u>
Sikorsky S-61N	6
Sikorsky S-76A	2
DeHavilland Canada DHC-6-300	2
Aerospatiale SA330J Puma	5
British Aerospace HS125-700B	1
Total	16

Source: Department of Civil Aviation

2.4 Other Aircraft Operators

There are over 70 aircraft registered with the Department of Civil Aviation (DCA) as at December 1, 1987 excluding the MAS and MHS fleets. The Flight Calibration Unit of DCA owns a total fleet of 4 aircraft. The detailed inventory of the other major aircraft operators as at December 1, 1987 is as shown in table 4.

TABLE 4
OTHER AIRCRAFT OPERATORS: INVENTORY OF AIRCRAFT
AS AT DECEMBER 1, 1987

<u>Company</u>	<u>Aircraft</u>	<u>Quantity</u>
Hornbill Skyways	Bell 206B	8
	Short Brothers SC-7-3-100	1
	Hawker Siddeley HS 125-403B	1
	Cessna 550 CIT II	1
	Aerospatiale SA 365-C2	1
	Total	12
Sabah Air	Bell 212	1
	Bell 206B	7
	GAF N22B Nomad	1
	Beech King Air 200	1
	Total	10
Flight Calibration Unit, Department of Civil Aviation	Beech King Air 200	2
	Britten Norman BN2 Islander	1
	Cessna 206	1
	Total	4
Boskym Udara	Cessna U 206F	1
	Piper PA-32-300	1
	Britten Norman BN-2A-26	1
	Britten Norman BN-2T	1
	Bell 206B	1
	Total	5
Pan Malaysia Air Transport	Short Brothers SC-7-3-100	2
	Short Brothers SD3-60	1
	Bell 206B	1
	Total	4
Police Air Unit	Cessna U206G	4
	Pilatus PC6	7
	Total	11
Malaysian Flying Academy	Piper PA34-2207	1
	Piper PA28-180	1
	Piper PA38-112	2
	Total	4

Source: Department of Civil Aviation

3.0 INDUSTRY STRUCTURE

3.1 Suppliers

An analysis of the aerospace industry in Malaysia reveals the market to be relatively young and small. Although Malaysia is dependent on foreign aerospace suppliers and manufacturers even for high consumption items, major aircraft original manufacturers do not consider it feasible to set up a representative office or a subsidiary in Malaysia. Instead regional offices are set up to serve the Asia-Pacific region and most of these offices are located in Singapore. In Malaysia, those local companies that are appointed as agents, primarily serve the military market segment.

The major local companies who are agents for the original military aircraft manufacturers are as follows:

<u>Name of Local Company</u>	<u>Aircraft Manufacturer</u>
Maju Ria Sdn. Bhd.	Pilatus Britten-Norman
Aviation Services (M) Sdn. Bhd.	Aerospatiale
Bakti Udara Sdn. Bhd.	Pilatus
Unirep Enterprise Sdn. Bhd.	Lockheed
Gua Musang Sdn. Bhd.	Beech GAF
Matad Sdn. Bhd.	Grumman Bell Helicopters Aermacchi Fokker McDonnell Douglas
IRM (M) Sdn. Bhd.	Sikorsky
Pagar Ruyong Sdn. Bhd.	Canadair
Sime Darby Bhd.	Dehavilland Canada

Bell Helicopter Asia Pte. Ltd., has a regional office set up in Singapore to serve the Asia Pacific region and Ranlod Aviation Services, a Singapore-based company, has taken over regional sales representation of Cessna Aircraft in Southeast Asia.

4.0 MARKET PROSPECTS

4.1 Overview

In the civilian and commercial aircraft market, MAS, the major aircraft operator, recorded a growth of 8.1 percent in its total traffic revenue from both scheduled and unscheduled services for the year 1986. Its passenger revenue increased by 5.9 percent to C\$570 million in 1986 while its cargo revenue increased by 31.3 percent to C\$93 million during the same year. Overall, the utilisation rate of its aircraft increased with the total time flown in 1986 amounting to 99,824 hours compared to 94,886 hours the previous year. MAS also launched new and additional services both domestic and international during the year 1986. It is envisaged that in the long term, MAS will concentrate on the international routes leaving the domestic routes to a new national airline, Pelangi Air.

The expenditure on military aircraft and equipment for the period 1986 to 1990 is governed by the Malaysian Government's allocation for defence and internal security spending under the Fifth Malaysia Plan. The Government is to spend C\$16.3 billion for the 5-year period, 1986 to 1990, on development projects (which covers new aircraft and equipment purchases), down 8 percent from the Fourth Malaysia Plan (1981 to 1985). Of the total allocation for this 5-year period, a budget of C\$118 million is provided for development projects in 1988. Although in the past, the Army normally received about 60 percent of the defence budget the current allocation is not likely to exceed 40 percent with the Navy and Airforce increased to 30 percent each. This may permit the Airforce to modestly increase expenditure on aerospace products.

4.2 Malaysian Airline System Berhad (MAS)

Within the next two to three years, MAS plans to replace the following aircraft from its fleet:

- 3 McDonnell Douglas DC10-30
- 4 Airbus Industrie A300
- 11 Boeing 737-200
- 11 Fokker F27

MAS has already awarded Fokker the contract to replace its existing fleet of 11 F27 with 8 F50 aircraft. Delivery is expected to start in August 1989. For the longer DC10 routes, the aircraft under consideration are MD11 and Boeing 747-400 with options for another 6 in order to expand its long-haul services.

It is estimated that MAS will spend about C\$250 million in addition to the income from sale of the existing aircraft to upgrade and expand its fleet over the next three years.

4.3 Other Aircraft Operators

Malaysian Helicopter Services Berhad (MHS) envisages its operations in the offshore business to continue to expand at an average rate of 10 percent per annum for the next three years. On the average, MHS will need to acquire 1 aircraft per annum over the next 5 years. MHS intends however to lease future aircraft instead of making outright purchases.

The Police Air Unit currently owns 4 Cessnas and 7 Pilatus. The Unit intends to purchase 4 to 6 helicopters over the next three to five years for the purpose of traffic control.

Malaysia's new domestic carrier, Pelangi Air, which owns 2 Twin Otters intends to add a third Twin Otter to its fleet. Pelangi Air is also looking towards acquiring a used corporate jet to start charter flights within South-East Asia by March 1988. Under consideration is a BAe 125-700 and a Cessna Citation II, both seating 7 to 10 passengers. The intention is to take the aircraft initially on a lease-purchase basis, primarily to serve oil industry executives.

4.4 Royal Malaysian Air Force (RMAF)

Based on the RMAF's past years' expenditure and their requirements, it was indicated that RMAF spend about C\$0.5 to C\$1 billion on aircraft and parts every three to four years.

Due to the cut in defence development budget for the period 1986 to 1990, immediate purchases are unlikely. However, RMAF plans to augment its force structure in three key areas commencing with the Fifth Malaysia Plan (1985 to 1990) and encompassing the Sixth and perhaps Seventh Malaysia Plans. The three areas identified are:

- o Air Power
- o Air Support
- o Command, Control, Communication and Intelligence

With such a planned programme, it is envisaged that priority purchases of RMAF include multi-role aircraft, interceptors and ground support aircraft. Unconfirmed sources have projected that in the medium term, new purchases of RMAF will include 8 fighter aircraft and 4 trainers. Currently, RMAF has no interceptors and it is estimated that RMAF will purchase 20 interceptors and the likely candidates are the F16 Fighting Falcon, Mirage, Tornado and AJ37 Viggen. For ground support aircraft the likely candidate is the A4 Skyhawk.

Although RMAF realises that its equipment inventory in the airpower department is being reduced to near-obsolescence through declining age and by the significant advances in the "war-in-the-air" technology, the reduced level of defence budget might hinder its buildup programme in the immediate and medium term. It is therefore expected that the immediate areas of expenditure will be on upgrading of aircraft for combat.

IV. AIRCRAFT PARTS AND ENGINES

IV. AIRCRAFT PARTS AND ENGINES

1.0 MARKET SIZE

Aircraft parts classified under SITC 792.900.00, 714.811.00, 792.830.00, 714.881.00 and 825.300.00, cover airlerons, airscrews, axles, tires, brakes, bomb racks, control columns, doors, elevators, fin assemblies, floats, fuselage sections, fuselage, hulls, landing gear assemblies, panels, propellers, rotors, tail assemblies, wheels, windows, wings, etc. Imports of parts of aircraft and associated equipment not including engines and engine parts had been steadily increasing in recent years from C\$47 million in 1984 to C\$85 million in 1986. In 1987 however, total imports declined to C\$67 million. Details are provided in table 5.

More than half of these products are imported from the U.S.A. and this percentage increased substantially from 53 percent in 1984 to more than 60 percent in 1986 and 1987. Imports from countries such as France, Netherlands, and United Kingdom only accounted for about 25 percent in 1986, a decline from 34 percent in 1984.

IV. AIRCRAFT PARTS AND ENGINES

Exports of aircraft parts of aircraft which were sent out for maintenance, repairs and overhaul. The total value of parts sent out of the country has reduced substantially from C\$150 million in 1984 to C\$70 million in 1986. In 1987, the total value was recorded at C\$56 million. The major countries responsible for maintenance and overhaul work are Germany, U.S.A., United Kingdom, Australia, France and Singapore. Aired Adn. Bhd will be manufacturing some aircraft components in a joint venture with British Aerospace for re-exporting to the joint venture partner. The components to be manufactured will cover the entire range of British Aerospace's civil aircraft dealing mainly with aircraft frames such as a tail cone and wing tips.

There is no local production of aircraft parts and components except for manufacture of aviation tires by Sparikat Dunlop Aviation Sdn. Bhd. However the production capacity of Sparikat Dunlop Aviation Sdn. Bhd. cannot be determined, hence the total imports figure is taken as the estimate of the local market size for these items.

Canada's share of Malaysia's import market for aircraft parts is less than 0.5 percent of the total imports for the period 1984 to (August) 1987. Total re-exports to Canada is also very small; less than 0.5 percent in the same period.

IV. AIRCRAFT PARTS AND ENGINES

TABLE 5
TRENDS OF AIRCRAFT PARTS
1984 TO 1987
(In C\$ 000)

1.0 MARKET SIZE

Aircraft parts classified under SITC 792.900.00, 714.811.00, 792.830.00, 714.881.00 and 625.300.00, cover ailerons, airscrews, axles, tires, brakes, bomb racks, control columns, doors, elevators, fin assemblies, floats, fram sections, fuselage, hulls, landing gear assemblies, panels, propellers, rotors, tail assemblies, wheels, windows, wings, etc. Imports of parts of aircraft and associated equipment not including engines and engine parts had been steadily increasing in recent years from C\$47 million in 1984 to C\$85 million in 1986. In 1987 however, total imports declined to C\$67 million. Details are provided in table 5.

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Exports and reexports relate mainly to parts of aircraft which were sent out for maintenance, repairs and overhaul. The total value of parts sent out of the country has reduced substantially from C\$150 million in 1984 to C\$70 million in 1986. In 1987, the total value was recorded at C\$56 million. The major countries responsible for maintenance and overhaul work are Germany, U.S.A., United Kingdom, Australia, France and Singapore. Airod Adn. Bhd will be manufacturing some aircraft components in a joint venture with British Aerospace for re-exporting to the joint venture partner. The components to be manufactured will cover the entire range of British Aerospace's civil aircraft dealing mainly with aircraft frames such as a tail cones and wing tips.

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Canada's share of Malaysia's import market for aircraft parts is less than 0.5 percent of the total imports for the period 1984 to (August) 1987. Total reexports to Canada is also very small; less than 0.5 percent in the same period.

TABLE 5
IMPORTS OF AIRCRAFT PARTS
1984 TO 1987
(In C\$'000)

<u>SITC</u>	<u>Description</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987+</u>
792.900.00	Parts of aircraft and associated equipment	36,786	51,629	75,165	60,261
792.830.00	Catapults and simulator launching gear, ground flying trainers, parts thereof	214	81	17	20
714.811.00	Turbo propellers for aircraft	2,310	4,097	4,529	6,563
714.881.00	Other gas turbines for aircraft	7,546	2,021	4,710	5
625.300.00	Aircraft tyres, pneumatic new	398	365	311	213
	Total	47,254 =====	58,193 =====	84,732 =====	67,062 =====

Note : + Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

2.0 INDUSTRY STRUCTURE

2.1 Suppliers

Parts and components of aircraft are manufactured by the original equipment manufacturer (OEM) or sold through OEM-appointed suppliers as part of the specifications of aircraft. For instance, a Boeing aircraft assembled in Seattle contains components made in as many as 17 countries with Japan as the leader in the Asian aerospace industry in meeting supplies for U.S.A. aircraft. The nature of the aerospace industry in Malaysia does not make it economically feasible for local production of parts and components.

Syarikat Dunlop Aviation Sdn. Bhd. is the major manufacturer of aircraft tires in Malaysia and their products are widely used in all commercial and military aircraft. Except for the local replacement market for tires, Syarikat Dunlop Aviation Sdn. Bhd. exports all tires manufactured to Dunlop Aviation SEA based in Singapore.

Malaysia is also one of the largest supplier of electronic components such as semiconductors, integrated circuits, modules and sub-systems which are exported back to the foreign principal companies and which may be subsequently used in the aerospace industry. Companies which manufacture such electronic components and parts include Motorola (M) Sdn. Bhd., National Semiconductors, Texas Instrument Sdn. Bhd. and Marconi Malaysia Sdn. Bhd. It cannot be confirmed to what extent such components and parts are used in the aerospace industry.

Local suppliers act mainly as agent of OEMs supplying primarily to MINDEF. MAS prefers to deal direct with the principal foreign companies and in such cases, the local agent's role is primarily a coordinator and collecting agent. The major suppliers are:

- o Aviation Services (M) Sdn. Bhd.
- o Bakti Udara Sdn. Bhd.
- o Unirep Enterprise Sdn. Bhd.
- o Seri Mechan Products Sdn. Bhd.
- o Matad Sdn. Bhd.
- o Azi Trading Co.
- o M & Z Holding Sdn. Bhd.
- o Jauhari Enterprise Sdn. Bhd.
- o Also Azbi (M) Sdn. Bhd.
- o Perusahaan GEC Sdn. Bhd.

OEM subsidiaries and affiliates who have set up offices in Singapore to service the regional customers of their products include the following:

- o Samaero Company Pte. Ltd.
- o Dowty Aviation Services Pte. Ltd.
- o Garrett Singapore (Pte) Ltd.
- o Bell Helicopter Asia Pte. Ltd.

Major parts of aircraft which are considered as specification of the aircraft include aircraft propeller and airborne auxillary power for which manufacturers can be identified. For propellers, Dowty is the sole supplier for Fokker aircraft, Hartzell handles the supply for Dehavilland Canada, Short Brothers, Nomad, Beech, Britten-Norman and Pilatus aircraft, McCauley for Cessna and Piper PA34, and Sensenich for Piper PA28 and PA38 aircraft. Airborne auxillary power is dominated by Garrett especially for B737, DC10, Airbus, British Aerospace and Hawker Siddley aircraft.

2.2 End-User Segments

2.2.1 Malaysian Airline System Berhad (MAS)

MAS dominates the civilian market segment with stock of more than 145,000 items of aircraft spares and components. Nett value of its stock excluding spare engines totals approximately US\$75 million. Engines and parts total about C\$3 million at any one point in time. MAS prefers to deal direct with the OEM or OEM-appointed suppliers instead of purchasing through a local company.

Stocks for parts and components for new purchases of aircraft are worked out jointly between the OEM and MAS. Any subsequent purchases will be determined by the end-user department, which is the Engineering Department. If an order is larger than C\$0.5 million, the approval of the Board of Directors is required.

MAS has computerised its material management and production control which will enable on-line inventory control of about 135,000 parts for all aircraft types except the Twin Otter. With the computerisation, industry sources are optimistic that MAS will purchase more parts and components to improve the performance of their fleet.

2.2.2 Royal Malaysian Air Force (RMAF)

MINDEF is the central purchasing unit for all defence equipment except for purchases below C\$5,000 which the RMAF has the authority to purchase directly (Refer to purchasing procedures in Chapter VIII). MINDEF and RMAF prefer to deal with local companies. MINDEF however does occasionally purchase direct from the OEM and these purchases are mainly major single item purchases classified as foreign military sales. In this region, the US Air Force has established Malaysia as a category B country. It takes about three months for goods to be delivered.

In the past, total purchases of parts for RMAF have averaged about C\$50 million to C\$100 million every three to four years or C\$25 million per annum. The actual yearly expenditure however depends on the budget allocated to RMAF. Due to the reduced defence budget however, local companies have seen the need to actively lobby RMAF to promote product support services and parts for their aircraft.

2.2.3 Malaysian Helicopter Services Berhad (MHS)

MHS spends on an average C\$25 million per annum for maintenance and spares. Due to the small order per purchase, MHS does not buy directly from the supplier. Instead, the bulk of MHS purchases are conducted through their associates in Europe and U.S.A.

2.2.4 Airod Sdn. Bhd.

RMAF has contracted Airod to provide depot level maintenance and overhaul services. With its small buying capacity, during the past three years Airod's operating expenses have been controlled by RMAF. Thus most of Airod's requirements for parts are purchased through RMAF.

3.0 ENGINES

Malaysia's imports of aircraft engines and engine parts are dominated by the U.S.A.; accounting for more than 65 percent of the total imports from 1984 to 1986 (See Table 6).

TABLE 6
IMPORTS OF ENGINES AND ENGINE PARTS
1984 TO 1987
(In C\$'000)

<u>SITC</u>	<u>Description</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987+</u>
713.110.00	Aircraft engines, piston	58,282	34,009	64,758	92,590
714.410.00	Aircraft engines, reaction	1,727	2,230	7,660	236
713.190.00	Parts of engines, piston	43,770	34,998	21,980	28,290
714.911.00	Parts of reaction engines or of turbo propellers	<u>242</u>	<u>693</u>	<u>204</u>	<u>4</u>
	Total	<u>104,022</u>	<u>71,930</u>	<u>94,603</u>	<u>121,120</u>

Note : + Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

Malaysia re-exports engines and parts for maintenance, repairs and overhaul mainly to Australia, Singapore, Hong Kong, Belgium, Germany, United Kingdom and U.S.A.

The major brands of engines in Malaysia are Pratt and Whitney Canada, Rolls Royce and General Electric. In the civilian market segment, there are about 15 Pratt and Whitney engines in service, 14 Rolls Royce and 7 General Electric while in the military market segment there are 70 General Electric engines, 44 Pratt and Whitney Canada and 16 Rolls Royce in service. The breakdown of the types of engines for each major end-user is presented in Table 7.

TABLE 7
NUMBER AND TYPES OF ENGINES OF MAJOR END-USERS

<u>End-User</u>	<u>Aircraft</u>	<u>Engine Type</u>
1. MAS	B747-300 Combi	P&W
	B747-200	RR
	DC10-30	GE
	A300 B4-203	GE
	B737-200/200QC	P&W
	F27-500/500RF	RR
	DHC-6	PWC
2. RMAF	Sikorsky Nuri S6 1A-4	GE
	Alouette III	Artouste
	Pilatus PC7	PWC
	Bell 47	VO-435 International Aero Engines
	Northrop F5E	GE
	Northrop F5F	GE
	Northrop RF5E	GE
	Skyhawk A4 PTM	Not Available
	Skyhawk TA4 PTM	Not Available
	Aermacchi MB 339	RR
	Pilatus PC-130H	Allison
	Lockheed C-130H	Allison
	Carobon DHC-4A	RR
	British Aerospace HS 125	RR
	Fokker F28	RR
	Challenger 600	Lycoming
	Cessna 402B	Lycoming
Canadair CL-41G	GE	
British Aerospace Bulldog	Lycoming	

3. Other Operators

<u>Company</u>	<u>Aircraft</u>	<u>Engine Type</u>
Hornbill Skyways	Bell	Allison
	Short Brothers	Garrett
	Hawker Siddeley	RR
	Cessna	P&W
	Aerospatiale	Turbomeca
Sabah Air	Bell 212	P&WC
	Bell 206B	Allison
	GAF N22B Nomad	Allison
	Beech King Air	Hartzell
Flight Calibration Unit, Department of Civil Aviation	Beech King Air	P&WC
	Britten Norman	Lycoming
	Cessna	Continental
Boskym Udara	Cessna	Continental
	Piper	Lycoming
	Britten Norman	Lycoming
	Bell	Allison
Pan Malaysia Air Transport	Short Brothers	P&WC
	Bell	Allison
Police Air Unit	Cessna	Continental
	Pilatus	P&WC
Malaysian Flying Academy	Piper PA34	Continental
	Piper PA28 & PA38	Lycoming

Sources: Department of Civil Aviation
Kassim Chan Management Consultants survey

4.0 MARKET PROSPECTS

4.1 Malaysian Airline System Berhad (MAS)

MAS will continue to improve and expand its engineering services for its in-house needs as well as to other airlines.

In addition to the building of a new Hanger and workshop complex at Subang International, MAS plans to upgrade its engineering facilities including maintenance and overhaul of aircraft and components.

MAS's confirmed orders for its B747-400 will be fitted with GE engines. It was also reported that MAS and Thai Airways International have established a technical and work-sharing alliance that would enable both carriers to save substantial maintenance costs in the long term. As the fleet of Thai Airways International (which comprises B747-400, B747-300, B747-200, DC10-30, DC10-30ER, A300 B4-203, A300 C4 Combi, A300-600, MD-11) are fitted with GE engines, it is likely that all MAS's future 747 aircraft and most of the wide-bodied jets will be fitted with GE engines. MAS's purchase of eight Fokker 50 will be fitted with the Pratt and Whitney Canada engine PT6 125.

4.2 Royal Malaysian Air Force (RMAF)

With the reduction in defence and internal security spending under the Fifth Malaysia Plan (1985 to 1990), it is envisaged that RMAF will continue to maintain its present level of expenditure on parts for its existing fleet, unless new purchases of aircraft are made. However, sources have indicated that for the next three-year period, RMAF intends to purchase about C\$4 million of engine components for its F5 aircraft.

V. AVIONICS

V. AVIONICS

1.0 MARKET SIZE

Avionics include products such as electronic flight instrument systems, electronic horizontal situation indicators, turbulence weather radar systems, fuel gauge systems, health and usage monitor systems, flight management systems, automatic test equipment, flight data recorders, engine control and instrumentation systems, etc.. All local requirements are met by imports. However, as official import statistics for these products are categorized by their function and not by area of application and as such, it is not readily possible to isolate products imported for use in the aerospace industry from those for the railways, marine or industrial purposes.

The official statistics classify such product as follows:

<u>SITC</u>	<u>Description</u>
764.530.00	Radio navigation aid apparatus, radar apparatus and radio remote control
874.110.00	Navigational instruments, non-electrical; compasses.
874.810.00	Electronic Automatic Regulators (Controllers).
874.839.00	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus.
874.909.00	Parts/accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus.

Table 3 summarises Malaysia's imports of Avionics and other electrical/electronic equipment over the period 1984 to 1987.

V. AVIGNON

V. AVIONICS

1.0 MARKET SIZE

Avionics include products such as electronic flight instrument systems, electronic horizontal situation indicators, turbulence weather radar systems, fuel gauge systems, health and usage monitor systems, flight management systems, automatic test equipment, flight data recorders, engine control and instrumentation systems, etc.. All local requirements are met by imports. However, as official import statistics for these products are categorised by their function and not by area of application and as such, it is not readily possible to isolate products imported for use in the aerospace industry from those for the railways, marine or industrial purposes.

The official statistics classify such product as follows:

<u>SITC</u>	<u>Description</u>
764.830.00	Radio navigation aid apparatus, radar apparatus and radio remote control apparatus.
874.110.00	Navigational instruments, non-electrical; compasses.
874.810.00	Electronic Automatic Regulators (Controllers).
874.839.00	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus.
874.900.00	Parts/accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus.

Table 8 summarises Malaysia's imports of Avionics and other electrical/electronic equipment over the period 1984 to 1987.

Avionics includes products such as electronic flight instrument systems, electronic horizontal situation indicators, turbulence warning radar systems, fuel gauge systems, health and usage monitor systems, flight management systems, automatic test equipment, flight data recorders, engine control and instrumentation systems, etc. All local requirements are met by imports. However, as official import statistics for these products are categorized by their function and not by area of application and as such, it is not readily possible to isolate products imported for use in the aerospace industry from those for the railways, marine or industrial purposes.

The official statistics classify such product as follows:

SIIC	Description
874.830.00	Radio navigation aid apparatus, radar apparatus and radio remote control apparatus.
874.110.00	Navigation instruments, non-electronic; computers.
874.810.00	Electronic Automatic Registrars (Controllers).
874.830.00	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus.
874.900.00	Part/accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus.

Table 3 summarizes Malaysia's imports of Avionics and other electrical/electronic equipment over the period 1984 to 1987.

TABLE 8
IMPORTS OF AVIONICS AND OTHER ELECTRICAL/
ELECTRONIC EQUIPMENT
1984 TO 1987
(In C\$'000)

<u>SITC</u>	<u>Description</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987+</u>
764.830.00	Radio navigation aid apparatus, radar apparatus and radio remote control apparatus	11,915	8,842	5,311	12,767
874.100.00	Navigational instruments, non-electrical; compasses	4,570	2,760	1,348	3,543
874.810.00	Electronic Automatic Regulators (Controllers)	2,518	3,051	2,698	2,446
874.839.00	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus	28,126	16,171	21,194	27,086
874.900.00	Parts/accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus	21,452	27,048	38,137	30,000
	Total	<u>68,581</u>	<u>57,871</u>	<u>68,688</u>	<u>66,842</u>

Note : + Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

Due to the broad classifications, import statistics if taken at face value will grossly overstate the apparent consumption of avionics. Industry sources indicated that total imports of aircraft parts and avionic equipment for 1985 amounted to C\$74 million. However, purchases of spares for avionics each year is about C\$0.5 million to C\$1.0 million. The nature of the product depends largely on the users' purchasing budget and also on the number for isolated purchases. Therefore, the apparent demand each year may fluctuate considerably.

Local production is confined to component parts of test digital flight data recorders manufactured by Airod Sdn. Bhd. and all production is re-exported to their foreign joint venture partner, Lockheed Aircraft International Services. All parts and materials are imported from Lockheed. Airod also sub-contracts some of this work to a local company, Syarikat Malaysia Explosives Sdn. Bhd. To date, Airod has exported about 200 units to Lockheed valued at about C\$42,000 to C\$48,00 each with a further order for 200 to be delivered by 1988. Airod plans to increase its production to 400 units per annum. Airod will be fully assembling and testing digital flight recorders or "black boxes" locally by the end of 1988.

2.0 INDUSTRY STRUCTURE

The principal suppliers of avionics in this country are Perusahaan GEC Sdn. Bhd., Antah Jardine Aviation Sales Sdn. Bhd., Rockwell-Electronics (Australasia) Pty. Ltd. and Hawker-Pacific (M) Sdn. Bhd.

Other local companies which have some form of representation with their foreign principals or who are supporting aircraft sold to local customers include Bakti Udara Sdn. Bhd. and Gua Musang Sdn. Bhd.

The major brands in the market are Collins, Bendix, Sperry, King, Fairchild and Smiths Industries. Collins avionics dominate the military market segment supplying about 70 percent to 80 percent of the requirements of the RMAF and especially used for the C130, Cessna, MB 339 and Sikorsky. Other brands include Bendix, supplying a comprehensive product range, and Sperry avionics for flight control and flight management systems. The Police Air Unit uses mainly Decca and King avionics while the majority of avionics in the flight inspection aircraft of DCA are sourced from Collins. DCA's aircraft for highway calibration utilise Litton and Bendix avionics for their landing equipment and navigation systems.

In the civilian market segment, a wide range of Sperry avionics are fitted to MAS's fleet which include the DC10, B737 and Airbus. However, 80 to 90 percent of the avionics for the B747-400 are supplied by Collins. These include flight control systems, engine monitoring sensors, distance measuring equipment and auto pilots. Smiths Industries supply MAS field control systems for the B737, fuel management and indicating systems for the A300, flight management systems and engine monitoring systems for the B747, and aircraft clocks for the F27. Fairchild supplies flight data recorders for MAS's fleet. Other operators such as MHS use mainly GEC avionics while Pelangi Air's fleet is fitted mainly with Collins and some Sperry equipment.

Another major area of avionics is flight simulators. Only the national carrier, MAS, owns simulators at present and these are as follows:

FLIGHT SIMULATORS OF MAS

<u>Aircraft Type</u>	<u>Manufacturer</u>	<u>Service Entry</u>
F27	Link-Miles (United Kingdom)	May 1975
B737	C.A.E. (Canada)	September 1982
A300	Thomson-CSF (France)	December 1982
DC10	C.A.E. (Canada)	March 1983

Source: MAS Engineering Services Brochure

MAS has also just ordered a new flight simulator for its B747-400 from Singer Link Miles (SLM), United Kingdom and for its F50's from System Designers Scientific of United Kingdom.

Flight simulators are important to MAS for their in-house training as well as a revenue generator for their engineering department. The major airlines which have signed up with MAS include Pakistan International Airlines and Philippines Airlines for B737 and A300 simulator training time for their pilots while Garuda Indonesia has signed up for DC10 simulator training time. On March 19, 1987, the Civil Aviation Administration of China also contracted for B737 simulator training time. In 1987, MAS earned about C\$2 million from providing simulator flight training and operations handling facilities to third party airlines.

3.0 MARKET PROSPECTS

This is a major market in the aerospace industry and it is projected that there will be major purchases in the near future. It is however a difficult market to penetrate as most of the major avionics components in the aircraft are regarded as industry standards. The replacement market is practically nil in this area as users will tend to purchase from the same manufacturer. There will however be major upgrading of avionics and radar systems by MAS and RMAF over the next 3 years.

3.1 MAS

The payback period for avionics in MAS is on average three years. Thus MAS is expected to replace and upgrade most of its avionics every three years. In December 1986, MAS introduced the Digital Avionics Training programme to enhance its capability in the high technology of a new generation aircraft and digital avionics.

As part of its strategy to promote MAS and to generate revenue for the engineering department, MAS will continue to intensify efforts in the direction of selling simulator training time.

3.2 RMAF

RMAF lags behind in terms of high technology military systems such as air defence systems, navigational systems, early warning systems, airborne warning and control systems and command, control, communication and intelligence systems. RMAF is attempting to close the gaps in its passive air defence system through the implementation of the MADGE (Malaysian Air Defence Ground Environment) programme for which the Hughes Ground Systems Group is the prime contractor. The system provides air surveillance and identification services for civil and military aircraft in airspace of interest to Malaysia.

Meanwhile, RMAF's present aircraft such as the F5 and A4 have a low level of avionics technology and although RMAF needs to optimise the potential capability of these aircraft with some sort of airborne early warning and control systems, this is subject to the availability of funds. Programs to upgrade both the A4 and the A5 however will go ahead within the next two years. In the meantime, RMAF is looking at the possibility of configuring a C-130H into an Aircraft Early Warning platform to enhance its ground-based air defence radars. Industry sources have also indicated two major programmes costing about C\$100 million to be undertaken by RMAF over the next three years. Part of the programmes involve upgrading the radar and avionic systems and is estimated to cost C\$10 to C\$15 million.

Another major plan of RMAF involves a budget of C\$1 billion for the purchase of electronic defence systems. However, it is unlikely that the plan will be implemented over the next 5 years.

RMAF has no flight simulator presently. There are also no plans to purchase any over the next 5 years due to budget constraints and RMAF's other priority areas of development.

VI. AIR TRAFFIC CONTROL

VI. AIR TRAFFIC CONTROL

1.0 MARKET SIZE

Demand for air traffic control equipment is met by imports as there is no local production. The imports of air traffic control equipment for the period 1984 to 1987 are shown in Table 9.

TABLE 9
IMPORTS OF AIR TRAFFIC CONTROL AND OTHER CONTROL EQUIPMENT
1984 TO 1987
(In S\$'000)

SITC	Description	1984	1985	1986	1987*
775.825.00	Electric traffic control equipment for airfields	524	1,652	2,632	137
791.910.00	Railways and tramway fixtures and fittings, mechanical signalling/controlling equipment		4,155	832	2,100
764.838.00	Radio navigational aids, radar and radio remote control apparatus	11,915	9,842	5,311	12,767
874.110.00	Navigational instruments, non electrical, compasses	4,570	2,750	1,368	3,543
	Total	17,826	17,409	10,173	18,547

Note : * Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

As can be seen, imports of air traffic control equipment declined from about S\$18 million in 1984 to S\$10 million in 1986, an average annual decrease of 14 percent. The drop off in imports is largely due to the economic slowdown of the past two years and the smaller budget provided for civil aviation and defence expenditure.

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778.825.00	Electric traffic control equipment for airfields	526	1,652	2,632	137
791.910.00	Railways and tramway fixture and fittings, mechanical signalling/controlling equipment and parts thereof	817	4,155	832	2,100
764.830.00	Radio navigational aids, radar and radio remote control apparatus	11,915	8,842	5,311	12,767
874.110.00	Navigational instruments, non electrical, compasses	<u>4,570</u>	<u>2,760</u>	<u>1,348</u>	<u>3,543</u>
	Total	<u>17,828</u> =====	<u>17,409</u> =====	<u>10,123</u> =====	<u>18,547</u> =====

Note : + Annualised figures based on trade statistics from January to August 1987

Source: Malaysian Trade Statistics, 1984 to 1987

As can be seen, imports of air traffic control equipment declined from about C\$18 million in 1984 to C\$10 million in 1986, an average annual decrease of 14 percent. The drop off in imports is largely due to the economic slowdown of the past two years and the smaller budget provided for civil aviation and defence expenditure.

It should again be noted however, that these import figure may be overstated as the broad classifications encompass a range of products also used for the roads, railways, water ways, etc..

Imports from United Kingdom and U.S.A. dominated the market for 1984 and 1985 constituting more than 50 percent of total foreign purchases. Their market share fell slightly to 45 percent in 1986, while provisional figures for 1987 indicate an improvement to 47 percent market share for these two countries. Canadian exports only amounted to C\$350,904 in 1984, and have been insignificant in subsequent years with sales of only C\$57,808 in 1987.

2.0 INDUSTRY STRUCTURE

2.1 Overview

There are a total of 40 civil airports and aerodromes in Malaysia (See Table 10), of which 4 are international airports. Two are located in Peninsular Malaysia (Penang and Kuala Lumpur) and there is one each in Sabah (Kota Kinabalu) and Sarawak (Kuching).

Malaysian airports are projected to handle a total of 14.2 million passengers by 1990 compared with 10.8 million in 1985; an annual growth rate of 5.6 percent. Domestic passenger traffic is projected to increase at an annual rate of 3.3 percent from 7.3 million in 1985 to 8.6 million in 1990 while international passenger traffic will increase at 9.6 percent from 3.6 million in 1985 to 5.7 million in 1990. 65 percent of passenger traffic and 70 percent of air cargo traffic in Peninsular Malaysia are currently handled at the Subang International Airport in Kuala Lumpur.

To cater to the demand which increasing air traffic is making on existing infrastructure, improvement and upgrading works are planned at various airports across Malaysia. Public development expenditure for transport and communications under the Fifth Malaysia Plan (1986 to 1990) will reach C\$10.2 billion, more than double the amount allocated in the Fourth Malaysia Plan (1981 to 1985). The allocation for civil aviation works has also been increased from C\$500 million in the period 1981 to 1985 to C\$800 million for the current five year period. Public development expenditure for transport and communications for the decade 1981 to 1990 is summarised in Table 11.

Industry sources projected that for the period 1986 to 1990 about C\$100 million will be spent on air traffic control equipment such as air-ground communications, omnirange nav aids, radars, airport control tower equipment, training and other consultancy services.

TABLE 10
CIVIL AVIATION AND AERODROMES IN MALAYSIA

Peninsular Malaysia

<u>State</u>	<u>Location</u>
1. Selangor	Subang (International Airport)
2. Penang	Bayan Lepas (International Airport)
3. Kedah	Alor Setar
4. Perak	Ipoh
5. Kelantan	Kota Bharu
6. Trengganu	Kuala Trengganu
7. Pahang	Kuantan
8. Melaka	Melaka
9. Johore	Johore Bharu
10. Kedah	Pulau Langkawi
11. Pahang	Pulau Tioman

Sarawak (East Malaysia)

1. Kuching (International Airport)
2. Mukah
3. Sibul
4. Simanggang
5. Kapit
6. Bintulu
7. Belaga
8. Long Lellang
9. Marudi
10. Miri
11. Long Seridan
12. Bakelalan
13. Long Sernado
14. Long Sukang
15. Lawas
16. Bario
17. Limbang

Sabah (East Malaysia)

1. Kota Kinabalu (International Airport)
2. Labuan
3. Long Pasia
4. Keningau
5. Renau
6. Kudat
7. Pamol
8. Sandakan
9. Tomangong
10. Lahad Datu
11. Tawau
12. Semporna

TABLE 11
MALAYSIA: PUBLIC DEVELOPMENT EXPENDITURE
FOR TRANSPORT AND COMMUNICATIONS
1981 TO 1990
(In C\$ Million)

<u>Programme</u>	<u>Fourth Plan Allocation, 1981-1985*</u>	<u>Estimated Expenditure, 1981-1985*</u>	<u>Fifth Plan Allocation, 1986-1990*</u>
Civil aviation	500.95	474.86	833.36
Others	<u>5,017.35</u>	<u>4,782.68</u>	<u>9,400.13</u>
Total	<u>5,518.30</u> =====	<u>5,257.54</u> =====	<u>10,233.49</u> =====

Note : * Under the Fifth Plan, the public sector has been redefined to include the non-financial public enterprises (NEPEs) which previously were classified under the private sector.

Source: Fifth Malaysia Plan 1986 to 1990

2.2

Suppliers

The leading suppliers of air traffic control equipment to Malaysia are:

<u>Supplier</u>	<u>Brand/Country of Origin</u>
General Electric Co.	Marconi, United Kingdom
Philips (M) Sdn. Bhd.	Philips, Netherlands
Thomson CSF	Thomson CSF, France
Philcox (based in Manila)	Wilcox, U.S.A.

These lead suppliers enjoy a significant advantage over other suppliers of air traffic control equipment in that they are able to provide a complete package of navigational equipment and are well established internationally. Other suppliers of this equipment include:

<u>Supplier</u>	<u>Brand/Country of Origin</u>
Syarikat Jaya Raya Bhd.	Plessey, United Kingdom
Behn Meyer & Co. (M) Sdn. Bhd.	AWA, Australia
International Aeradio (M) Sdn. Bhd.	IAL, United Kingdom
Bakti Udara Sdn. Bhd.	Loose representation for Raytheon, Canada. Used to hold Raytheon agency
Unirep Sdn. Bhd.	Racal Avionic, United Kingdom
Sumber Teknik Sdn. Bhd.	Audor Communications Inc.

There are currently 8 VHF Omni Radio Range/Distance Measuring Equipment from Wilcox, U.S.A. installed in Malaysia's major airports and one Doppler VOR from AWA, Australia installed in the Subang airport. Airports such as Bayan Lepas, Kuantan, Kuching, Labuan and Subang each has an area control console imported from Australia while the 2 control tower consoles in Subang and Trengganu airports are from Audor Communication Inc. of Canada.

There are seven instrument landing systems in Malaysia two in Subang and one each in Penang, Johor, Kuching, Kota Kinabalu and Pulau Langkawi. Four of these are from Thomson CFS (France) and one each from Philips (Netherlands), Plessey (United Kingdom) and Toshiba (Japan).

Surveillance radars can be classified into long range, medium range and approach radars. Currently, there is one of each type installed at the Subang International Airport. The short range radar is from Raytheon, Canada while the others are from Marconi, United Kingdom.

3.0 MARKET PROSPECTS

During the Fourth Malaysia Plan (1981 to 1985), the Department of Civil Aviation (DCA) was involved with the expansion and modernisation of four international airports namely Subang, Bayan Lepas, Kota Kinabalu and Kuching. In the same period, three domestic airports, Sandakan, Kuala Trengganu and Johor Bharu, which were previously inaccessible to aircraft larger than the F28 were upgraded to accommodate B747s. Other plans to upgrade the Kuantan, Ipoh, Labuan, Sibul and Bintulu airports have been delayed. The Fifth Malaysia Plan (1986 to 1990) will see the completion of the Pulau Langkawi airport costing C\$34 million. Other proposed projects by DCA include:

- o Installation of approach radar in Genting Highlands.
- o Programmes for four airports; one surveillance radar each for Penang, Kota Bharu and Kuching and 2 long range radars and one short range radar for Subang (to be implemented in the Sixth Malaysia Plan).
- o Replacement or upgrading the instrument landing system in Penang, Kuching and Kota Kinabalu airports.
- o Installation of the instrument landing system, area control consoles and VOR/DME in Ipoh airport.
- o Renewal of one VOR/DME in Kuching and two in Kota Kinabalu airports.
- o Installation of a new area control console in the Subang, Kota Bahru and Ipoh airports.
- o Converting the Melaka airport to a general aviation airport mainly for the use of aircraft involved in crop spraying and by small aircraft operators and Malaysian Flying Academy.
- o Consultancy services for drafting of technical specifications on maintenance of air traffic control equipment.
- o Installation of an instrument landing system, area control consoles and VOR/DME in the Sibul airport.

To what extent these projects can be implemented is unknown, as with the government's continuing cash flow concern, departments are being discouraged from engaging in new projects that would increase the debt service ratio. DCA owed the Federal government C\$342 million as at year end 1985 and has been operating at a loss in the past few years. They will have to reduce their expenditure plans over the next couple of years. At present, DCA has received funds for the expansion and upgrading of the Ipoh and Sibu airports. The DCA has also requested open tenders for installation of a new area control console in the Subang airport which should be operating in 1990. To date no tenders have been received from any Canadian companies.

It has in some instances been possible to circumvent DCA's financial problems. For instance, nav aids and communication facilities for the Kerteh airport have been bought and paid for by Petroliaam Nasional Berhad (Petronas) and the Trengganu State Economic Development Corporation. The financiers own and operate the airport while DCA ensures that the aviation standards are adhered to. The Kerteh airport which cost C\$41 million opened in August 1985 to serve the oil drilling operations off the coast of Trengganu. In another project involving the installation of a C\$18 million secondary radar system, a feasibility study was carried out by the French and together with Japanese and other interested parties, soft loans and training packages have been offered to speed up its implementation. However, the status of this project cannot be confirmed.

4.0

TENDER PROCEDURES

DCA is responsible for the development of the country's airports and the provision of navigational aids and communication facilities in Malaysia.

Purchases are usually made through open tender and suppliers are not required to be registered or licenced by the DCA. Major projects for airport development are usually awarded to local engineering consulting firms on a turnkey basis which includes the supply and installation of nav aids. These consultants will in turn engage foreign consultants and purchase equipment as required. The DCA also purchases equipment directly, usually for upgrading or replacement purposes. Although there is no written policy, DCA officials indicated that preference will be given to local suppliers with a minimum of 30 percent Bumiputra participation.

The Jabatan Telekom Malaysia (JTM), on a case by case basis, used to act as the technical consultant and supervised various nav aids projects for the DCA. Syarikat Telekom Malaysia Bhd. (STM) the wholly owned government company which took over the running of telecommunications services from the government as from January 1, 1987 will take over JTM's role in this aspect.

VII. MAINTENANCE, REPAIR AND OVERHAUL SERVICES

1.0 MARKET SIZE

Official estimates of the demand for maintenance, repair and overhaul services are not available. However, independent flight industry analyses provide a good estimate of the size of the market.

75 percent of the maintenance, repair and overhaul requirements of MAS are met by In-house capability. The remainder valued at about US\$5 million is work sent out to O&M or to major airlines such as Japan Air Lines and Garuda Airways.

Commercial operators have an O&M spend about US\$2 million per annum on aircraft maintenance including ground, line and hangar of aircraft. MAS is totally dependent on external facilities for the overhaul and third line maintenance of its aircraft.

The Police and Air Force operators are about US\$ million of maintenance work, most of which goes to the State House in Kuala Lumpur.

VII. MAINTENANCE, REPAIR AND OVERHAUL SERVICES

Official estimates of the demand for maintenance, repair and overhaul services are not available. However, independent flight industry analyses provide a good estimate of the size of the market. On average MAS - 1200 aircraft per annum, of which 700 are overhaul work performed overseas is estimated to amount for US\$ - 10 million. Aired is the major local maintenance and repair centre for MAS's aircraft.

Based on the above, the maintenance, repair and overhaul services market in Malaysia is estimated to be worth about US\$20 million per annum.

2.0 INDUSTRY STRUCTURE

2.1 Malaysian Airlines System Berhad (MAS)

MAS has invested heavily in its own base in Kuala Lumpur to develop and expand its engineering facilities and capabilities not only to meet its own increased operational requirements but also to generate revenue through third party work. MAS reported an increase of 12 percent in component overhaul capability for the year 1986. On revenue generation for the same period, about US\$ million was earned from work handed out for third parties on aircraft maintenance, component overhaul, technical training, engine part testing and electronic equipment calibration. MAS has undertaken an aggressive program to promote the company as a major overhaul agent in ASEAN.

VII. MAINTENANCE, REPAIR AND OVERHAUL SERVICES

1.0 MARKET SIZE

Official estimates of the demand for maintenance, repair and overhaul services are not available. However, indications from industry sources provide a good estimate of the size of the market.

75 percent of the maintenance, repair and overhaul requirements of MAS are met by in-house capability. The remainder valued at about C\$30 million is work sent back to OEMs or to major airlines such as Japan Air Lines and Qantas Airways.

Commercial operators such as MHS spend about C\$25 million per annum on aircraft maintenance including spares. About 80 percent of their maintenance are first and second line maintenance works. MHS is totally dependent on overseas facilities for the overhaul and third line maintenance of its aircraft.

The Police Air Unit annually contracts out about C\$2 million of maintenance work, much of which goes to Wira Kris Udara (M) Sdn. Bhd.

While no official maintenance costs are publicly available for the RMAF fleet of aircraft, industry sources estimate that RMAF spends on average C\$50 - C\$60 million per annum, of which are overhaul work performed overseas is estimated to account for C\$25 - C\$ 35 million. Airod is the major local maintenance and repair centre for RMAF's aircraft.

Based on the above, the maintenance, repair and overhaul services market in Malaysia is estimated to be worth about C\$200 million per annum.

2.0 INDUSTRY STRUCTURE

2.1 Malaysian Airline System Berhad (MAS)

MAS has invested heavily in its main base in Subang to develop and expand its engineering facilities and capabilities not only to meet its own increased operational requirements but also to generate revenue through third party work. MAS reported an increase of 12 percent in component overhaul capability for the year 1986. On revenue generation for the same period, about C\$6 million was earned from works carried out for third parties on aircraft maintenance, component overhaul, technical training, non-destructive testing and electronic equipment calibration. MAS has undertaken an aggressive program to promote the company as a major overhaul agent in ASEAN.

The new MAS Hanger Complex offers MAS the opportunity to expand the scope of its maintenance work. Currently, 25 percent of MAS maintenance work which includes major overhauls, and 55 percent of works done on engine maintenance and overhaul are contracted out. MAS intends to improve its maintenance capability to eventually achieve engineering self-sufficiency. MAS has at least 50 professional engineers and 300 licensed aircraft engineers as part of its technical workforce.

Currently, the component repair capability of MAS stands at 83 percent for Fokker F27 components, 65 percent A300 components, 46 percent for DC10 components and 16 percent for Boeing 747 components. Electrical/electronic components maintenance forms more than half of the present maintenance capability of MAS.

For engines, MAS has full capability to perform hot section inspection on the Roll Royce Dart 532-7/7R and Pratt and Whitney JT 8D engines as well as the auxillary power units. In addition, its capabilities include replacement of modular sections and fan blades on the Rolls Royce RB 211 and General Electric CF6 engines as well as replacement of first and second stage blades on the Pratt and Whitney JT 8D engine.

Some of the major contracts which MAS secured for third party work include the following:

- o Heavy maintenance on an F27 aircraft belonging to Merpati Nusantara Airlines of Indonesia
- o A contract worth C\$3 million for heavy maintenance and aircraft components overhaul 2 Thai Airways International B737 aircraft and 3 Royal Brunei Airlines B737's
- o Heavy maintenance work on a DC10 belonging to World Airways

2.2 Royal Malaysian Air Force (RMAF)

With the privatisation of RMAF's overhaul depot in early 1985, RMAF's engineering capabilities are now mainly confined to the first and second line maintenance of its aircraft. Twenty percent of RMAF's maintenance works are contracted to Airoad while C\$25 million to C\$35 million per annum worth of contracts are for services performed overseas. Total RMAF expenditure on maintenance is estimated at C\$50 - C\$60 million per annum.

RMAF has a technical workforce of about 5,000 personnel and trains 150 technicians a year in countries such as Australia, United Kingdom and United States.

2.3 Airod Sdn. Bhd.

Airod, which is the privatised centre of RMAF's Aircraft and Repair Depot, retains the existing facility and skilled work force which had previously been employed by RMAF. Airod has first refusal on RMAF maintenance requirements and currently performs about 20 percent of this work. However, the award of RMAF's maintenance contract is on a year-to-year basis. At present, contracts from RMAF comprise 85 - 95 percent of Airod's business.

Airod is also a certified Lockheed Hercules Service Centre. The Lockheed-Georgia Company has pledged their full technical and logistic support for Airod to perform repair, overhaul and periodic depot level maintenance of C130/L100 aircraft. Besides this, Airod is in the advanced stage of concluding an agreement to be an authorised service centre for another international aircraft manufacturer.

Some of the international contracts won by Airod include depot level maintenance and refurbishment for two C130/L100 Hercules of the Indonesian Air Force, 2 contracts from the U.S. Air Force for component repair/overhaul of F16 and F4 fighters, repair/electroplating works for MAS, and component repair/overhaul for the Bahrain and Kuwait Air Forces.

Airod will continue to develop new capabilities especially for servicing civilian aircraft and to upgrade its facilities. These include the upgrade of its engine test cell and the building of a new hanger which is scheduled for completion in 1988. In the civilian aircraft market segment, Airod is familiar with the Bell 212 and Dornier 228-200 for depot level maintenance and airworthiness certification. In the engine maintenance area, Airod's experience includes the GE CT-58, CWJ 65-420 and industrial gas turbines. Over the longer term, Airod hopes to achieve the status of a major maintenance and overhaul centre for military and civilian aircraft in the Asia-Pacific region.

2.4 Wira Kris Sdn. Bhd.

Wira Kris' maintenance services revolve around the Police Air Unit which is their most important customer. Other clients in the private sector include foreign and local aircraft operators such as Hornbill Skyways, Malaysian Flying Academy and Sabah Air.

Other activities of Wira Kris include airport charters such as the contract with Esso company to transport personnel to and from Kertih on the east coast of Peninsular Malaysia and contracts for aerial surveys. While their main business is maintenance of aircraft, the company hopes to secure more contracts from the government for aerial surveys, cloud seeding, and from the fisheries department. Wira Kris owns a Piper Aztec for airport charters and a helicopter for its other services.

The Police Air Unit's annual contract with Wira Kris dates back to 1980. With a high utilisation rate, the maintenance contract amounts to C\$2 million annually.

2.5 BFG-Sime Aerospace Services

BFG-Sime is a joint-venture between Dunlop Malaysia Industries (DMIB) and the U.S.A.-based B.F. Goodrich. The company expects to be operational only towards the third quarter of 1988. Three overhaul facilities based in Petaling Jaya, Singapore and Hong Kong will be set up to service various regional airlines. The centres will repair and overhaul aircraft wheels, brakes and more than 15,000 different instruments and avionic systems.

3.0 MARKET PROSPECTS

Although the maintenance budgets of all local aircraft operators are expected to be quite static for the next three years unless new purchases are made, the maintenance suppliers are planning to upgrade their maintenance and engineering capabilities and facilities to compete effectively for overseas contracts and to promote their image as major maintenance service centres in this region.

Airod is also interested to link up with a foreign partner to service civilian aircraft in the Asia-Pacific region. Currently, Airod has no expertise in the major overhauling of civilian aircraft. It also plans to penetrate the market for medium sized U.S. airlines which currently send their aircraft mainly to Europe for servicing. This is now opportune with the Federal Aviation Administration (FAA) retracting its plan to tighten up on the use of foreign repair stations by U.S. airlines.

With MAS's plans to improve its engineering capabilities and to promote the company in the area of maintenance services to other airlines, there may be an opportunity for Canadian firms to in terms of provide engineering consultancy on the upgrading of MAS's maintenance facilities.

Pelanggi air, the new domestic airline, is planning to set up its own first line maintenance facilities by 1990. Currently, maintenance works on its two Twin Otters are contracted to MAS. Pelangi Air is also evaluating the option of contracting to Wira Kris which is involved mainly with smaller aircraft. However, it is not seen to be economically viable to set up a whole range of maintenance facilities in the next three to five years except for first line maintenance.

There is a good potential in the service industry for Canadian companies to tie in with a local company. With cheaper labour costs and the relatively low cost of land as compared to other countries in this region, Malaysia has an inherent advantage as an aviation support centre for the Asia-Pacific region. Malaysia has also provided tax incentives to encourage industrial development and transfer of technology. Both Airod and BFG-Sime Aerospace Services, for instance, have been granted pioneer status by the government which provides for a tax holiday of 5 years, and which in select cases can be extended to 10 years to cater for projects with long gestation periods.

VIII. PROCEDURES AND REGULATIONS

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VIII. PROCEDURES AND REGULATIONS

1.0 DCA's POLICY AND REGULATIONS

1.1 Introduction

The Department of Civil Aviation (DCA) is a government department under the Ministry of Transport. As part of its overall mandate, DCA is responsible for the provision of navigational aids and communication facilities. In this respect, one of its duties, under its flight operation services, includes developing and prescribing requirements for the licensing of air crew; certifying the airworthiness of aircraft and conducting accident investigation and flight calibration of radio navigation aids; providing governmental supervision of air carriers, private and flying club operators and ensuring maintenance of adequate standards of safety in the aircraft engineering and operational fields.

The procedures and regulations relate only to civilian aircraft while those which apply to military aircraft are the responsibility of the Ministry of Defence.

1.2 Certification of Aircraft

The aircraft certification process is described in the document entitled DCA Airworthiness No. 1 and its appendix. (See Appendix J). Although the appendix to Notice No. 1 addresses specifically the certification of aircraft of U.S. origin, it generally applies with slight modification to all aircraft.

DCA Airworthiness No. 1 requires an application to DCA for certification of all aircraft, irrespective of their size, to establish that a level of airworthiness equivalent to that provided by Malaysian airworthiness standards has been achieved. Arrangements for post certification design support should also be made by the applicant to ensure that the certified airworthiness standard may be expected to be sustained after certification.

1.3 Acceptance of Aeronautical Parts

The policy relating to this subject is reflected in Notice No. 11 as presented in Appendix K. A person or organisation accepting aeronautical parts from suppliers and intending to incorporate these parts into an aircraft, its engines, propellers or equipment is responsible for determining that the aeronautical parts are to the required standard and are of acceptable manufacturing origin.

DCA does not approve suppliers or stockists as the onus is placed upon the end-user to ensure that the parts purchased can be traced to original sources substantiated by the original release documents.

1.4 Approval of Organisations (Malaysian based)

The approval of Malaysian based organisations is governed by the British Civil Airworthiness Requirements (BCAR) Section A.

1.5 Approval of Repair/Overhaul Agents Outside Malaysia

The policy relating to repair/overhaul work outside Malaysia as presented in Appendix L can be summarised as follows:

- o Items sent to OEM will not require DCA's approval
- o All "Class One" items, e.g. aircraft, engine, auxillary power unit, propellers and landing gear will require DCA's direct approval
- o Any other items will require DCA's acceptance/approval before the repair agencies can be used. DCA usually accepts such agencies if they hold U.S.A. based, United Kingdom-based and/or Australia-based repair station approvals issued by their respective National Aviation Authorities.

1.6 Licensing of Personnel

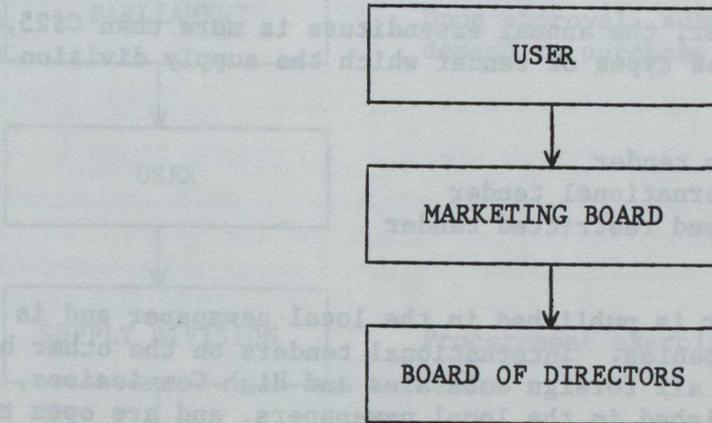
The Malaysian standards relating to the licensing and qualification of personnel is reflected in BCAR Section L Issue 7. DCA will however be adopting BCAR Section Issue 8 on July 1, 1988.

2.0 PURCHASING PROCEDURES

2.1 MAS

MAS is a public-listed company and requires its Board of Directors' approval on purchases of aircraft parts and components of value greater than C\$0.5 million. Each user department will initiate its purchase by submitting their requirements which will be put forward to the Board of Directors by the Marketing Board of MAS.

PURCHASING PROCEDURES IN MAS



For purchases of aircraft, MAS requires direct approval from the Ministry of Finance.

2.2 RMAF

RMAF is directly and solely responsible for local purchases where the value of each item and the annual expenditure incurred is not more than C\$5,000. For such purchases, RMAF will request quotations from a few selected reliable suppliers. Hence the power to purchase is vested in the user department. All other purchases are jointly undertaken by the Ministry of Defence (MINDEF) and Ministry of Finance (Treasury).

2.3 Ministry of Defence (MINDEF)

Following identification of its requirements, the RMAF like the army and navy, submits its request for budget allocation to the Secretary General of MINDEF. Once a discussion is taken to purchase items in its annual budgeting process the Finance Division in MINDEF passes the request to the Treasury Division of the Ministry of Finance. The Treasury will have to review the overall priority of various Ministries before preparing the budget and submission to the Parliament for approval.

Upon approval, the demand to purchase will be submitted to RMAF. The supply division will then carry out the procurement exercise. There are three methods of procurement. If the annual expenditure incurred is more than C\$5,000 but less than C\$25,000 suppliers registered with the Treasury will be invited to quote. The Quotation Board Committee will then consider the quotations.

If however, the annual expenditure is more than C\$25,000, there are three types of tender which the supply division can conduct.

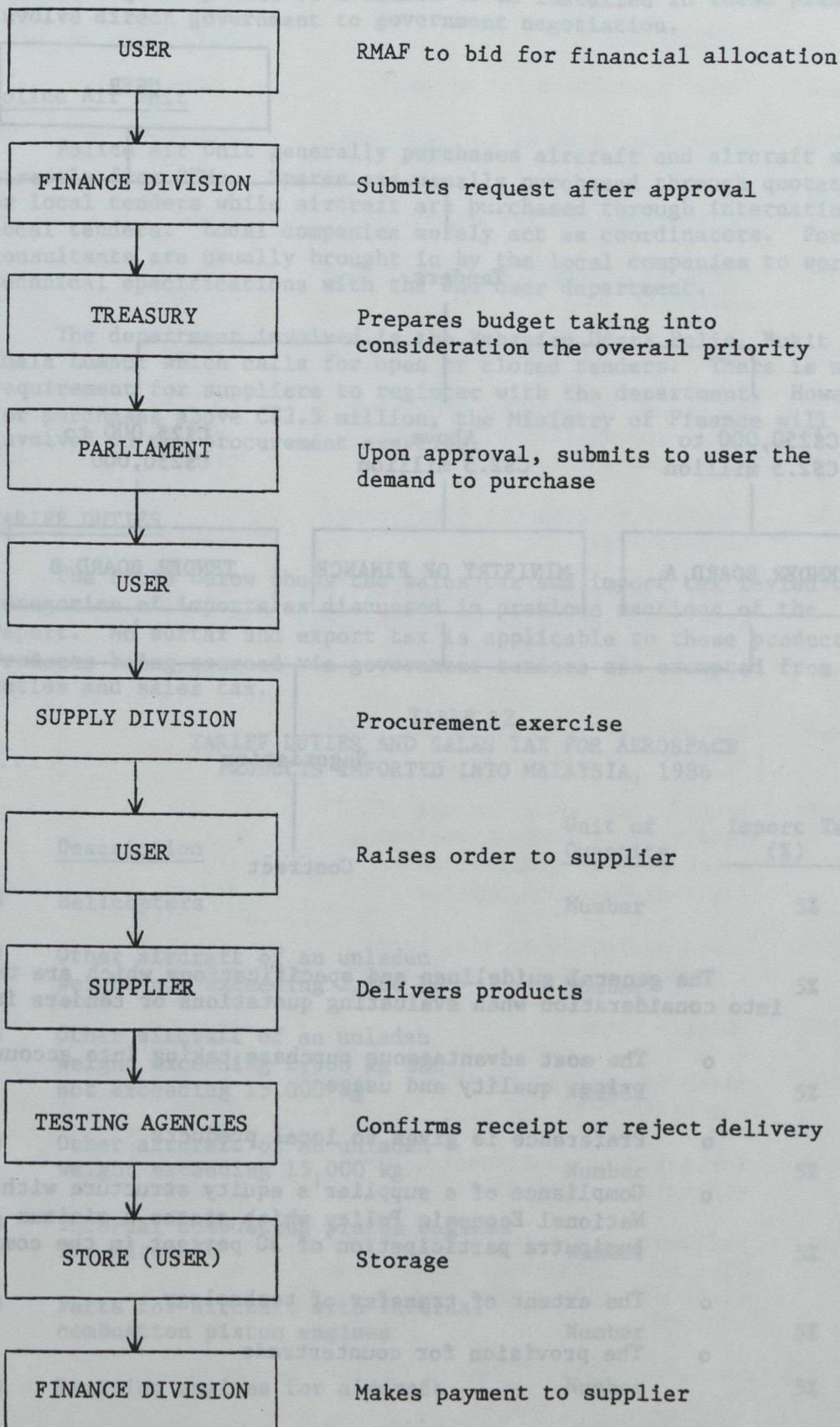
- o Open tender
- o International tender
- o Closed restricted tender

An open tender is published in the local newspaper and is open to all local companies. International tenders on the other hand are circulated to all foreign embassies and High Commissions, as well as being published in the local newspapers, and are open to both local and foreign companies. Restricted or closed tenders are open only to companies invited by MINDEF to bid.

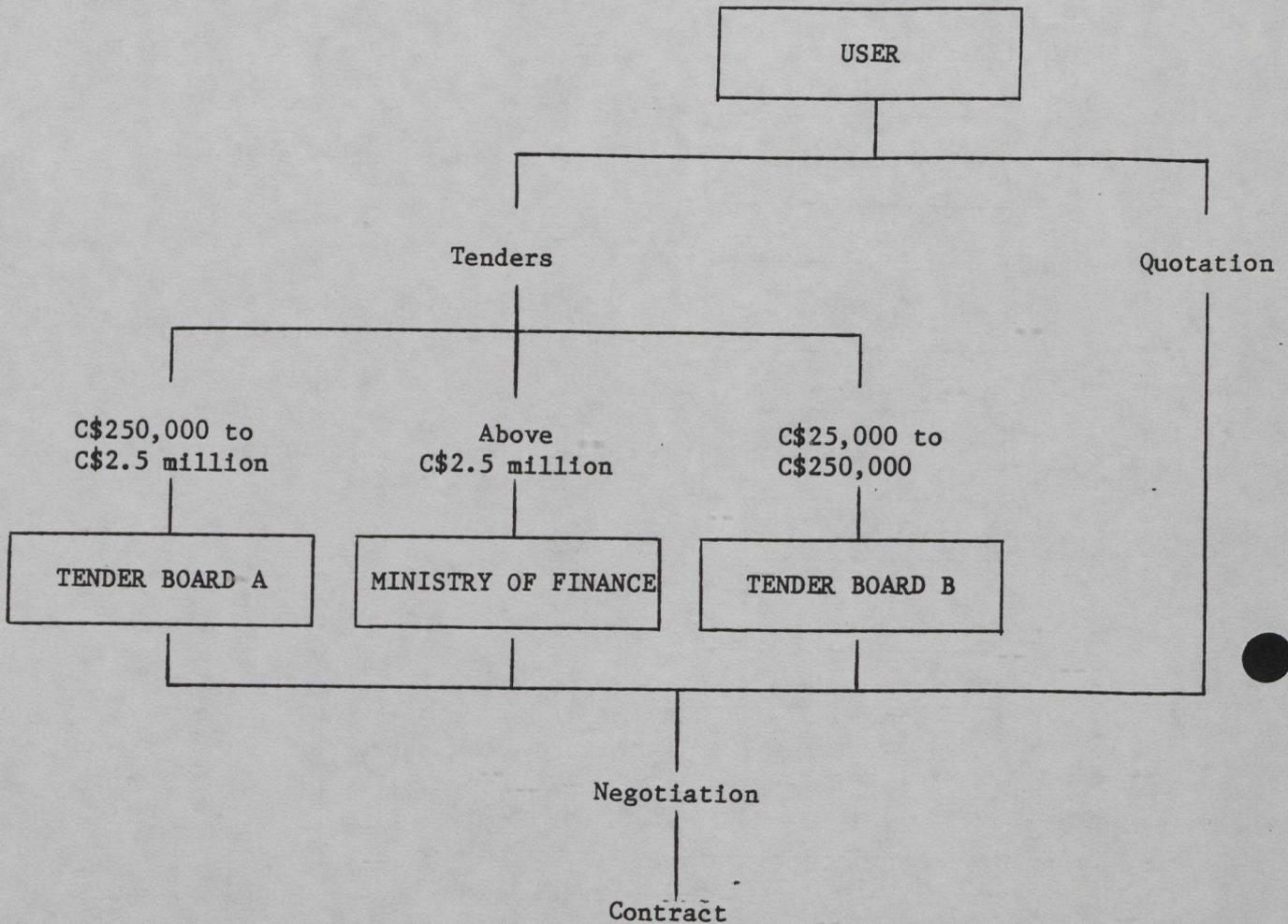
A company which intends to tender for the supply of equipment to the army, navy or air force through MINDEF must first be registered with the Treasury Division of the Ministry of Finance.

All tenders are submitted for evaluation to one of three Tender Board Committees. Tender Board A is responsible for tenders between C\$250,000 to C\$2,500,000 and Tender Board B is responsible for tenders between C\$25,000 to C\$250,000. For contracts exceeding C\$2.5 million, the Ministry of Finance is directly involved in the tender evaluation process.

The procurement concept is depicted as follows:



The purchasing system of MINDEF is as shown below:



The general guidelines and specifications which are taken into consideration when evaluating quotations or tenders include:

- o The most advantageous purchase taking into account price, quality and usage
- o Preference is given to local products
- o Compliance of a supplier's equity structure with the National Economic Policy which states a minimum bumiputra participation of 30 percent in the company
- o The extent of transfer of technology
- o The provision for countertrade

Foreign military sales involving highly specialised equipment such as fighter planes or avionics to be installed in these planes involve direct government to government negotiation.

2.4 Police Air Unit

Police Air Unit generally purchases aircraft and aircraft spares directly from OEMs. Spares are usually purchased through quotations or local tenders while aircraft are purchased through international or local tenders. Local companies merely act as coordinators. Foreign consultants are usually brought in by the local companies to work out technical specifications with the end-user department.

The department involved is the Bahagian Udara Polis, Bukit Aman, Kuala Lumpur which calls for open or closed tenders. There is no requirement for suppliers to register with the department. However for purchases above C\$2.5 million, the Ministry of Finance will be involved in the procurement exercise.

3.0 TARIFF DUTIES

The table below shows the sales tax and import tax levied on the categories of imports as discussed in previous sections of the report. No surtax and export tax is applicable to these products. Products being sourced via government tenders are exempted from tariff duties and sales tax.

TABLE 12
TARIFF DUTIES AND SALES TAX FOR AEROSPACE
PRODUCTS IMPORTED INTO MALAYSIA, 1986

<u>CCCN</u>	<u>Description</u>	<u>Unit of Quantity</u>	<u>Import Tax (%)</u>	<u>Sales Tax (%)</u>
88.02.200	Helicopters	Number	5%	Nil
88.02.300	Other aircraft of an unladen weight not exceeding 2,000 kg	Number	5%	Nil
88.02.400	Other aircraft of an unladen weight exceeding 2,000 kg but not exceeding 15,000 kg	Number	5%	Nil
88.02.500	Other aircraft of an unladen weight exceeding 15,000 kg	Number	5%	Nil
84.06.100	Internal combustion piston engines for aircraft	Number	5%	10%
84.06.200	Parts for aircraft with internal combustion piston engines	Number	5%	10%
84.08.110	Reaction engines for aircraft	Number	5%	10%

TABLE 12 (Cont'd)

<u>CCN</u>	<u>Description</u>	<u>Unit of Quantity</u>	<u>Import Tax (%)</u>	<u>Sales Tax (%)</u>
84.08.210	Turbo propellers for aircraft	Number	5%	10%
84.08.310	Other gas turbines for aircraft	Number	5%	10%
84.08.510	Parts of reaction engines or of turbo propeller for aircraft	Value	5%	10%
88.03.000	Parts of aircraft and associated equipment	Value	5%	N11
40.11.300	Aircraft tyres, pneumatic new	Number	5%	N11
88.05.000	Catapult and similar launching gear, ground flying trainers, parts thereof	Number	5%	0
90.28.100	Electronic automatic regulators (controller)	Number	5%	10%
90.28.390	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus	Number	5%	10%
90.28.400	Non-electric automatic regulators (control units)	Number	5%	10%
90.29.000	Parts/Accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus	Value	5%	10%
85.15.800	Radio navigational aid, radar and radio remote control apparatus	Number	30%	10%
85.15.900	Parts - other	Value	30%	10%
85.16.500	Electric traffic control equipment for airfields	Value	5%	10%
90.14.100	Navigational instruments, non-electrical; compasses	Number	5%	10%
86.10.000	Railway and tramway fixture and fittings; mechanical signalling/controlling equipment and parts thereof	Value	5%	10%

Source: Malaysian Practical Guide to Customs Duties Order

IX. COMPETITIVE FEATURES

1.0 CRITICAL SUCCESS FACTORS

1.1 Presence in the Market

The Malaysian aerospace industry is still too small for OEMs to set up subsidiaries or affiliates to serve the local market. Instead, some OEMs have regional offices to provide customer support and to act as service centres to their customers in the Asia-Pacific region. Each has a virtual monopoly on the servicing and testing of their own components and instruments. It is important to both the military and civilian clients that local representatives be readily accessible when replacement of parts or spare for their Fleet are being considered. If a regional office is not a practical consideration then, some other form of presence in the industry (appointment of local agents, etc.) is necessary.

The reputation and credibility of local agents are important. Local agents survive on good business contacts, establishing themselves as specialists in certain engineering fields and their affiliation with renowned aerospace groups. A good track record is also mandatory.

IX. COMPETITIVE FEATURES

As the local aerospace industry is still relatively young, however major operators like MAS prefer to deal directly with OEMs. Certain OEMs such as Pratt and Whitney and Rolls Royce have set up technical offices to service MAS. Other smaller operators buy through affiliates in other countries. As has been noted elsewhere, MINDEF and other government organisations generally prefer to deal with local companies even for international tenders. Foreign consultants are brought in mainly for technical specifications and consultation.

1.2 Service Turnaround Time

Service turnaround time is an important element of success in Malaysia. The nature of the industry requires a short turnaround time to ensure more productive flight hours. Therefore, parts and equipment stocks must be readily available and delivery time minimised.

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The reputation and credibility of local agents are important. Local agents survive on good business contacts, establishing themselves as specialists in certain engineering fields and their credibility is enhanced by their affiliation with renowned aerospace groups. A good track record is also mandatory.

As the local aerospace industry is still relatively young, however major operators like MAS prefer to deal directly with OEMs. Certain OEMs such as Pratt and Whitney and Rolls Royce have set up technical offices to service MAS. Other smaller operators buy through affiliates in other countries. As has been noted elsewhere, MINDEF and other government organisations generally prefer to deal with local companies even for international tenders. Foreign consultants are brought in mainly for technical specifications and consultation.

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1.3 Close Working Relationship and After Sales Service

A close after sales working relationship with the client is essential, regardless of whether the OEM plays a primary or secondary supporting role. Major contracts can be secured through lobbying for closed tenders using the company products' technical specifications.

1.4 Financing Facilities, Countertrade and Training Packages

The terms and conditions of the finance package accompanying a supplier's quotation can have a direct bearing on the speed of implementation of projects or may influence the government's decision more favourably towards one supplier. Concessional financing is also a factor in major acquisitions. Consideration should be given as well to incorporating a customer training program as part of a bid proposal.

Malaysia is also increasing by imposing a counter trade or offset requirement for aerospace and related product purchases. At least 61 countries around the world demand some form of countertrade in commercial aircraft and engine sales and 23 countries in military-related sales. Aircraft parts and components manufactured domestically under licence for countertrade purposes is seen by the government as a good way to absorb technological skills and create jobs, especially with increasing demand for aerospace products in the Asia-Pacific region.

2.0 ENTRY STRATEGY

As discussed, it is important to maintain a presence in the market. Setting up a representative office to serve the local market can be costly especially since such an operation is not permitted to engage in trading activities. Most foreign companies prefer to have local agents represent them instead. In fact Rockwell-Collins appointed a local agent, Matad Sdn. Bhd., to deal with the military even though they have a representative office in Kuala Lumpur. Azi Trading Co. is the local company used by Also Azbi (M) Sdn. Bhd., the joint-venture company between Azbi Holdings (M) Sdn. Bhd., and IBCOL Technical Services, and Syarikat Dunlop Aviation Sdn. Bhd. to bid on government tenders while IRM (M) Sdn. Bhd. and Gua Musang Sdn. Bhd. are the local agents appointed by Hawker Pacific (M) Sdn. Bhd.

Joint venture arrangements with local companies for the manufacturing of aircraft parts and components or as a repair station is viable only if there exist wider sales opportunities in the region as the local market is too small to support such an operation on its own. However, joint ventures with existing maintenance companies such as Airod would benefit both parties especially with the cheaper labour rate and industrial space in Malaysia.

The success of local and foreign companies in the aerospace industry also depends substantially on their ability to penetrate the government market and this requires a good understanding of the unique aspect of doing business with the Malaysian government. The Malaysian aerospace industry is dominated by three major aircraft operators, MAS, Airod and MHS, all of which are government-owned.

3.0

CANADA'S CAPABILITIES

Certain Canadian aerospace products are relatively well-known in the local industry despite Canada's small share of the import market. These products are restricted to aircraft such as the Dehavilland, Caribou and Twin Otters, Canadair's Challenger, Pratt and Whitney Canada engines, Raytheon radars and C.A.E. flight simulators.

The Caribou has been in operation with the RMAF since May 1966 as a personnel carrier and 14 are still in active service.

The RMAF also acquired two Challenger 600 series aircraft which are used by the Prime Minister for VIP travel.

Four Twin Otters are currently in use by MAS to provide service to outlying domestic routes. The recently established Pelangir Ait also has two Twin Otters.

A recent tender announced by the DCA for the purchase of an area control console met good response from major OEMs including a Canadian supplier.

The Canadian aerospace products reputation in Malaysia however, is mixed. Although the products supplied have always been price competitive and characterised by state of the art technology, there have been instances of poor after sales service, a lack of readily available spare parts, and only limited ongoing contact by the local agent with the buyer. Where the products in question have encountered problems, the response by the manufacturer has been unreliable and this has tarnished the image of Canada in this sector in some quarters.

Further, the general opinion in the market is that although Canadian companies manufacture a range of quality products these are often not known by potential clients and thus are not in a position to effectively compete against traditional suppliers from the U.S., United Kingdom and France. In recent years, the Japanese have also been aggressively marketing their aerospace capability in Malaysia with some success. They have secured a contract to construct the Pulau Langkawi airport, supplying a wide range of aviation products from ground support equipment to air traffic control equipment. Japanese, French and other foreign suppliers have also jointly participated in programmes for upgrading and replacements of navigational aids, providing soft loans and training packages to induce the buyer to proceed more quickly with the project.

While the Canadian presence in the local aerospace market has been modest, this study outlines a number of product and service requirements over the next three years which could be sourced from Canada.

TABLE 2A
TRENDS IN AIRCRAFT BY COUNTRY
1984 TO 1987

Date	No. aircraft	1984		1985		1986		1987	
		GA	CA	GA	CA	GA	CA	GA	CA
01-01-84	100-247,000								
01-01-85	100-247,000	319,772		4,331,478		2,302,293			
	Subtotal	319,772		4,331,478		2,302,293			
01-01-86	Other aircraft of an ultimate weight not exceeding 2,000 kg	45,132							
	France	213,100				89,979		46,227	
	USA					25,975			
	Canada					6,876			
	China								
	United Kingdom								
	Sub-total *	218,032				122,830		7,962,032	
01-01-86	Other aircraft of an ultimate weight exceeding 2,000 kg but not exceeding 15,000 kg	7,168,125		931,930					
	Germany	5,296,749				1,312,036		6,851,617	
	United Kingdom								
	Canada								
	Switzerland								
	Sub-total	7,168,125		931,930		2,624,072		5,856,792	
01-01-87	Other aircraft of an ultimate weight exceeding 15,000 kg			20,779,166		144,341,363			
	Sub-total			20,779,166		144,341,363			
TOTAL		7,919,697		25,952,344		199,056,956		14,829,711	

EXHIBITS

Exhibit 1

MALAYSIA: IMPORTS OF AIRCRAFT BY COUNTRY
1984 TO 1987

<u>SITC</u>	<u>CCCN</u>	<u>DESCRIPTION</u>	<u>1984</u> C\$	<u>1985</u> C\$	<u>1986</u> C\$	<u>1987</u> C\$
792.100.00	88.02.200	Helicopters	319,772	4,331,478	2,382,293	-
		France	-	-	-	-
		United Kingdom	-	-	-	-
		USA	-	-	3,244,974	96,155
		Sub-total	319,772	4,331,478	5,627,267	96,155
792.200.00	88.02.300	Other aircraft of an unladen weight not exceeding 2,000 kg	45,733	-	-	-
		USA	213,100	-	-	46,727
		Canada	-	-	89,970	-
		China	-	-	25,995	-
		United Kingdom	-	-	6,896	-
		Sub-total	258,833	-	122,861	7,862,037
792.300.00	88.02.400	Other aircraft of an unladen weight exceeding 2,000 kg but not exceeding 15,000 kg	2,146,135	532,910	-	3,375
		Germany	5,254,749	-	-	6,851,417
		United Kingdom	-	532,910	-	-
		Canada	-	-	1,312,034	-
		Switzerland	-	-	8,173,485	-
		Sub-total	7,400,884	532,910	9,485,519	6,854,792
792.400.00	88.02.500	Other aircraft of an unladen weight exceeding 15,000 kg	-	20,729,146	144,821,343	-
		USA	-	20,729,146	144,821,343	-
		Sub-total	-	20,729,146	144,821,343	-
		TOTAL	7,979,489	25,593,534	160,056,990	14,859,711

MALAYSIA: IMPORTS OF AIRCRAFT PARTS AND ENGINES BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
792.900.00	88.03.000	Parts of aircraft and associated equipment				
		Australia	71,114	165,468	181,802	100,879
		Canada	150,418	325,926	154,153	325,581
		Denmark	30,968	33,715	207,926	111,370
		France	5,667,281	7,045,209	7,546,681	5,240,123
		Germany	422,041	958,479	2,899,465	369,933
		Japan	66,843	60,326	446,273	2,068,415
		Netherlands	2,428,944	1,325,015	1,105,985	1,662,540
		Philippines	2,106	1,732	492,545	3,351
		Singapore	484,869	631,304	335,116	447,072
		Switzerland	69,247	20,926	864,390	87,406
		United Kingdom	5,145,555	6,493,144	7,450,301	6,712,965
		USA	22,068,898	34,531,970	53,325,850	42,627,502
		Others	177,512	35,999	154,364	503,636
		Sub-total	36,785,796	51,629,213	75,164,851	60,260,773
713.110.00	84.06.100	Internal combustion piston engines for aircraft				
		Australia	-	223,971	1,777,487	9,045
		Germany	321,801	-	1,753,005	8,909,717
		Singapore	-	125,044	41,715	-
		Taiwan	-	-	51,141	-
		United Kingdom	9,473,015	1,204,416	2,130,166	19,622,193
		USA	48,487,491	32,455,508	59,004,474	63,662,857
		Canada	-	-	-	384,617
		Japan	-	-	-	1,410
		Sub-total	58,282,307	34,008,936	64,757,988	92,589,839
713.190.00	84.06.200	Parts for aircraft with internal combustion piston engines				
		France	246,760	113,574	422,966	5,049
		Germany	7,467,589	3,373,129	827,733	1,288,208
		Japan	1,957	932	26,158	3,260
		Netherlands	4,907,289	9,093	37,189	4,393
		Singapore	24,605	61,235	35,838	21,783
		United Kingdom	8,692,220	5,458,471	5,550,743	4,084,865
		USA	22,422,926	25,964,285	15,073,508	22,876,023
		Canada	1,408	1,473	-	3,930
		Others	5,238	15,524	6,261	2,633
		Sub-total	43,769,992	34,997,716	21,980,396	28,290,144

Exhibit 2 (Cont'd)

<u>SITC</u>	<u>CCCN</u>	<u>DESCRIPTION</u>	<u>1984</u> C\$	<u>1985</u> C\$	<u>1986</u> C\$	<u>1987</u> C\$
792.830.00	88.05.000	Catapults and similar launching gear, ground flying trainers, parts thereof	55,343	1,050	91	-
		France	58,491	6,295	-	5,631
		Hong Kong	516	-	-	-
		Singapore	10,904	-	-	-
		Sweden	121	-	-	-
		USA	88,403	73,358	17,207	414
		India	-	-	-	2,292
		Switzerland	-	-	-	7,014
		Taiwan	-	-	-	1,121
		United Kingdom	-	-	-	3,618
		Sub-total	213,778	80,703	17,298	20,089
625.300.00	40.11.300	Aircraft tyres, pneumatic new	1,613	-	-	-
		Australia	2,273	67,164	23,088	3,881
		Brazil	21,192	765	66,811	-
		France	178	219	5,497	-
		Germany	13,307	16,434	6,326	14,118
		Japan	48,381	1,678	-	-
		Luxembourg	1,048	8,459	1,578	2,520
		Singapore	137,580	88,384	61,214	5,679
		Thailand	23,757	84,259	62,590	117,549
		United Kingdom	148,736	96,747	72,487	57,116
		USA	-	-	-	7,762
		Canada	-	867	11,386	4,318
		Others	-	-	-	-
		Sub-total	398,065	364,976	310,977	212,943
714.410.00	84.08.110	Reaction engines for aircraft	326,087	-	-	-
		Norway	1,400,854	2,189,678	1,574,003	-
		United Kingdom	-	39,817	5,106,351	-
		U.S.A.	-	-	980,101	-
		France	-	-	-	236,426
		Sub-total	1,726,941	2,229,495	7,660,455	236,426
714.811.00	84.08.210	Turbo propellers for aircraft	2,288,343	4,096,965	4,529,193	6,264,338
		United Kingdom	21,925	-	-	298,266
		U.S.A.	-	-	-	359
		Germany	-	-	-	-
		Sub-total	2,310,268	4,096,965	4,529,193	6,562,880

Exhibit 2 (Cont'd)

<u>SITC</u>	<u>CCCN</u>	<u>DESCRIPTION</u>	<u>1984</u> C\$	<u>1985</u> C\$	<u>1986</u> C\$	<u>1987</u> C\$
714.881.00	84.08.310	Other gas turbines for aircraft	318,683	223,650	223,302	-
		France	4,389,820	79,859	-	-
		Germany	2,937,985	1,717,658	4,480,846	5,082
		U.S.A.	-	-	5,725	-
		United Kingdom	-	-	-	-
		Sub-total	<u>7,546,488</u>	<u>2,021,167</u>	<u>4,709,873</u>	<u>5,082</u>
714.911.00	84.08.510	Parts of reaction engines or of turbo propeller for aircraft	5,484	57,886	32	300
		Netherlands	177,796	520,136	106,963	-
		United Kingdom	59,143	115,356	88,458	560
		U.S.A.	-	43	5,679	2,747
		Singapore	-	-	1,583	260
		Australia	-	-	1,010	-
		France	-	-	-	-
		Sub-total	<u>242,423</u>	<u>693,421</u>	<u>204,402</u>	<u>3,867</u>
		TOTAL	<u>151,276,058</u>	<u>130,122,592</u>	<u>179,335,433</u>	<u>186,182,043</u>

Exhibit 3

MALAYSIA: IMPORTS OF AVIONICS AND OTHER ELECTRICAL/
ELECTRONIC EQUIPMENT BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984	1985	1986	1987
			C\$	C\$	C\$	C\$
874.810.00	90.28.100	Electronic automatic regulators (controllers)				
		Australia	130,613	178,679	150,679	62,190
		Canada	93,041	4,112	8,042	40,344
		France	130,753	107,828	107,123	198,450
		Germany	130,817	177,226	85,667	98,704
		Italy	358,840	172,374	204,863	154,712
		Japan	1,630	333,772	690,613	784,467
		Singapore	20,052	117,834	73,247	118,873
		Sweden	28,680	119,913	16,094	293,385
		Taiwan	45,074	26,967	52,520	32,944
		United Kingdom	564,139	853,673	358,326	282,999
		USA	487,472	875,903	745,734	301,385
		Others	526,602	82,454	204,930	77,111
		Sub-total	2,517,713	3,050,735	2,697,838	2,445,564
874.839.00	90.28.390	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus				
		Australia	72,990	16,821	19,551	10,503
		Belgium	34,392	136,826	6,036	-
		Canada	19	53,539	338,519	56
		Denmark	471,700	428,307	222,423	214,803
		France	561,386	247,681	269,056	266,181
		Germany	912,803	613,011	702,937	732,885
		Italy	669,074	411,701	432,531	372,190
		Japan	12,105,675	3,551,989	2,320,209	7,799,575
		Netherlands	376,332	16,030	82,646	36,936
		Singapore	1,332,886	552,999	801,121	402,375
		Sweden	314,941	137,234	434,089	191,303
		Switzerland	27,589	262,672	60,901	604,689
		United Kingdom	993,545	770,948	2,703,973	811,217
		USA	10,005,960	8,715,130	12,464,989	15,460,591
		Others	247,086	255,767	334,763	183,004
		Sub-total	28,126,378	16,170,655	21,193,744	27,086,308

SITC	CCCN	DESCRIPTION	1984				1985				1986				1987				
			C\$		C\$		C\$		C\$		C\$		C\$		C\$				
874.840.00	90.28.400	Non-electronic automatic regulators (control units)	590		3,361		129	1,492											
		Australia	90		910		486	70											
		Canada	10,538				197												
		Denmark	34,153				194												
		France	19,204				6,161	2,769											
		Germany	1,078		12,061		1,869	9											
		Hong Kong	19,528		1,869		310	561											
		Italy	47,703		80,752		37,762	115,852											
		Japan	488		2,143		96												
		Netherlands	293																
		Norway	34,995		2,168		5,404	12,179											
		Singapore	60,538		185,291		118,884	30,760											
		Spain	296		729		546												
		Sweden	130				366												
		Switzerland	428		4,630		5,154	12,267											
		Taiwan	236,622		128,770		23,025	99,434											
		United Kingdom	23,070		54,913		90,664	22,421											
		USA			307		849	10,505											
		Others																	
		Sub-total	489,744		478,214		291,786	308,325											
874.900.00	90.29.000	Parts/accessories for use with measuring, checking, analysing, automatically controlling instruments and apparatus	200,666		125,575		161,887	72,303											
		Australia	262,881		105,163		12,791	3,600											
		Belgium	283,336		823,833		324,416	94,142											
		France	45,868		37,667		80,322	6,912											
		Canada	457,689		1,204,140		2,161,007	1,395,919											
		Germany	177,620		222,295		749,727	222,328											
		Hong Kong	125,233		135,606		195,880	50,124											
		Italy	2,923,511		3,058,792		5,507,232	2,543,880											
		Japan	159,861		312,601		325,286	238,164											
		Netherlands	1,696,275		1,855,571		2,743,401	1,147,752											
		Singapore	235,737		79,109		175,250	37,664											
		Sweden	101,237		302,613		381,222	303,505											
		Switzerland	2,290,248		4,485,275		1,749,270	1,749,270											
		United Kingdom	11,413,920		14,372,953		19,970,491	12,729,303											
		USA	1,077,821		809,955		862,541	404,967											
		Others																	
		Sub-total	21,451,903		27,047,914		38,136,728	20,999,833											
		TOTAL	52,585,738		46,747,518		62,320,096	50,840,030											

STATISTICS CANADA

MALAYSIA: IMPORTS OF AIR TRAFFIC CONTROL AND OTHER
CONTROL EQUIPMENT BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
778.825.00	85.16.500	Electric traffic control equipment for airfields				
		Australia	34,421	41,598	762,503	1,170
		Belgium	24,048	24,189	-	477
		Canada	67,320	513	-	-
		Finland	115,542	9,570	431,863	1,583
		France	1,048	872	59,858	45,571
		Germany	146,455	4,665	273	42
		India	9,982	2,035	6,105	-
		Italy	8,196	1,932	1,072,652	-
		Japan	1,563	5,923	-	3,556
		Netherlands	2,261	610	-	28,785
		United Kingdom	100,503	138,583	28,368	3,411
		USA	14,350	1,326,524	107,288	51,071
		Norway	-	95,286	-	-
		Singapore	-	1,294	985	902
		New Zealand	-	-	160,358	-
		Sub-total	525,689	1,651,662	2,632,185	136,568
791.910.00	86.10.00	Railway and tramway fixture and fittings; mechanical signalling/ controlling equipment and parts thereof				
		Australia	25,695	59,172	22,287	1,830
		France	27,820	20,187	24,789	96
		Germany	151,569	8,558	488,069	2,051,814
		Italy	11,562	195	91,084	886
		Japan	337,883	12,605	26,661	182
		Netherlands	11,986	-	21,760	2,105
		Singapore	16,802	10,258	16,457	31,688
		United Kingdom	109,542	121,301	30,108	10,641
		USA	99,413	47,621	-	261
		Poland	-	3,759,947	-	-
		Others	25,152	114,799	110,323	588
		Sub-total	817,424	4,154,643	831,538	2,100,091
764.830.00	85.15.800	Radio navigational aid, radar and radio remote control apparatus				
		Australia	94,426	437	2,352	14,483
		Canada	283,584	-	-	57,808
		France	500,732	644,548	156,959	281,449
		Germany	842,173	39,503	1,026,989	31,647
		Italy	85,092	37,384	16,324	5,649
		Japan	4,590,394	311,216	502,197	5,731,855
		Netherlands	74,654	895,630	64,213	50,135
		Singapore	109,026	32,049	37,119	9,119
		Sweden	12,278	1,192,960	65,004	62,210
		Switzerland	463	144,025	25,663	241,440
		United Kingdom	1,667,959	1,395,833	894,893	408,093
		USA	3,584,184	4,089,851	2,512,323	5,872,507
		Others	69,846	58,385	7,202	346
		Sub-total	11,914,811	8,841,821	5,311,238	12,760,741

Exhibit 4 (Cont'd)

SITC	CCCN	DESCRIPTION	1985 C\$	1986 C\$	1987 C\$
874.110.00	90.14.100	Navigational instruments, non-electrical; compasses	432,433	163,088	291,018
			21,364	6,202	558,608
			66,156	111,269	143,690
			16,322	8,301	37,788
			152,218	23,111	11,148
			460,864	399,075	416,853
			3,390,480	598,249	1,986,275
			30,653	38,786	97,934
			4,570,490	1,348,081	3,563,314
		Sub-total	17,828,414	10,123,042	18,546,714
		TOTAL	-----	-----	-----

1987 TO 1993
COMPOSITE NATIONAL INVENTORY
STATISTICAL REPORT ON THE STRATEGIC COMMERCE AND TRADE

MALAYSIA: EXPORTS AND RE-EXPORTS OF AIRCRAFT BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
792.100.00	88.02.00	Helicopters	-	-	81,967	11,538
		U.S.A.	-	-	230,866	-
		United Kingdom	6,521,739	3,363,788	-	-
		Luxembourg	-	248,415	-	-
		Sub-total	6,521,739	3,612,203	312,833	11,538
792.200.00	88.02.300	Other aircraft of an unladen weight not exceeding 2,000 kg	-	2,173	2,459	15,974
		Philippines	-	-	-	-
		Singapore	-	2,173	-	15,974
		Sub-total	-	2,173	2,459	15,974
792.300.00	88.02.400	Other aircraft of an unladen weight exceeding 2,000 kg but not exceeding 15,000 kg	-	-	142,541	-
		Indonesia	-	-	21,858	-
		Thailand	-	-	739,261	-
		U.S.A.	2,402,399	-	-	-
		Netherlands	-	-	-	8,846
		Switzerland	-	-	-	46,494
		Taiwan	-	-	-	-
		Sub-total	2,402,399	-	903,660	55,340
792.400.00	88.02.500	Other aircraft of unladen weight exceeding 15,000 kg	-	-	-	4,977
		Singapore	-	-	-	4,977
		Sub-total	-	-	-	4,977
		TOTAL	8,924,138	3,614,376	1,218,952	87,829

MALAYSIA: EXPORTS AND RE-EXPORTS OF AIRCRAFT PARTS AND ENGINES BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
792.900.00	88.03.000	Parts of aircraft and associated equipment	10,121,931	9,801,482	8,149,857	5,572,137
		Australia	5,431,792	5,601,166	1,109,345	155,199
		Belgium	340,488	239,897	511,549	-
		Brunei Darussalam	199,772	175,726	122,417	292,821
		Canada	4,580,109	8,346,638	4,800,189	2,374,983
		France	36,582,903	10,090,974	3,049,993	4,241,407
		Germany	6,163,982	1,645,325	352,842	132,972
		Hong Kong	11,390,283	716,599	10,190	133,221
		India	1,124,420	2,799,584	2,330,743	3,021,469
		Japan	3,188,078	2,060,279	470,222	190,623
		Netherlands	7,302,897	12,914,109	17,491,842	12,864,798
		Singapore	162,352	87,821	117,819	352,405
		Thailand	19,322,972	14,965,293	11,050,238	6,548,085
		United Kingdom	19,640,909	21,506,742	17,559,508	15,806,433
		USA	3,706,001	1,419,859	603,196	1,093,251
		Others	-	-	-	-
		Sub-total	129,258,889	93,371,494	67,729,950	52,779,804
713.110.00	84.06.100	Internal combustion piston engines for aircraft	1,275,821	1,681,044	24,395,931	11,716,704
		Australia	1,068,750	14,869,566	3,481,116	-
		Belgium	6,747,974	7,637,104	15,148,932	4,076,923
		Germany	-	-	-	-
		Indonesia	-	-	-	-
		Japan	-	203,804	8,197,489	-
		Netherlands	-	543,478	2,185,743	13,070,312
		New Zealand	-	706,563	819,672	-
		Singapore	688,897	4,690,184	1,898,406	30,409,390
		United Kingdom	5,090,587	2,806,500	16,187,973	13,810,461
		U.S.A	2,712,986	-	190,297	-
		Canada	180,507	-	-	-
		China	590,110	-	-	-
		Hong Kong	2,445,652	4,891,304	-	10,576,923
		Taiwan	200,318	1,089,531	-	-
		France	-	2,514,760	0	3,076,923
		Sub-total	21,001,602	41,633,838	73,434,521	86,737,636

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
713.190.00	84.06.200	Parts for aircraft with internal combustion piston engines	742,874	742,309	2,556,338	2,436,317
			415,949	1,345,537	260,046	44,182
			23,203	51,749	14,831	-
			205,935	252,538	189,214	3,846
			2,340,993	2,662,834	1,312,129	5,839,043
			76,599	79,833	54,716	501,486
			59,278	40,801	262,581	35,299
			1,941,249	2,101,238	3,900,134	1,890,732
			678,611	2,619,770	711,821	1,229,457
			1,502,900	1,653,486	19,280	1,547,809
			146,834	166,753	-	-
			532,782	98,018	42,742	61,449
		Sub-total	8,667,207	11,814,866	9,323,832	13,589,620
792.830.00	88.05.00	Catapults and similar launching gear; ground flying trainees; parts thereof	-	-	1,639	-
			-	-	647	-
			2,163	15,377	-	7,692
		Sub-total	2,163	15,377	2,286	7,692
625.300.00	40.11.300	Aircraft tyres, pneumatic new	913	815	544	13,487
			1,952	-	-	1,673
			3,257	-	-	-
			9,812	14,330	14,813	7,797
			49,680	66,046	-	3,846
			475,744	1,184,902	909,109	774,437
			19,837	-	-	-
			145,404	129,346	-	-
			14,403	-	-	-
			-	36,234	-	16,338
			-	-	7,766	-
			-	-	5,813	-
			-	-	-	28,462
			-	-	-	6,743
		Sub-total	721,002	1,433,673	938,045	852,781

Exhibit 6 (Cont'd)

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
714.410.00	84.08.110	Reaction engines for aircraft	1,068,750	-	-	-
		Singapore	326,087	-	-	786,503
		United Kingdom	-	375,000	272,478	2,917
		Brunei Darussalam	-	-	719,336	-
		Malaysia (Peninsular)	-	-	122,951	-
		Sub-total	1,394,837	375,000	1,114,765	789,420
714.811.00	84.08.210	Turbo propellers for aircraft	251,877	-	-	-
		China	616,251	331,897	-	692,307
		Taiwan	2,493,370	380,435	-	-
		United Kingdom	280,441	564,022	-	-
		U.S.A.	-	-	-	1,533,032
		Australia	-	-	-	-
		Sub-total	3,641,939	1,276,354	-	2,225,339
714.881.00	84.08.310	Other gas turbines for aircraft	5,343,750	-	-	-
		Belgium	181,632	-	-	-
		Brunei Darussalam	6,503,961	380,435	1,073,246	295,170
		Germany	4,507,651	-	37,432	-
		Singapore	-	-	-	-
		France	-	-	-	-
		Sub-total	16,536,994	380,435	1,110,678	295,170
714.911.00	84.08.510	Parts of reaction engines or of turbo propellers for aircraft	569,005	-	535,519	-
		Australia	698,973	230,161	-	-
		U.S.A.	-	-	-	-
		Sub-total	1,267,978	230,161	535,519	-
		TOTAL	182,492,611	150,531,198	154,189,596	157,277,464

MALAYSIA: EXPORTS AND RE-EXPORTS OF AIR TRAFFIC CONTROL AND OTHER CONTROL EQUIPMENT BY COUNTRY 1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
778.825.00	85.16.500	Electric traffic control equipment for airfields	-	-	1,148	-
					84,637	7,101
				2,185	1,731	-
				2,446	-	-
				-	-	1,155
		Sub-total	-	4,631	87,516	8,256
791.910.00	86.10.000	Railway and tramway fix and fittings; mechanical signalling/controlling equipment and parts thereof	-	2,568	2,623	-
				8,275	27	-
			49,485	293	1,290	19,570
			-	-	60	-
		Singapore	69,894	219,275	266,336	7,376
		Taiwan	-	-	314	-
		United Kingdom	-	-	5,861	-
		U.S.A.	-	-	454	-
		Canada	3,750	-	-	-
		Japan	22	1,119	-	-
		Australia	-	25	-	-
		Bahrain	-	76	-	-
		Hong Kong	-	54	-	-
		Thailand	-	266	-	-
		Sub-total	123,151	231,951	276,965	26,946
764.830.00	85.15.800	Radio navigational aid, radar and radio remote control apparatus	234,321	111,147	445,656	103,396
			291,399	1,881	109,005	1,989
			32,636	9,783	12,393	18,462
		Brunei Darussalam	-	-	101,376	-
		Canada	153,709	330,371	5,578,261	18,746
		France	20,304	45,728	134,597	35,229
		Japan	446,658	193,184	1,761,313	280,905
		Singapore	758,902	569,009	1,183,259	372,757
		United Kingdom	1,630,258	793,996	9,200,344	268,133
		USA	70,416	215,640	456,261	34,609
		Others	-	-	-	-
		Sub-total	3,638,603	2,270,739	18,982,465	1,134,226

Exhibit 7 (Cont'd)

			1984	1985	1986	1987
			C\$	C\$	C\$	C\$
			50,772	211,261	408,546	197,792
			17,608	27,806	44,799	31,761
			3,467	21,060	110,127	50,937
			9,159	-	5,740	-
			206,648	121,346	136,043	595,434
			100,255	222,765	329,383	364,276
			362,285	9,592	2,780	54,710
			36,685	30,356	20,694	2,353
			<u>786,879</u>	<u>644,186</u>	<u>1,056,112</u>	<u>1,297,263</u>
			4,548,633	3,151,507	20,405,058	2,466,691
			<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>

DESCRIPTION

Navigational instruments, non-electrical; compasses

CCCN

90.14.100

SITC

874.110.00

Australia
France
Japan
Philippines
Singapore
United Kingdom
USA
Others
Sub-total

TOTAL

MALAYSIA: EXPORTS AND RE-EXPORTS OF AVIONICS AND ELECTRICAL/
ELECTRICAL EQUIPMENT BY COUNTRY
1984 TO 1987

SITC	CCCN	DESCRIPTION	1984 C\$	1985 C\$	1986 C\$	1987 C\$
874.810.00	90.28.100	Electronic automatic regulators (controllers)				
		Australia	7,265	36,325	-	6,338
		Brunei	3,022	1,576	-	220,391
		France	65	-	-	831
		Germany	10,757	866	5,779	12,369
		Hong Kong	27	-	-	-
		Indonesia	65,345	82	-	-
		Japan	11,058	2,234	8,130	54,405
		Netherlands	344	-	-	-
		Singapore	20,683	99,169	172,261	235,768
		Sri Lanka	2,838	27	-	-
		United Kingdom	1,105	19,173	1,176,914	1,004,319
		U.S.A.	3,816	756,125	10,539	3,105
		Italy	-	2,391	-	25,378
		Thailand	-	2,529	9,699	26,433
		Others	-	1,007	410	22,941
		Sub-total	126,325	921,504	1,383,732	1,612,278
874.839.00	90.28.390	Other electronic measuring, checking, analysing or automatically controlling instruments and apparatus				
		Italy	-	2,364	24,978	-
		Japan	-	1,654	112,350	204,225
		Singapore	-	37,930	818,795	505,108
		Thailand	-	6,035	745	-
		United Kingdom	-	9,848	261,998	24,069
		USA	-	-	113,467	150,622
		Canada	-	-	-	385
		Others	-	5,092	100,187	46,821
		Sub-total	-	62,923	1,432,520	931,230
874.840.00	90.28.400	Non-electronic automatic regulators (control unit)				
		Japan	39	26	-	-
		Singapore	7,697	1,889	5,867	5,534
		Denmark	-	297	-	-
		Germany	-	457	1,883	1,923
		Hong Kong	-	1,433	-	-
		Spain	-	2,391	-	-
		United Kingdom	-	-	-	34,017
		Others	-	-	266	-
		Sub-total	7,736	6,493	8,016	41,474

SURVEY QUESTIONNAIRE ON THE AEROSPACE PRODUCTS
AND SERVICES INDUSTRY IN MALAYSIA
(Representatives/Distributors/Manufacturers)

A. GENERAL

Name of Company : _____

Address : _____

SAMPLE OF SURVEY QUESTIONNAIRES

Business Contact Person : _____

Telephone/Telex : _____

Nature of Business : _____

Size of Company : _____

Ownership	Name	Nationality	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Agencies Held : _____

Interview Date : _____

SURVEY QUESTIONNAIRE ON THE AEROSPACE PRODUCTS
AND SERVICES INDUSTRY IN MALAYSIA
(Representatives/Distributors/Manufacturers)

A. GENERAL

Name of Company :

Address :

Business Contact Person :

Telephone/Telex :

Nature of Business :

Size of Company :

Ownership :

Name

Nationality

%

Agencies Held :

Interview Date :

B. PRODUCT RANGE/SPECIALIZATION

Aircraft

Brand/Type

- 1) Aircraft
- 2) Helicopter

Aircraft Parts and Engines

- 1) Aircraft material, parts and associated equipment
- 2) Engines and engine parts
- 3) Others

Avionics

- 1) Avionics and related equipment
- 2) Flight simulators
- 3) Others

Air Traffic Control

- 1) Surveillance Radar
- 2) Instrument Landing Systems
- 3) Navigational Aids
- 4) Area Control Consoles and Control Tower Consoles

Maintenance, Repairs and Overhaul Services

- 1) Aircraft Repairs, Maintenance and Engineering Works
- 2) Others

F. MARKET CHARACTERISTICS AND PRACTICES

1) Could you please describe the distribution channel?

2) Please specify your major customers by percentages and type of products/services targetted towards them.

3) What are the major promotional methods being used in this industry?

4) Do you know of any exhibition which will be held in Malaysia or the neighbouring countries for the next two years?

5) What would you consider as the main barriers to entry in this industry?

Government Restrictions : _____

Lack of Technical Know-How : _____

Brand Loyalty : _____

Keen Rivalry : _____

Others (please specify) : _____

6) What are the major opportunities you see in your industry over the next 5 years (promising trends, products, specialized products for specific industries, etc.).

7) Are you familiar with any Canadian companies or products?

8) What is your opinion of Canadian products and services?

9) How can suppliers successfully sell here? What are the competitive features of the existing representatives/distributors/manufacturers?

10) Are you interested in joint-venture opportunities with Canadian suppliers?

Dealership : _____

Manufacture/Assembly : _____

Others (please specify) : _____

END-USER SURVEY QUESTIONNAIRE ON THE AEROSPACE PRODUCTS
AND SERVICES INDUSTRY IN MALAYSIA

A. GENERAL

Name of Organisation : _____

Interview Date : _____

Address : _____

Business Contact Person : _____

Telephone/Telex : _____

Nature of Business : _____

Size of Organisation : _____

Ownership : _____

Name	Nationality	%
_____	_____	_____
_____	_____	_____
_____	_____	_____

Organisation Chart : _____

Functions of Major Departments

Present Aircraft Fleet/Number of Ground Control Systems Installed

Type	Number of Units	Brand/Country of Origin	Local Agent/Distributor/Manufacturer

B. PRODUCTS/SERVICES

For the products and services contained in the Appendix, please discuss the following points:

- 1) Demand - present and future
- 2) Major government projects/tenders:
 - Awarded over the last 5 years in terms of size, company, brand and country of origin of products
 - Future identified projects, estimated size, specifications, timing

DEMAND (OVER LAST 3 YEARS)

<u>Product/Services</u>	<u>Cost</u> <u>\$</u>	<u>Name of Agent/ Distributor/Manufacturer</u>	<u>Brand/Country of Origin</u>
-------------------------	--------------------------	--	------------------------------------

3) Areas of growth in the future, priority areas earmarked by Company/Government

4) Any conditions required to be fulfilled by company for preferential classification.

5) Who does the repairs, maintenance and engineering works for your company? Please state the extent of work done and the value of jobs.

6) Present and future areas of consultancy services required by the organization

<u>Nature of Consultancy</u>	<u>Name of Consulting Company</u>	<u>Country of Origin</u>	<u>Time & Length of Contact</u>
<hr/>	<hr/>	<hr/>	<hr/>
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7) How successful have Canadian products and services been in the past? Please state name of Canadian company, type of products and contract/s involved

8) What is your opinion of Canadian products and services and in which area could they be successful?

Source: Bank Negara Malaysia

9) How can suppliers successfully sell here? What are the competitive features of the representatives/distributors/manufacturers?

C. GOVERNMENT POLICIES AND REGULATIONS

1) Tender Procedures

2) Key personnel and departments for evaluating and awarding tenders

3) What are the applicable government regulations?

4) Are there any special incentives given to companies involved in the aerospace industry?

CURRENCY EXCHANGE RATES

The following exchange rates were used for currency conversions:

<u>Year</u>	<u>C\$</u>	<u>M\$</u>
1984	1	1.84
1985	1	1.84
1986	1	1.83
1987	1	1.95

Source: Bank Negara Malaysia

APPENDICES

3. GOVERNMENT POLICIES AND REGULATIONS

CURRENCY EXCHANGE RATES

1) Tender Procedures

The following exchange rates were used for currency conversions:

Year	RM	US
1987	1.93	1
1988	1.93	1
1989	1.84	1
1990	1.84	1
1991	1.84	1

2) Key personnel departments for evaluating and assessing tenders

Source: Bank Negara Malaysia

3) What are the applicable government regulations?

4) Are there any special incentives given to companies involved in the aerospace industry?

CIVIL AVIATION DEPARTMENT

The Civil Aviation Department is established within the Ministry of Transport. The objectives of the department are as follows:

1. To ensure that the needs of the peoples of Malaysia are met in terms of safe, regular, efficient and economical air transportation;
2. To minimise the potential for suffering, the loss of life and property, from air disaster and related causes;
3. To provide access to otherwise inaccessible areas in order to facilitate the development efforts of the government;
4. To provide opportunities in technical development and expertise;
5. To provide any other service relative to aeronautical transportation in furtherance of national goals;
6. To administer the Civil Aviation activities on a commercial basis so as to meet, as far as possible, the cost of opening, managing and providing the required facilities and services.

APPENDICES

The major activities carried out by the Department are listed below:

1. Air Transport and Legal Affairs
2. Air Traffic Service
3. Aeronautical Communication Operations
4. Airport Emergency Service (Fire and Rescue)
5. Aviation Security Service
6. Aeronautical Engineering and Navigational Aids
7. Flight Operations Service
8. Airport Development

These services are supported by the Management, Administration and Finance as well as Staff Training Units.

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These services are supported by the Management, Administration and Finance as well as Staff Training Units.

Some of the functions carried out by the Department are as follows:

Air Transport and Legal Affairs

This unit undertakes air transport planning studies for the purpose of determining policy and to act on applications for air transport licences and permits, conduct bilateral air transport negotiations, provide legal advice on air legislation and regulations and maintain liaison with international organisations, maintain statistical records and conduct analysis of statistics.

Aeronautical Engineering and Navigation Aids

This Unit provides technical and engineering data and criteria in support of Civil Aviation Fixed and Mobile communication and radio navigational aid programmes; to co-ordinate all routine and emergency maintenance policies and practices with the Telecoms Department for all aeronautical radio, computer and navigational system and to ensure effective operational utilisation of equipment, facilities and services; to monitor International Civil Aviation Organisation (ICAO) requirements relating to the engineering aspects of navigational aids.

Flight Operation Services

This Unit develops and prescribes requirements for the licensing of aircrew, certification of airworthiness of aircraft and conducts accident investigation and flight calibration of radio navigation aids, and provides governmental supervision of air carriers, private and flying club operations to ensure maintenance of adequate standards of safety in the aircraft engineering and operational fields.

Flight Calibration

The Department has 2 King Air 200T Aircraft fully equipped to carry out flight testing of radio navigational aids. The ground electronic calibration laboratory ensures a high calibration standard of navigational facilities as well as equipment in the calibration aircraft. A Cessna 206 and a BN2 aircraft are also used to inspect aerodromes in the rural areas, general aerial surveys and for aircraft accident investigation.

Aeronautical Communication Operations

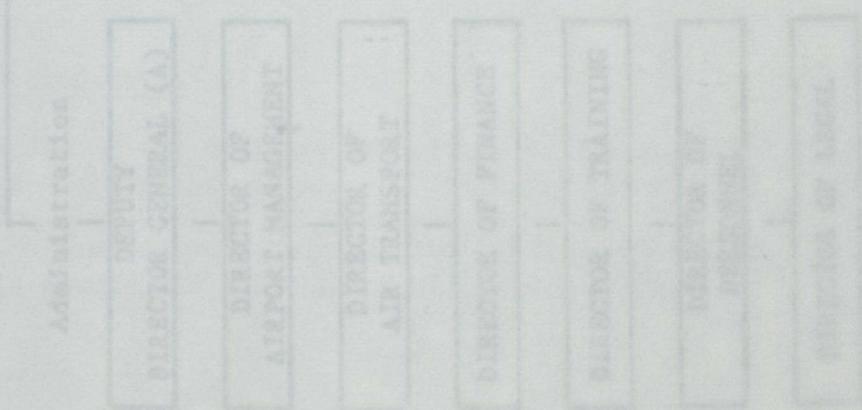
The responsibilities of this unit are to make available radio navigation aids for use by aircraft, to establish and maintain fixed and mobile communication services for communication between aircraft and ground units and to establish exchange of essential information between ground units (both domestic and international), and to provide required technical support for maintenance of navigational aids and aeronautical communications.

The services provided by this division include Aeronautical Mobile Services, Aeronautical Fixed Services and Aeronautical Radio Navigation Services.

Airport Emergency Service (Fire and Rescue)

This Unit prepares operational specifications for new fire and rescue vehicles and equipment, makes recommendations in regard to policy and specifies requirements in relation to the provision of both fixed and mobile fire fighting facilities and first aid and associated staff (in accordance with recognised standards and with regard to economy of operation), prepares standards from a fire engineering view point for plans and designs concerning building areas, hangers, buildings, water supply and fire protection services, and ensures that an adequate exchange of information is maintained between the Department and other organisations in Malaysia and throughout the world on all fire service matters.

The organisation structure of DCA is as shown below:



Aeronautical Communication Services and Navigation Services are provided to aircraft as follows:

The responsibilities of this unit are to make available radio navigation aids for use by aircraft, to establish and maintain fixed and mobile communication services for communication between aircraft and ground stations and to establish exchange of essential information between ground units through radio, visual, and other means.

Technical support for maintenance of navigational aids and equipment for aeronautical communications is provided by the unit. This support includes the maintenance of navigational aids, the maintenance of communication equipment, and the maintenance of communication facilities. The unit also provides technical support for the maintenance of communication facilities.

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Flight Calibration

The Department has 2 King Air E100 Aircraft fully equipped to carry out flight testing of radio navigation aids. This unit is equipped with a variety of electronic calibration laboratory equipment and a variety of electronic calibration facilities as well as a variety of electronic calibration facilities. A Cessna 441 is also used for flight testing of radio navigation aids. The unit also provides technical support for the maintenance of communication facilities.

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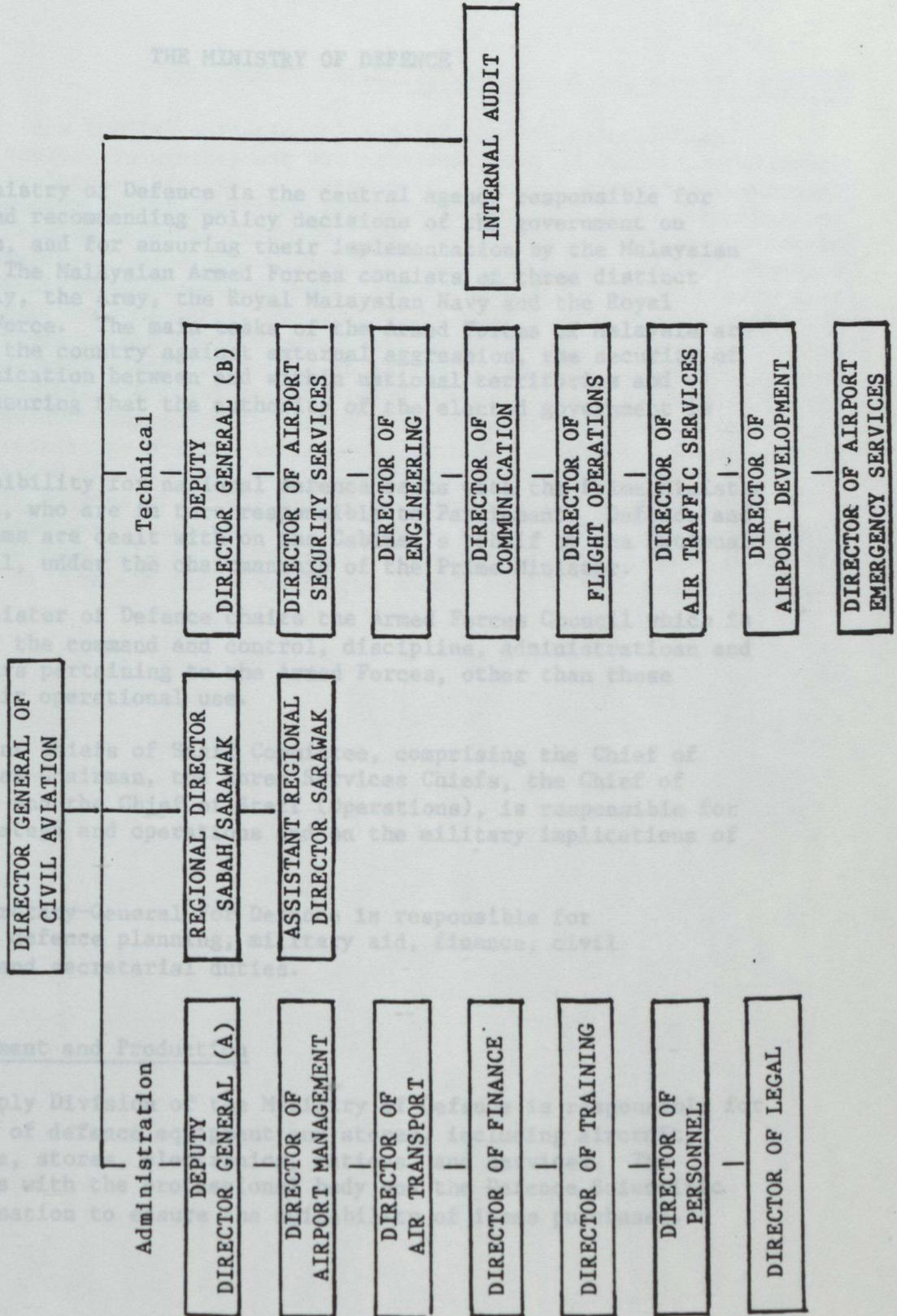
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ORGANISATION CHART OF THE DEPARTMENT OF
CIVIL AVIATION MALAYSIA



THE MINISTRY OF DEFENCE

The Ministry of Defence is the central agency responsible for formulating, and recommending policy decisions of the government on defence matters, and for ensuring their implementation by the Malaysian Armed Forces. The Malaysian Armed Forces consists of three distinct services, namely, the Army, the Royal Malaysian Navy and the Royal Malaysian Air Force. The main tasks of the Armed Forces of Malaysia are the defence of the country against external aggression, the security of lines of communication between and within national territories and assisting in ensuring that the authority of the elected government is maintained.

Responsibility for national defence rests with the Prime Minister and the Cabinet, who are in turn responsible to Parliament. Defence and security problems are dealt with on the Cabinet's behalf by the National Security Council, under the chairmanship of the Prime Minister.

The Minister of Defence chairs the Armed Forces Council which is responsible for the command and control, discipline, administration and all other matters pertaining to the Armed Forces, other than those relating to their operational use.

The Joint Chiefs of Staff Committee, comprising the Chief of Defence Forces as Chairman, the three Services Chiefs, the Chief of Logistics Staff and the Chief of Staff (Operations), is responsible for advising on strategy and operations and on the military implications of defence policy.

The Secretary-General for Defence is responsible for non-operational defence planning, military aid, finance, civil administration and secretarial duties.

Defence Procurement and Production

The Supply Division of the Ministry of Defence is responsible for the procurement of defence equipment and stores, including aircraft, ships, ordnance, stores, electronics, rations, and services. The Division liaises with the professional body and the Defence Scientific Research Organisation to ensure the suitability of items purchased.

Defence Science and Technology Centre

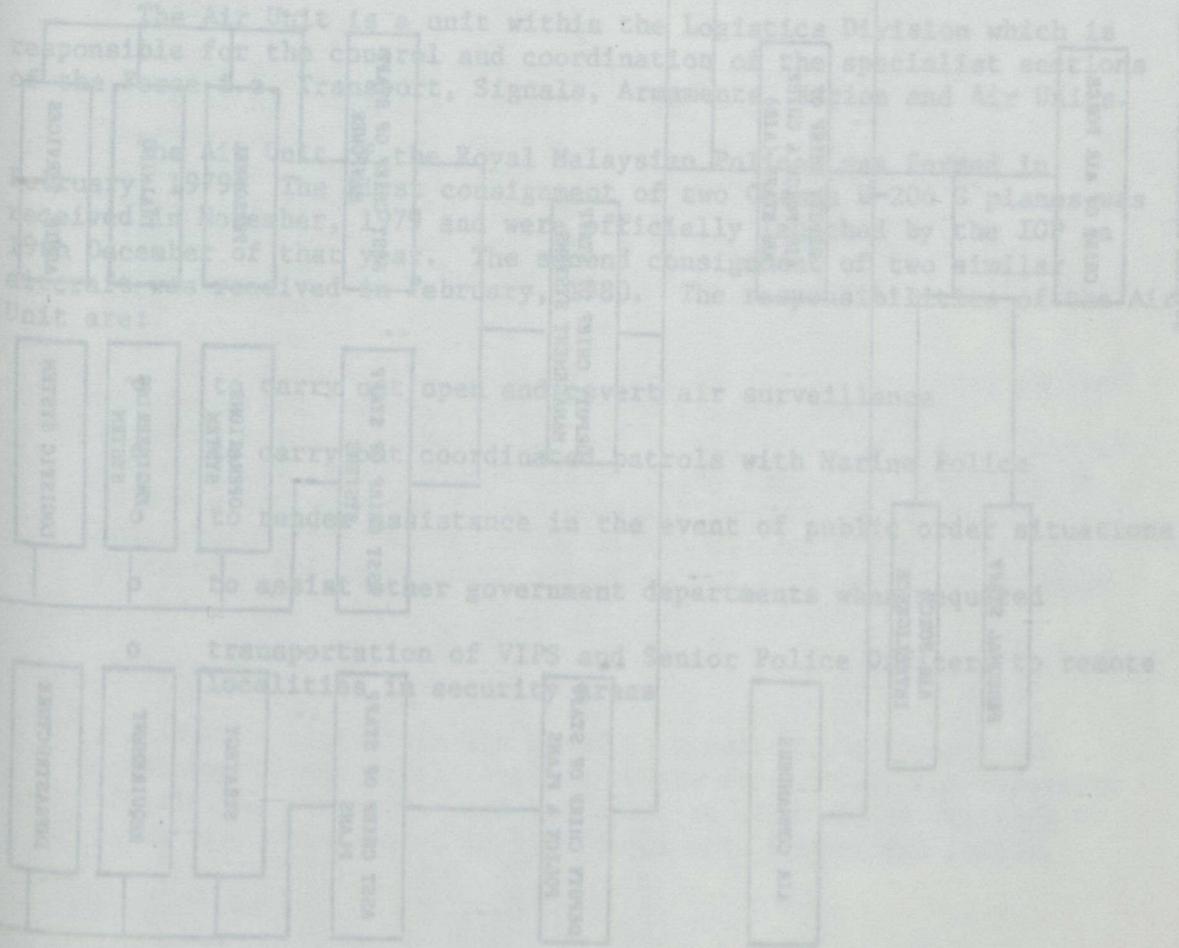
The Malaysian Defence Science Organisation (MIDSO) was established in 1968 to participate in the proceedings of various Commonwealth Defence Science conferences. Later, this organisation was renamed the Defence Science Coordinating Committee (DSCC) primarily to advise the Ministry of Defence on the promotion of scientific research in defence. The Defence Science and Technology Centre was established in that year with the assistance of the Canadian Defence Research Board. Its functions are, inter alia, to engage and assist in coordinating scientific study and research to meet defence needs and to study and develop techniques, materials and processes in support of design, specification, manufacturing and quality assurance. It also provide facilities for scientific measurements and to investigate problems arising in the provision, storage, and use of defence materials.

The Defence Science Training Centre (DSTC) is equipped with laboratory testing facilities to support research and development work and operational research studies. The laboratories also provide support for quality assurance of equipment purchased by the Ministry of Defence.

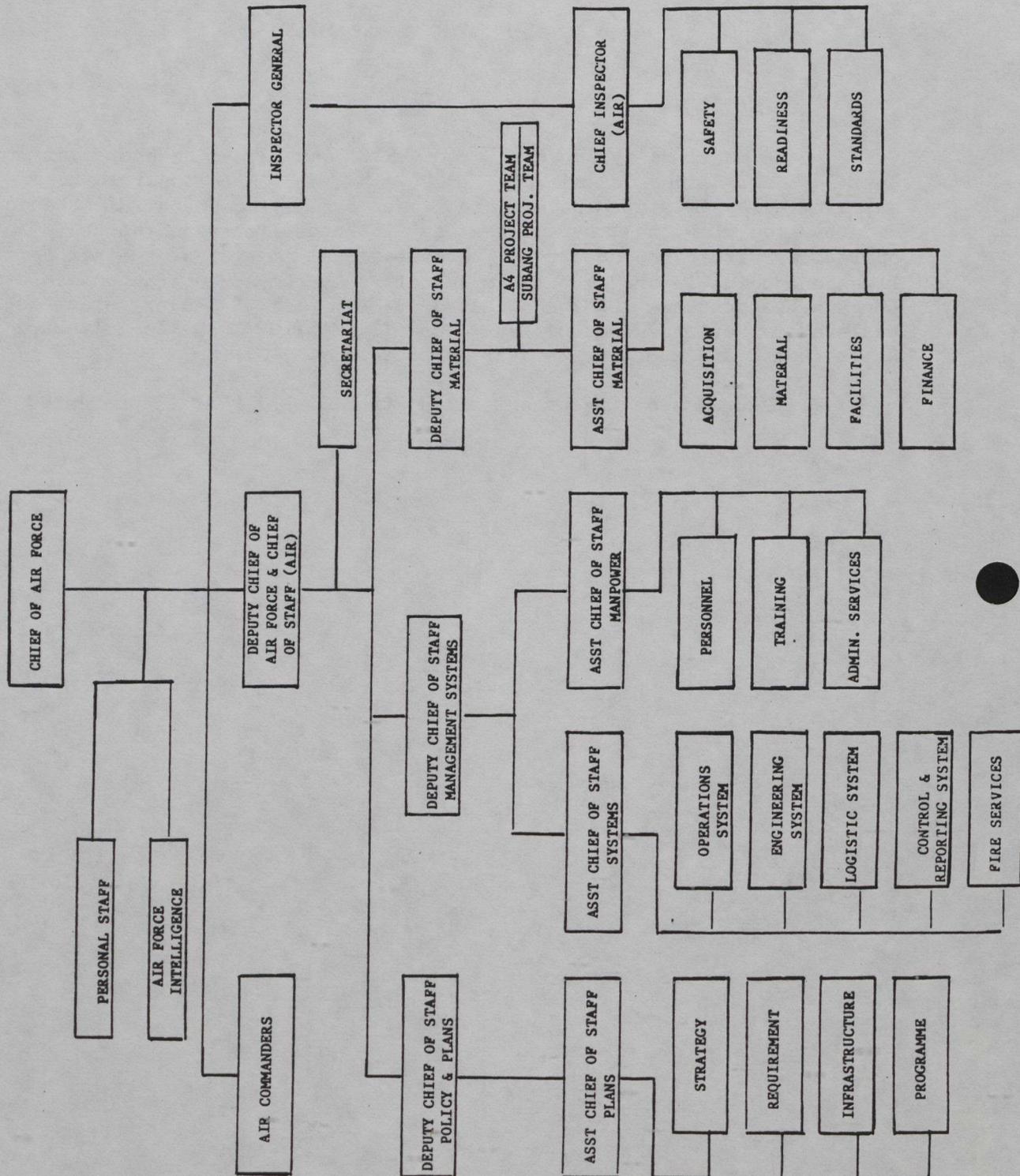
ROYAL MALAYSIAN AIR FORCE

The Royal Malaysian Air Force (RMAF) was formed at the Royal Air Base in Kuala Lumpur on 2nd June, 1958. The RMAF is responsible for guarding Malaysia's air space against any hostile intention. It stands side by side with the Army and the Navy in the military and security operations within the country. The operational control of the Air Force bases and units in the country is exercised by the Air Operational Command Headquarters (MABES) situated at Shah Alam, Selangor, which is assisted by Regional Headquarters I and II (MAWILUD I and II) situated in Kuala Lumpur and Kuching, Sarawak respectively.

An outline of the organisation structure of RMAF is presented below:



OUTLINE ORGANISATION OF RMAP



ROYAL MALAYSIAN POLICE FORCE

The Royal Malaysian Police Force is under the command of the Inspector-General of Police (IGP), who is responsible to the Minister of Home Affairs for the control and direction of the Force. The Headquarters of the Royal Malaysian Police is made up of four departments - Special Branch, Management Department, Criminal Investigation Department and Internal Security and Public Order.

The functions of the Management Department relate to equipping, staffing and general administration and efficiency of the Force. It has four main divisions, namely, Administration, Service/Personnel, Training and Logistics while the ancillary divisions are the Public Relations Division and the Computer Division.

The Air Unit is a unit within the Logistics Division which is responsible for the control and coordination of the specialist sections of the Force i.e. Transport, Signals, Armaments, Marine and Air Units.

The Air Unit of the Royal Malaysian Police, was formed in February, 1979. The first consignment of two Cessna U-206 G planes was received in November, 1979 and were officially launched by the IGP on 19th December of that year. The second consignment of two similar aircraft was received in February, 1980. The responsibilities of the Air Unit are:

- o to carry out open and covert air surveillance
- o to carry out coordinated patrols with Marine Police
- o to render assistance in the event of public order situations
- o to assist other government departments when required
- o transportation of VIPs and Senior Police Officers to remote localities in security areas

Industrial Promotion Division

MIDA undertakes to encourage investment in Malaysia through the planning and implementation of strategies to promote domestic and foreign investment, attending to investment enquiries, briefing foreign and local investors, and preparing and publishing promotional brochures, booklets and information pamphlets to senior executives of leading manufacturing firms throughout the world. Advertisements and special write-ups on various aspects of the country's economy are placed in leading foreign financial newspapers and journals.

Development Divisions

There are five Divisions categorised according to specific industry groups. These Divisions are: Resource-based Industries Division, Engineering Industries Division, Electrical and Electronics Industries Division, Food Beverage and Chemical Industries and Building Materials, Textiles and Miscellaneous Industries Divisions.

The Functions of these Divisions are:

1. To identify industrial opportunities and undertake industrial studies.
2. To evaluate applications for setting up industrial projects.
3. To provide assistance in the implementation of approved projects.

While MIDA does not maintain an office at present in Canada, assistance and information regarding opportunities in Malaysia can be obtained from the Malaysian Trade Commission resident in Toronto at the address below:

Encik Md. Nor bin Md. Said
Trade Commissioner
Consulate of Malaysia (Trade)
34 King Street East
Suite 1201 Fidelity Building
Toronto, Ontario
Canada M5C 1E5

Telex : 06-217825 DAGANG TOR
Telephone: (416) 869-3886
Cable : MALAWAKIL OTTAWA

OTHER GOVERNMENT ORGANISATIONS
AND ASSOCIATIONS

A. MALAYSIA INDUSTRIAL DEVELOPMENT AUTHORITY (MIDA)

The Malaysian Industrial Development Authority (MIDA), is the principal agency for the promotion and coordination of all industrial development activities (i.e. joint venture investments, technology transfers, etc.) in Malaysia.

MIDA activities are directed both within Malaysia and abroad. With its headquarters in Kuala Lumpur, MIDA has eight regional offices throughout Malaysia and 15 overseas centres located in New York, Chicago, Los Angeles, Sydney, Panama, London, Paris, Cologne, Berne, Hong Kong, Tokyo, Osaka, Seoul and Singapore.

One of the principal functions of MIDA is to advise the Minister of Trade and Industry on the formulation and implementation of various industrial development policies and strategies, including incentives for industry and other facilities required to accelerate industrial development. It also offers advice and assistance to State Governments and regional development bodies involved with industrial development within Malaysia.

MIDA handles all enquiries from potential investors in the manufacturing sector. It plays the role of adviser to entrepreneurs, both Malaysian and foreign, on the feasibility of and technicalities involved in locating industrial projects in Malaysia and provides follow up assistance where necessary. Applications for manufacturing licences, incentives, tariff protection and import duty exemption are also evaluated by MIDA.

Activities

MIDA's activities are aimed at accelerating industrial development, the establishment of new industries, the expansion of existing industries and the solution of problems relating to industrial development in accordance with Government policy.

B. MALAYSIAN INDUSTRIAL DEVELOPMENT FINANCE BERHAD (MIDF)

The Malaysian Industrial Development Finance Bhd. was originally established as a private institution in 1960 and reorganised in 1963 as a public enterprise, with the participation of the Malaysian Government and the World Bank.

The objective of MIDF is to promote the progress and development of industries in Malaysia by providing capital, industrial sites and advisory services.

MIDF is divided into the following divisions:

1. Project Division - evaluates and appraises applications for loans and disbursement of approved loans.
2. Loans Supervision, Research and Advisory Services Division - carries out research and planning relating to the company's business in general, researches projects and provides advisory services to the management and clients, and supervises loans.
3. Securities Marketing Division - supervises the share business of the company and provides related services to clients in the sale, underwriting and issuing of shares and acts as registrar to client companies.
4. Bumiputra Development Division - endeavours to increase the company's assistance to bumiputra through loans, equity participation and advisory services.
5. Branch Division - coordinates the activities of the company's branches.
6. Business Development Division - endeavours to develop the business of the company.

The principal activities of MIDF are,

- o to assist in organising, expanding or modernising the activities and new industries;
- o to promote and develop the investment industries in the private sector; and
- o to promote and develop investment in the private sector.

MIDF provides the following services:

- (a) medium and long-term loans;
- (b) loans for the purchase of plants;
- (c) loans for the purchase of machinery and equipment;
- (d) facilities in the issuing of shares; and
- (e) equity participation and underwriting of shares.

C. STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA

The Standards and Industrial Research Institute of Malaysia (SIRIM) is an organisation roughly equivalent to the Canadian Standards Association and its functions include:

1. Promoting and undertaking industrial research.
2. Providing industries with assistance towards industrial efficiency and development.
3. Assisting the development of domestic levels of technology by encouraging the improvement of production, manufacturing and technology processes.
4. Encouraging and undertaking educational work and training of research and industrial personnel to strengthen Malaysian industry.
5. Establishing and promoting of Malaysian Standards and quality of products and processes.
6. Providing technical and scientific backup services for testing, investigation and research.
7. Providing scientific and technological advice to industry, the public and government, and generally to promote and encourage public and industrial welfare, health, safety and consumer protection.
8. Providing information and industrial liaison services.
9. Collaborating in the preparation and dissemination of useful technical information for industry, government and the public in general.

A 24-member Council oversees the management of the Institute. To assist the Council in implementing its policies, a Standards Committee, Executive Committee and the Research Committee have been established.

SIRIM's activities also focus on responding to the needs of local industry by developing and transferring new technologies and providing technical support where required.

The Institute's programs, covering 12 technical activity areas, are as follows:

1. Industrial Research
 - (a) Research and Development
 - (b) Engineering Testing
 - (c) Scientific Testing
 - (d) Industrial Design and Fabrication

2. Standards and Standardisation
 - (a) Standards Development
 - (b) Standards Promotion and Implementation
 - (c) Quality Assurance and Certification
 - (d) Metrology

3. Industrial Consultancy Services
 - (a) Industrial Extension
 - (b) Industrial Liaison
 - (c) Technical Information
 - (d) Technical Publications

SIRIM provides specialised assistance in the development of technology in the metal working industries in Malaysia through the Metal Industry Technology Centre (MITEC) and Metal Industry Research and Development Centre (MIRDC).

Of particular significance is the Patent and Information Documentation Centre (PIDC) which was set up in May 1984 to acquire certain "state-of-the art" technologies and to identify copyright of devices that have not been patented in Malaysia.

PIDC maintains a registry of 1.6 million patent documents obtained from all over the world.

D. FEDERATION OF MALAYSIAN MANUFACTURERS

The Federation of Malaysian Manufacturers (FMM) equivalent to the Canadian Manufacturers Association (CMA), was formed in 1968 to protect and promote the interests of manufacturers and to assist the government in carrying out its policy of industrial development. The FMM is a self-financing non-profit making body with a membership of over 700 companies representing local, foreign and joint venture manufacturing operations.

The FMM can assist foreign companies looking for a local partner by identifying, from the list of members, potential candidates with both the intent and financial capability to enter into such an association.

Correspondence with the FMM should be addresses to:

Mr. Tan Keok Yin
Executive Director
Federation of Malaysian Manufacturers
17th Floor, Wisma Sime Darby
P.O. Box 12194
50770 Kuala Lumpur
Telephone: 03-2931244

E. TRADE ASSOCIATIONS

Several trade and manufacturing associations exist in Malaysia. They range from ethnic-based associations to those which are more international in scope. Canadian manufacturers intending to move into joint-venture arrangements with Malaysian companies may contact these associations for assistance and more information.

These associations primarily serve the following broad functions:

- o promote, preserve and protect the interests of companies in the industry and to assist in industrial and trade development.
- o to act as a spokesman for a particular group/sector in its dealings with the government/private sector bodies.
- o to provide a focal point for companies to meet, discuss and solve problems.
- o to obtain and disseminate relevant information to its members.
- o to organize trade fairs at home and abroad and to undertake other activities beneficial to members.

The major associations are:

National Chamber of Commerce & Industry of Malaysia

The National Chamber of Commerce & Industry of Malaysia (NCCIM) is an apex organisation comprising the five principal private sector bodies concerned with commerce and industry, which in turn represent the business interests of the Malay, Chinese and Indian communities, the international investors and the Malaysian manufacturers. The NCCIM presently consists of the following constituent members:

- (1) The Malay Chamber of Commerce and Industry of Malaysia (MCCIM)
- (2) The Associated Chinese Chambers of Commerce & Industry of Malaysia (ACCCIM)

- (3) The Associated Indian Chambers of Commerce & Industry of Malaysia (AICCIM)
- (4) Malaysian International Chamber of Commerce & Industry (MICCI)
- (5) Federation of Malaysian Manufacturers (FMM)

The general objective of the NCCIM is to promote, foster and protect the interests of all corporations and persons carrying on commerce and industry in Malaysia and to facilitate the trade and investment activities of its members.

In discharging its responsibilities, the Chamber considers close rapport and liaison with government and its agencies of paramount importance and maintains continuous consultation on a wide range of subjects covering business and economic development. Of special importance are new policies and initiatives of the government and other related institutions such as those dealing with privatisation, Look East, and Malaysia Incorporated.

NCCIM also collaborates with its ASEAN counterparts and other similar international organisations. It is a member of the ASEAN Chamber of Commerce and Industry as well as being associated with the Paris based International Chamber of Commerce. NCCIM is also responsible for coordinating Malaysia's participation in the activities of the recently formed Asean Canada Business Council

Correspondence should be addressed to:

Encik Wan Yusoff Wan Ismail
Executive Director
National Chamber of Commerce & Industry of Malaysia
17th Floor Plaza Pekeliling
Tower Block
Jalan Tun Razak
50400 Kuala Lumpur
Telephone: 03-4429873

Malaysian International Chamber of Commerce and Industry

The Malaysian International Chamber of Commerce and Industry (MICCI) is a voluntary non-profit association representing mainly transnational corporations participating in joint-ventures or other forms of business in Malaysia, and a number of Malaysian companies with substantial overseas interests or which provide services in international business.

The Chamber's membership represent of a wide spectrum of businesses. Its 400 members from 24 different countries and numerous subsidiaries and associates are estimated to represent about 80 percent of total foreign investment in Malaysia, excluding primary industries.

All corporations are free to consult or correspond with the Chamber whether or not they are members. Potential investors from overseas are particularly welcome and the Chamber arranges briefing sessions for them in the interests of promotion of investment and development of international trade.

For further information contact:

Mr. P.J.L. Jenkins
Executive Director
Malaysian International Chamber of Commerce and Industry
8th Floor, Wisma Damansara
Jalan Semantan
P.O. Box 192
50490 Kuala Lumpur
Telephone: 03-2542117

ASEAN Chamber of Commerce and Industry

The ASEAN (Association of South East Asian Nation) Chamber of Commerce and Industry (ASEAN-CCI) is an association comprising the national chambers of commerce from each ASEAN member country. It was formed primarily to accelerate and facilitate trade and industrial development among and between member countries; promote cooperation and coordination in private business sectors and to foster closer relations and cooperation among member countries.

The address of the Asean-CCI is:

ASEAN Chamber of Commerce
17th Floor Plaza Pekeliling
Tower Block
Jalan Tun Razak
50400 Kuala Lumpur
Telephone: 03-4429871/4429873

In addition to the above organisations there are three ethnic-based chambers of commerce:

The Malay Chamber of Commerce and Industry of Malaysia
17th Floor Plaza Pekeliling
Tower Block
Jalan Tun Razak
50400 Kuala Lumpur
Telephone: 03-2928522

The Associated Chinese Chambers of Commerce and
Industry of Malaysia
Ground Floor, Chinese Assembly Hall
1 Jalan Maharajalela
50150 Kuala Lumpur
Telephone: 03-2380278/2380473

The Associated Indian Chamber of Commerce and
Industry of Malaysia
c/o United Oriental Assurance Sdn. Bhd.
36 Jalan Ampang
50450 Kuala Lumpur
Telephone: 03-2302844/2387917

CONTACT DETAILS OF RELEVANT GOVERNMENT AGENCIES

A. Ministry of Defence (MINDEF)
Jalan Padang Tembak
50634 Kuala Lumpur

Tel: 03-2921333

Contact Persons

Responsibility

Deputy Secretary General,
Materials Management and Research:
Datuk Hj. Mohd. Amir Hj. Yaakub

Overall in charge of tender evaluation

Secretary, Supply Division
Mr. Yussof Salleh

Purchase requisitions

Under Secretary, Defence
Production:
Mr. Zainal Abidin Hj. Ahmad

Development of local manufacturing facilities
to produce items for MINDEF

B. Department of Civil Aviation
(Jabatan Penerbangan Awam)
Terminal 2
Kuala Lumpur International Airport
47200 Subang

Tel: 03-7461844

Contact Persons

Responsibility

Director-General:
Mr. Zolkipli Abdul

Overall planning and policy decisions,
evaluation of tenders

Director of Aeronautical
Communications:
Mr. Omar Bustamam

Evaluation of nav aids; replacement and
upgrading of existing equipment

Director of Air Traffic Services:
Mr. Noordin Saad

Provision of air traffic services; evaluation
control tower equipment

Director of Airport Development:
Mr. Chan See Lan

Planning and development of airports

Director of Flight Operations:
Capt. Abdul Shukor Abdul Aziz

Evaluation of all matters pertaining to
policies and everyday running of flight
operations in the country

- C. Royal Malaysian Police
Lapangan Terbang Antarabangsa Subang
47200 Selangor

Tel: 03-7464294

Contact Person:

Mr. Mohd. Noor Jaman
- Head of the Poice Air Unit

- D. Syarikat Telekom Malaysia Bhd.
Bangunan Bukota
Jalan Pantai Baru
59200 Kuala Lumpur

Tel: 03-2329494

Contact Person:

Mr. Tan Po Keat
- Director, Technical Division

- E. Malaysian Industrial Development Authority
Floor 3-6, Wisma Damansara
Damansara Heights
Jalan Semantan
50490 Kuala Lumpur

Tel: 03-2543633

Contact Persons

Director of Industrial Promotion
Division

Mr. J. Jegathesan

Industrial Promotion Division
(responsible for the U.S.
and Canada disks)

En. Sulaiman Rahman/
Mr. Lim Hock Guan

Canadian Investments Advisor
Mr. Robert Mcleod

PROFILES OF MAJOR SUPPLIERS AND
MANUFACTURERS INTERVIEWED

A. MANUFACTURER

1. NAME OF COMPANY : AIROD SDN. BHD.

ADDRESS : Locked Bag 4004
Pejabat Pos Kampung Tunku
47309 Petaling Jaya

TELEPHONE : 03-7465112

TELEX : MA 37910

CONTACT PERSON : Brig. Jen. Dato Ariff Bin Dato Awang - General
Manager

NUMBER OF EMPLOYEES : About 250

PAID-UP CAPITAL : C\$3 million

PRINCIPAL SHAREHOLDERS: Name of Shareholder Percent of Shareholding

Lockheed Aircraft Services International	49%
Aerospace Industries Malaysia (AIM) (the shareholders of AIM are the Government of Malaysia, MAS and United Motor Works each holding 33 1/3%)	51%

NATURE OF BUSINESS :

- o Provides medium and high technology services for aircraft, engines, components, accessories and avionics
- o Assembles components for digital flight recorder
- o Acts as agents to locally represents defence and other high technology products

EXPRESSED INTEREST : Joint venture to provide maintenance and overhaul services for civil aviation in the Asia Pacific region

2. NAME OF COMPANY : SYARIKAT DUNLOP AVIATION SDN. BHD.

ADDRESS : 4 Jalan Tandang
46700 Petaling Jaya

TELEPHONE : 03-7918833

TELEX : MA 37589

CONTACT PERSON : En. Abdul Shukor Nagor - Managing Director of Dunlop
Malaysian Industries Bhd.

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL OF THE HOLDING COMPANY : C\$75,000

PRINCIPAL SHAREHOLDER: Wholly owned subsidiary of Dunlop Malaysian
Industries Bhd.

PRINCIPAL SHAREHOLDERS:

<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
Consolidated Plantations Bhd.	51.040%
Lembaga Urusan dan Tabung Haji	3.862%
Syarikat Permodalan Kebangsaan Bhd.	2.905%
Others	42.193%

OF HOLDING COMPANY

NATURE BUSINESS : Manufacture and marketing of aviation tires

EXPRESSED INTEREST : None

B. LOCAL OFFICE OF FOREIGN MANUFACTURERS/AGENCIES

1. NAME OF COMPANY : HAWKER PACIFIC (M) SDN. BHD.

ADDRESS : Lot 25, Lower Ground Floor
Hotel Equatorial
Jalan Sultan Ismail
50250 Kuala Lumpur

TELEPHONE : 03-2619134

TELEX : EQATOR MA 30263

CONTACT PERSON : Mr. Yusoff Ahmad Yang - Manager

NUMBER OF EMPLOYEES : 6

PAID-UP CAPITAL : Not Available

PRINCIPAL SHAREHOLDERS: Foreign 49% - Hawker Siddeley Group
Malaysian 51%

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>
Allison	U.S.A.	250 series engines
Lycoming	U.S.A.	T53 engines
Beech	U.S.A.	Aircraft
Nomad	U.S.A.	Aircraft
Bendix	U.S.A.	Avionics and spares
Pratt and Whitney Canada	Canada	Engine and spares
Litton Aerospace Products	U.S.A.	Navigational systems

NATURE OF BUSINESS : Hawker Pacific is an international trading company with its head office in Australia and offices in the Asian and Pacific regions. It is a subsidiary of the Hawker Siddeley Group. It engages in the transfer of high technology equipment such as aviation equipment and skills throughout the region. It is also acts as agent in Malaysia for several foreign companies supplying the aerospace industry.

EXPRESSED INTEREST : None

2. NAME OF COMPANY : ROCKWELL-ELECTRONICS (AUSTRALASIA) PTY. LTD.

ADDRESS : 14th Floor Wisma Stephens
Jalan Raja Chulan
50200 Kuala Lumpur

TELEPHONE : 03-2482251 / 2482812

CONTACT PERSON : Mr. Ko Yook Tang - Manager

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : Not Available

NATURE OF BUSINESS : Representative office of Rockwell-Collins
International Corporation, U.S.A. dealing with a
whole range of avionics

EXPRESSED INTEREST : None

3. NAME OF COMPANY : PERUSAHAAN GEC SDN. BHD.

ADDRESS : Wisma G.E.C.
Jalan 215-Templer
46050 Petaling Jaya

TELEPHONE : 03-7911388

TELEX : 37617

CONTACT PERSON : Mr. K. C. Foo - General Manager
En. Mazran bin Ahmad - Deputy General Manager
Mr. Lau Ten Chai - Technical Services Executive,
Defence and Scientific Department

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : Not Available

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholder</u>
	Lembaga Urusan dan Tabung Haji	46%
	GEC PLC, United Kingdom	30%
	Bank Islam Malaysia	5%
	Private Shareholders	19%

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
GEC	United Kingdom	Electrical equipment and avionics

EXPRESSED INTEREST : Distribution of aircraft supplies and accessories,
and engines and engine components

4. NAME OF COMPANY : ALSO AZBI (M) SDN. BHD

ADDRESS : 16th Floor, Box 16-B
Bangunan Arab-Malaysian
55 Jalan Raja Chulan
50200 Kuala Lumpur

TELEPHONE : 03-2321334

TELEX : MA 20233 AZITRA

CONTACT PERSON : Mr. Hj. Alang Zari Ishak - Managing Director

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : C\$125,000

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
	AZBI Holdings (M) Sdn. Bhd.	49%
	IBCOL Technical Services	49%
	Private	2%

NATURE OF BUSINESS : Subsidiary of IBCOL Group of Companies, Germany, dealing with aviation products, defence equipment, aviation and defence related services, and engineering services

EXPRESSED INTEREST : Product lines not conflicting with existing ones

C. LOCAL AGENTS

1. NAME OF COMPANY : BAKTI UDARA SDN. BHD.

ADDRESS : Lot 4881 Jalan SS 13/2
Subang Jaya
47500 Petaling Jaya

TELEPHONE : 03-7344008 / 7344014

TELEX : MA 36556 UDARA

CONTACT PERSON : Mr. Harbhajan Singh - Managing Director

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : C\$460,000

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
	Rauna Sdn. Bhd.	99%
	Private Individual	1%

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>
Pilatus	Switzerland	Aircraft
Lockheed	U.S.A.	Aircraft
General Electric	U.S.A.	Engines and spares
Honeywell	U.S.A.	Ammunitions
Raytheon*	Canada	Air Traffic Control

* Bakti Udara was Raytheon representative in the past. However, at present there exists only a loose association with no formal agency agreement

EXPRESSED INTEREST : Interested in products such as aircraft, specialised weapons and aircraft bombs

2. NAME OF COMPANY : MECOMB MALAYSIA SDN. BHD.

ADDRESS : No. 20 Jalan 225
46100 Petaling Jaya

TELEPHONE : 03-7743422

TELEX : MA 37764

CONTACT PERSON : Ms. M. F. Ma - Sales Manager, Electronics and
Scientific Division

NUMBER OF EMPLOYEES : About 100

PAID-UP CAPITAL : Not Available

PRINCIPAL SHAREHOLDERS: Wholly owned subsidiary of Sime Darby

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>	<u>Brand</u>
John Fluke Mfg. Co., Inc.	U.S.A.	Test, measurement and control instrumentation	Fluke
Tektronix, Inc.	U.S.A.	Oscilloscopes	Tektronix

NATURE OF BUSINESS : Mainly instrumentation and engineering specialist in
the areas such as Electronics and Scientific,
Controls Instrumentation, Industrial Products and
Mechanical Engineering

EXPRESSED INTEREST : Interested in test equipment not conflicting with
existing product lines

3. NAME OF COMPANY : UNIREP ENTERPRISE SDN. BHD.

ADDRESS : 17 Jalan Setiapuspa
Medan Damansara
50490 Kuala Lumpur

TELEPHONE : 03-2554792

TELEX : MA 31328 MALIN

CONTACT PERSON : Mr. James Thoo - Director

NUMBER OF EMPLOYEES : 8

PAID-UP CAPITAL : C\$27,700

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>
Northrop	U.S.A.	Aircraft
General Electric	U.S.A.	Commercial engines and spares
Racal	U.S.A.	Avionics and electronic support measure equipment
North-West International	U.S.A.	Aircraft Division - spares only
Med Engineering Systems	Canada	Bomb disposal helmets
Safeco Manufacturing	Canada	Bomb disposal Suits
Pedsco Canada Ltd.	Canada	Safety equipment for remote handling of explosive devices
Proparms	Canada	Safety equipment for remote handling of explosive devices

EXPRESSED INTEREST : None

4. NAME OF COMPANY : GUA MUSANG SDN. BHD.

ADDRESS : 111 Jalan SS 15/5A
47500 Subang Jaya

TELEPHONE : 03-7336570

CONTACT PERSON : Tengku Safiyuddin - Director

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : Not Available

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>
Britol Aerospace	Canada	Aviation weapon system
Beech	U.S.A.	Aircraft
Canadian Astronautics Ltd.	Canada	Remote sensing equipment and radar system
Bendix Avelex	Canada	Various defence products
Litton	U.S.A.	Navigational system
Bendix	U.S.A.	Avionics

EXPRESSED INTEREST : None

5. NAME OF COMPANY : SUMBER TEKNIK SDN. BHD.

ADDRESS : 26 Lorong Jelutong
Southern Park
41200 Klang

TELEPHONE : 03-3312214

CONTACT PERSON : En. Abdul Latif - Managing Director

NUMBER OF EMPLOYEES : Not Available

PAID-up CAPITAL : Not Available

ANNUAL TURNOVER : About C\$200,000

AGENCIES HELD :

<u>Manufacturer</u>	<u>Country</u>	<u>Product Lines</u>
Audor Communications Inc.	Canada	Air Traffic Control

EXPRESSED INTEREST : None

6. NAME OF COMPANY : ANTAH AVIATION SALES SDN. BHD.

ADDRESS : 7th Floor Bangunan BNH
Off Jalan Semantan
Damansara Heights
50490 Kuala Lumpur

TELEPHONE : 03-2545144

TELEX : MA 30498 ANTAH

CONTACT PERSON : Mr. Zakaria Md. Shah - General Manager

NUMBER OF EMPLOYEES : 3

PAID-UP CAPITAL : Not Available

PRINCIPAL SHAREHOLDERS : Wholly owned subsidiary of Antah Holdings Bhd.

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
General Electric	U.S.A.	Civil aircraft engines
Smiths Industries	United Kingdom	Avionics
Westland	United Kingdom	Helicopters

EXPRESSED INTEREST : Dealership for C.A.E. flight simulators

7. NAME OF COMPANY : M & Z HOLDINGS SDN. BHD.

ADDRESS : No. 68-C Jalan Kampung Attap
50460 Kuala Lumpur

TELEPHONE : 03-2745155

TELEX : MZ HOLD MA 31425

CONTACT PERSON : Major (Rtd.) Mohd. Azidin Hj. Osman
- General Manager

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : C\$100,000 (to be increased to C\$250,000)

AGENCIES HELD :

<u>Trading Houses</u>	<u>Origin</u>	<u>Product Lines</u>
Dowty Group PLC	United Kingdom	Aircraft spares
Australian Defence Production	Australia	Ammunition

EXPRESSED INTEREST : Distribution of products such as helicopters, spare parts, rocket, range of aircraft guns and ammunition

8. NAME OF COMPANY : MATAD SDN. BHD.

ADDRESS : Box #4 Wisma Selangor Dredging
9th Floor South Block
142A Jalan Ampang
50450 Kuala Lumpur

TELEPHONE : 03-2613673

TELEX : AZLAN MA 30011

CONTACT PERSON : Major (Air) Rtd. Lim Ming Moi - Technical Manager

NUMBER OF EMPLOYEES : 12

PAID-UP CAPITAL : Not Available

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
Grumman	U.S.A.	Aircraft
Bell	U.S.A.	Helicopter
Gulfstream Aviation	U.S.A.	VIP Jets
Aeromacchi	Italy	Aircraft
Fokker	Netherlands	Aircraft
Rockwell-Collins*	U.S.A	Avionics

* Dealer for the Rockwell-Collins representative office in Malaysia, Rockwell-Electronics (Australasia) Pty. Ltd.

EXPRESSED INTEREST : Dealership in products not conflicting with present ones held

9. NAME OF COMPANY : SYARIKAT AGENSI MAJU RIA SDN. BHD.

ADDRESS : 6th Floor, MUI Plaza
Jalan P. Ramlee
50250 Kuala Lumpur

TELEPHONE : 03-2415722

TELEX : MR MA 30536

CONTACT PERSON : Mr. Malcom William Alvisse - General Manager

NUMBER OF EMPLOYEES : 14

PAID-UP CAPITAL : Not Available

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
Singerlink-Miles	United Kingdom	Flight simulator
Ferranti International Plc.	United Kingdom	Tactical simulator
Britten-Norman	United Kingdom	Early warning aircraft

EXPRESSED INTEREST : Dealership in products not conflicting with present ones held

10. NAME OF COMPANY : JAUHARI ENTERPRISES SDN. BHD.

ADDRESS : Tingkat 31, Menara Tun Razak
 Jalan Raja Laut
 50350 Kuala Lumpur

TELEPHONE : 03-2935325

TELEX : PELARA MA 31687

CONTACT PERSON : Raja Mahmudin R. Baharuddin - Manager, Marketing
 Mr. Francis Chong Yoong Tet - Manager, Engineering

ANNUAL TURNOVER : C\$1.5 million to C\$2.5 million

NUMBER OF EMPLOYEES : Not Available

PAID-UP CAPITAL : Not Available

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
Ultramare	U.S.A.	Ground support equipment Safety survival equipment Engine and airborne parts Fuel control unit spares
Spar Aerospace	Canada	Technical services for aircraft overhaul and aircraft spares
Indal Technologies	Canada	Shipboard helicopter facilities

EXPRESSED INTEREST : Dealership in products not conflicting with present ones held

11. NAME OF COMPANY : SIME DARBY BERHAD

ADDRESS : 21st Floor, Wisma Sime Darby
Jalan Raja Laut
50350 Kuala Lumpur

TELEPHONE : 03-2914122

TELEX : SDMAL MA 30038

CONTACT PERSON : En. Din Merican - Regional Director, Malaysia Region

NUMBER OF EMPLOYEES : 2

PAID-UP CAPITAL : Not Available

AGENCIES HELD :

<u>Manufacturer</u>	<u>Origin</u>	<u>Product Lines</u>
de Havilland	Canada	Aircraft

EXPRESSED INTEREST : None

5. **Bahagia Teknik Sdn. Bhd.** Satellite-based system CAL, Canada
Suite 11.02, 11th Floor
Wisma SPK
Jalan Sultan Ismail
50250 Kuala Lumpur

Tel: 03-2482244

Contact Person:
En. A. Fizal Othman
- Managing Director
6. **Aviation Services (M) Sdn. Bhd.*** Alouette aircraft Aerospatiale, France
Jalan Lapangan Terbang Lama
50460 Kuala Lumpur

Tel: 03-2412371

Contact Person:
Mjr. Zainuddin

*Company refused to grant an interview
7. **Sofweeman Sdn. Bhd.** Ammunition and armed Sibmas, Belgium
15C, 15th Floor, Office Tower vehicles for land British Marconi
Kompleks Nagaria forces and navy GE, U.S.A.
Jalan Imbi
55100 Kuala Lumpur

Tel: 03-2421511

Contact Person:
En. Mohd. Sari Bin Samek
- Sales Executive
8. **Raynors Malaysia Sdn. Bhd.** Aircraft and aircraft Canadair, Canada
G.P.O. Box 11389 parts
50744 Kuala Lumpur

Tel: 03-2919955

Contact Person:
Tunku Shahabuddin bin Tunku Besar
Burhanuddin
- Chairman

B. LOCAL OFFICES OF FOREIGN MANUFACTURERS/AGENTS

1. International Aeradio (M) S/B Non-directional Beacon IAL, United Kingdom
4 Jalan 19/3
46300 Petaling Jaya

Tel: 03-7572535

Contact Person:
Mr. Phua Kia Woo - Manager

2. Philips (M) Sdn. Bhd. Total airport systems Philips, Netherlands
No. 3 Jalan SS 15/2A including ILS, VOR,
47500 Subang Jaya surveillance radars,
or P.O. Box 12163 etc.
50768 Kuala Lumpur

Tel: 03-7345511

3. Thomson CSF Total airport systems Thomson CSF, France
7th Floor, Wisma Genting including ILS, VOR,
Jalan Sultan Ismail surveillance radars,
50250 Kuala Lumpur etc.

Tel: 03-2616370

Contact Person:
Mr. P. Bruyere
- Far East Liaison Officer

4. Hughes Aircraft International Command and control, Hughes, U.S.A.
Service Company radar and electronic
Bangunan Pernas International systems and other
17th floor, Jalan Raja Laut aviation support
50350 Kuala Lumpur products

Tel: 03-2611244

Contact Person:
Mr. W.W. Tombaugh
- Director, Kuala Lumpur Office

5. Marconi Italiana Asia-Pacific (M) Doppler VOR Marconi, Italy
Sdn. Bhd.
Level 15, Bangunan Tabung Haji
201 Jalan Tun Razak
50400 Kuala Lumpur

Tel: 03-2616166

Contact Person:
Mr. Andrew Sabaradnam
- Supervising Engineer

PROFILES OF MAJOR AIRCRAFT OPERATORS

1. NAME OF COMPANY : ROYAL MALAYSIAN AIR FORCE
ADDRESS : Station Udara
Jalan Lapangan Terbang Lama
50634 Kuala Lumpur
TELEPHONE : 03-2411133
CONTACT PERSONS : Deputy Chief of Staff, Material
Deputy Chief of Staff, Management Systems
Deputy Chief of Staff, Policy and Plans
NUMBER OF PERSONNEL : About 13,000
AIRCRAFT FLEET : 259

2. NAME OF COMPANY : MALAYSIAN AIRLINE SYSTEM
ADDRESS : Subang-Kuala Lumpur International Airport
47200 Subang
TELEPHONE : 03-7464555
TELEX : MA 37614
CONTACT PERSON : Mr. Salleh Salim Saadan - Engineering Development
and Services Manager
NUMBER OF EMPLOYEES : About 11,000

AIRCRAFT FLEET : 36

PAID-UP CAPITAL : C\$175 million

ANNUAL TURNOVER : C\$720 million

PRINCIPAL SHAREHOLDERS:

<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
Government of Malaysia (Minister of Finance)	42%
Government of Brunei (Brunei Investment Agency)	10%
Pemegang Amanah Raya Malaysia Sekim Amanah Saham Nasional	5%
Sarawak State Government	5%
Sabah State Government	5%
Others	33%

NATURE OF BUSINESS : Provision of air transportation and related services

3. NAME OF COMPANY : MALAYSIAN HELICOPTER SERVICES BHD.

ADDRESS : No. 9A Jalan Kemajuan
Section 13
46200 Petaling Jaya

TELEPHONE : 03-7561177

TELEX : MA 36430

CONTACT PERSON : Mr. Wan Malek Ibrahim - Executive Director
Mr. Abdul Rahman Datuk Samsu - Finance and
Administration Manager

NUMBER OF EMPLOYEES : 300

ANNUAL TURNOVER : C\$50 million

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
	MAS	40%
	Trengganu State Government	30%
	Sabah State Government	15%
	Sarawak State Government	15%

NATURE OF BUSINESS : Provision of air transportation and related services

4. NAME OF COMPANY : WIRA KRIS SDN. BHD.

ADDRESS : Light Aircraft Hanger Site
Subang International Airport
P.O. Box 12593
50782 Kuala Lumpur

TELEPHONE : 03-7762158

TELEX : MA 37696

CONTACT PERSON : Capt. Zulkifli Mohd. Annuar - Operation/
Administration Manager

NUMBER OF EMPLOYEES : 34

AIRCRAFT FLEET : 1 Aircraft and 1 helicopter

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
	Koperasi Tentera	30%
	Private	70%

NATURE OF BUSINESS : Provision of aircraft maintenance and handling services for other aircraft owners. Also provides general aviation and charter services primarily for petroleum companies and other private business companies

5. NAME OF COMPANY : PELANGI AIR SDN. BHD.

ADDRESS : Apprentice Training Building
MAS Complex B
Subang International Airport
47200 Subang

TELEPHONE : 03-7464555

TELEX : MA 37614

CONTACT PERSON : En. Syed Abdul Rahman Alhadad - Engineering Manager

NUMBER OF EMPLOYEES : 26

PAID-UP CAPITAL : C\$15 million

AIRCRAFT FLEET : 2

PRINCIPAL SHAREHOLDERS:	<u>Name of Shareholder</u>	<u>Percent of Shareholding</u>
	Trengganu Islamic Foundation	33.4%
	Wira Kris	33.3%
	Trengganu Development Board	11.1%
	Malaysian Airline System	11.1%
	Malaysian Helicopter Services	11.1%

NATURE OF BUSINESS : Provision of air transportation and related services

AIRWORTHINESS NOTICE

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Date: 1 April 1987

CERTIFICATION OF AIRCRAFT

1. Introduction

- 1.1 Applicants for Malaysian certification should be aware that all aircraft, irrespective of their size, will normally be subject to investigation by the DCA in order to establish, taking into account their design, construction, modification standard and original certification basis, that a level of airworthiness equivalent to that provided by Malaysian airworthiness standards has been achieved. The DCA will also require knowledge of the arrangements for post-certification design support in order to be satisfied that this airworthiness standard may be expected to be sustained after certification.
- 1.2 Malaysia does not issue Type Certificates.
- 1.3 Pending the release of detailed Malaysian Airworthiness Requirements, this Notice provides guidance on the investigations which the Department will need to make and the requirements to be satisfied prior to certification. However, for aircraft and products of United States origin imported from the United States, the Appendix to this Notice provides details of the definitive requirements for Malaysian certification. This information has been supplied to the FAA for inclusion in the next re-issue of Advisory Circular AC21-2; it should be noted that the information presented in the current issue 'E' of AC21-2 is now obsolete.
- 1.4 Prospective purchasers of used aircraft are encouraged to discuss their proposals with the DCA before arranging import into Malaysia.

2. Definitions

- 2.1 Special Requirements are those administrative requirements which must be satisfied as a condition of certification.
- 2.2 Additional Requirements are those additional design requirements found necessary by the DCA, in addition to the exporting country's certification basis, to provide a level of safety equivalent to that provided by the DCA airworthiness requirements.
- 2.3 Special Conditions are airworthiness standards issued to cover novel and unusual design features.

3. Types For Which A Malaysian Certificate Of Airworthiness Has Not Previously Been Issued

3.1 Design Investigation

- 3.1.1 The Malaysian investigation will be directed primarily to areas where the airworthiness standards, as applied by the original certifying authority, may not, in the view of the DCA, be equivalent to Malaysian standards. Compliance with the requirements of the Malaysian air navigation legislation in respect of mandatory equipment will also be investigated.
- 3.1.2 The extent and depth of the design investigation will vary according to the design features of the aircraft and the Malaysian certification category(ies) applied for (Transport, Aerial Work, Private, Special). Where an aircraft type has been designed to meet an internationally recognised code of airworthiness e.g. BCAR, FAR, JAR, but the type has not actually been evaluated by the national authority who prepared the code e.g. FAA for FAR, then the DCA reserves the right to consult the appropriate national authority as a part of its design investigation.
- 3.1.3 As a result of its design investigation, the DCA may prescribe Additional Requirements and the certifying authority of the country of origin may be asked to certify that compliance with such Additional Requirements has been established.
- 3.1.4 Where, in the opinion of the DCA, an aircraft is of novel or unusual construction Special Conditions may be imposed or certification may be refused.
- 3.1.5 The requirements of the Appendix to this Notice will be applied to all applications for certification of aircraft of United States origin which are imported into Malaysia from the United States. For all other

aircraft, the DCA will provide details of the requirements on request. However, applicants should note that in general the requirements of the Appendix will be adopted in principle to meet the circumstances of the particular case. Attention is particularly drawn to the Special Requirements detailed in paragraph 4 of the Appendix.

4. Types For Which A Malaysian Certificate Of Airworthiness Has Previously Been Issued

When an aircraft type has already been certificated in Malaysia, other series aircraft may be accepted without further design investigation. However, for an aircraft to be accepted as series, it is essential that it, and its equipment, should be demonstrated as being substantially similar to another aircraft of the type or variant thereof accepted for Malaysian certification; significant difference must be identified and may necessitate further design investigation.

5. Administrative Procedures

5.1 General

- 5.1.1 As Malaysia does not issue Type Certificates, applications for certification will only be considered where there is a likelihood that the aircraft type concerned will be acquired by a Malaysian operator. This will normally require that an application for Malaysian registration of the aircraft concerned is being processed or an approach to the DCA has been made by the prospective Malaysian operator.**
- 5.2.1 Application for registration should be submitted on form JPA-AP1 accompanied by the appropriate fee (refer to Airworthiness Notice No. 9)**
- 5.1.3 Applications for Certificates of Airworthiness should be submitted on form JPA-AP2 accompanied by the appropriate fee (refer to Airworthiness Notice No. 9). Appendix 'A' to form JPA-AP2 must be completed in full to provide details of the installed equipment etc.**
- 5.1.4 Where DCA staff will be required to visit locations outside Malaysia, the applicant will be responsible for associated travel and subsistence costs and an appropriate undertaking in writing must be supplied. An estimate will be supplied on request. In some cases, a deposit against these costs may be required.**

**DIRECTOR GENERAL
DEPARTMENT OF CIVIL AVIATION
MALAYSIA**

Date: 1 April 1987

MALAYSIAN ENTRY TO FAA ADVISORY CIRCULAR AC21-2**1. General**

- 1.1 This document specifies the special requirements and conditions to be satisfied for the certification and use in Malaysia of aeronautical products of United States origin imported from the United States.
- 1.2 Authority for aircraft registration and certification is vested in the Department of Civil Aviation (DCA); correspondence should be addressed to:-

Department of Civil Aviation,
Airworthiness Unit,
Terminal 2, Subang International Airport,
47200 Subang, Selangor,
MALAYSIA.

1.3 Malaysia does not issue Type Certificates.**1.4 Eligibility for the issue of a Malaysian Certificate of Airworthiness is determined by:-**

- (a) compliance with the appropriate requirements of paragraph 2, 3 and 4 of this document, (but see also paragraph 5).
- (b) compliance with:-
- (i) Additional Directives Issued by the United Kingdom Civil Aviation Authority.
- (ii) Airworthiness Notices Issued by the DCA which are classified as requiring a mandatory action.

NOTE: Compliance with the sub-paragraph (b) is not essential before export to Malaysia. However, as it may be difficult to establish conformity in Malaysia, details of any relevant service document and modification status will be helpful to the Malaysian user.

- (c) Completion of a flight test in accordance with a DCA approved Airworthiness Flight Test Schedule unless otherwise agreed by the DCA.

2. Eligibility For Export To Malaysia

- 2.1 Class I, II and III products must comply with the requirements of sub-part L of FAR Part 21 and the requirements of this document.
- 2.2 In addition, aircraft must be eligible for the issue of a standard airworthiness certificate as prescribed in sub-part H of FAR Part 21 unless otherwise agreed by the DCA.

3. Additional Requirements

- 3.1 This subject identifies those design requirements additional to the FAR certification basis which must be satisfied for a particular aircraft type to be eligible for Malaysian certification.

3.2 Additional Requirements for Malaysian certification are not specified for fixed wing aircraft:-

- (a) below a maximum authorised weight of 2730 kg (6000 lbs).
- (b) below a maximum authorised weight of 5700 kg (12500 lbs) when certification will not be applied for in the Malaysian Transport or Aerial Work Categories.

NOTE: Malaysian air navigation legislation requires the carriage of equipment on scales related to the purpose for which the aircraft is being flown. The aircraft commander is responsible for determining that an aircraft is properly equipped for any proposed flight.

- 3.3 For all aircraft other than those defined in paragraph 3.2 the DCA may prescribe Additional

Requirements. Details for any individual aircraft type will be supplied on written application; a limited type evaluation by the DCA may be required when no previous example has been certificated in Malaysia. Equipment required to be carried on flights for the purpose of public transport, to satisfy Malaysian air navigation legislation, will also be specified.

- 3.4 Additional Requirements need not necessarily be complied with before the Export Certificate of Airworthiness (FAA Form 8130-4) is issued. However, if the applicant for certification in Malaysia elects to satisfy any or all of the relevant Additional Requirements before the Certificate is issued, the Certificate must be endorsed in accordance with paragraph 4.4 (b) of this document. In such cases the applicant shall notify the DCA to enable details of the Additional Requirements to be provided to the FAA or appropriate designee.

4. Special Requirements

- 4.1 This subject identifies those special administrative requirements which must be satisfied for particular products to be eligible for Malaysian certification or use on Malaysian registered aircraft.

Applicability Code:

- + Required only with first of type and model exported to Malaysia.
- * Required only for aircraft with a maximum authorised weight greater than 5700 kg (12500 lbs).

4.2 All Aircraft

- * (a) **STATEMENT OF BUILD STANDARD** – This statement must include the aircraft specification, changes in design to satisfy Malaysian Additional Requirements and a list of Service Bulletins incorporated during manufacture. The list of Service Bulletin incorporation must identify:–
 - i) Production versions of the Service Bulletins
 - ii) Service Bulletins
 - iii) Alert Service Bulletins
 - (b) Copy of the production flight test report or a statement that no flight test has been completed.
 - (c) **MODIFICATION STANDARD** – This must include:–
 - i) Customer options and equipment incorporated including items of equipment not necessarily installed by the manufacturer of the aircraft.
 - ii) Service Bulletins compliance.
 - (d) Export Certificate of Airworthiness (see paragraph 4.4 of this document).
 - + (e) A copy of the aircraft Type Certificate Data Sheet.
 - (f) Details of any alterations which may have been embodied under the Supplemental Type Certificate procedure (STC).
- NOTE: Any STC which has been embodied but not previously investigated by the DCA will be subject to evaluation before a Malaysian Certificate of Airworthiness is issued.
- (g) A list of the defects, if any, at the time of issue of the Export Certificate of Airworthiness which will require rectification by the Malaysian operator.
 - (h) The FAA Approved Flight Manual or Pilots Operating Handbook for the individual aircraft concerned, for approval by the DCA.
 - (i) Airframe/engine/propeller/auxilliary power unit log books.

- (j) Seating configuration approval document, where relevant.
- + (k) Maintenance Review Board document, where relevant.
- + (l) A summary of FAA approved retirement life limitations.
- + (m) Electrical load analysis.

NOTE: For aircraft other than first of type, the DCA requires sufficient information to be available to determine the effect of customer options etc. on the supply of electrical energy to essential services.

- + (n) FAA approved Master Minimum Equipment List, where applicable.
- (o) Weighing report and associated weight schedule.
- + (p) Manuals required by the DCA:—

NO: REQUIRED

i) The FAA approved Flight Manual or Pilots Operating Handbook	2 (but see also 4.2 (h))
ii) Airframe Maintenance including wiring diagrams	1
iii) Operations	1
iv) Weight and Balance/Loading Procedures	1
v) Overhaul	1
vi) Structural repair	1
vii) Engine maintenance and overhaul	1
viii) Standard practices	1
ix) Non-destructive testing	1
x) Structurally significant items	1
xi) Maintenance planning guide including manufacturers recommended component overhaul lives	1
xii) Parts Catalogue	1
xiii) Set of Service Bulletins and Service Letters or equivalent documents	1

NOTE: A condition of Malaysian certification of the first of a type is the provision by the Malaysian applicant for certification of a continuing amendment service for the required manuals.

- (q) Record of compass system and magnetic compass swings.
- (r) Record of rigging checks.
- (s) A statement that suitable tests and measurements have been made and recorded to establish the satisfactory performance of the installed radio/radar apparatus and their associated antennae. A list of antennae positions must be provided.
- (t) Detailed list of equipment constituting the navigation and communications installation.
- (u) List of Serial Numbers of significant component parts.
- + (v) Noise Type Certificate.

4.3 Used Aircraft

In addition to the requirements specified in paragraph 4.2 (but (b) need not necessarily be complied with) the following information is required for used aircraft:—

- (a) Maintenance program to which these aircraft have previously been maintained including:
 - i) Previous check cycle.
 - ii) Future check cycle.
- (b) Component overhaul life summary, including details of service life remaining and modification standards.
- (c) Component and structure retirement life summary where applicable, including details of service life remaining.
- (d) Compliance with structural inspection program. This must include details of any structural sampling program in which these aircraft have been included, together with details of their position in this program.

NOTE: All used aircraft will be subject to a physical condition survey and review of the associated records, to the satisfaction of the DCA, before the issue of a Malaysian Certificate of Airworthiness is considered. In addition, approval must be obtained from the DCA for the applicant's proposals for integration of the aircraft into a maintenance programme approved by the DCA. Prospective purchasers of used aircraft are encouraged to discuss their proposals with the DCA before arranging import into Malaysia.

4.4 Requirement For Export Certificates Of Airworthiness (FAA Form 8130—4) to Be Issued

- (a) An Export Certificate of Airworthiness (FAA Form 8130-4) is required for any Class I product or engine module exported from the United States to Malaysia.

NOTE: In the case of aircraft, the Certificate shall not have been issued more than sixty days prior to the date of presentation for Malaysian certification, unless otherwise agreed by the DCA.

- (b) When Additional Requirements have been notified to the FAA or FAA designee in accordance with paragraph 3.4 of this document, the Certificate shall be so endorsed as to provide a detailed status of compliance. Items of non-compliance do not require a waiver from the DCA providing they are so endorsed on the Certificate, as Malaysia is principally concerned with establishing the status of compliance at the time of export from the United States.
- (c) The Certificate shall be accompanied by a document furnished by the applicant (e.g. a log book) which contains entries identifying those applicable Airworthiness Directives (ADs) with which compliance has been achieved. This document shall also identify those ADs containing a repetitive compliance requirement and when compliance is next due to be satisfied. All ADs shall be complied with prior to the issue of the Certificate unless a waiver has been issued by the DCA.

4.5 Appliances — General

- (a) For the purpose of this procedure, "appliance" has the meaning assigned to it in FAR Part 1 and includes associated replacement and modification parts.
- (b) The DCA will accept that an appliance has those characteristics vouched for on an FAA Airworthiness Approval Tag (FAA Form 8130-3). The procedures given in the following sub-paragraphs provide acceptable alternative means of compliance for appliances other than radio:
 - i) The appliance has been accepted by the FAA as complying with the Minimum Performance Standards of the applicable Technical Standard Order published in FAR 21 or,

- ii) In lieu of approval under a Technical Standard Order, the appliance has been accepted by the FAA as meeting the applicable FAR's and the terms of the applicant's specifications.

(c) An FAA Airworthiness Approval Tag must be supplied with all appliances.

4.6 Radio Appliances

The DCA may require a declaration of design and performance in the format specified in the current issue of British Standard Specification G. 100. Details for any individual type of radio appliance will be supplied on written request.

NOTE: Where a radio appliance has been approved by the United Kingdom Civil Aviation Authority, the item will be accepted by the DCA without further investigation. The relevant CAA approval number must be quoted on the FAA Airworthiness Approval Tag.

4.7 Products Other Than Aircraft Or Appliances

(a) Engines (including APUs), engine modules and propellers:-

- i) Export Certificate of Airworthiness (refer to paragraph 4.4).
- ii) Service Bulletin compliance statement.

(b) Class II as defined in sub-part L of FAR Part 21:-

- i) FAA Airworthiness Approval Tag.

(c) Class III as defined in sub-part L of FAR Part 21:-

- i) FAA Airworthiness Approval Tag or,
- ii) A certification by the manufacturer of the product that the product concerned was manufactured under a Production Certificate granted under sub-part G of FAR Part 21, a Parts Manufacturing Approval granted under sub-part K of FAR Part 21, or a Technical Standard Order authorisation granted under sub-part O of FAR Part 21, as appropriate.

5. Special Conditions

Where an aircraft is of unusual or novel design, the DCA reserves the right to prescribe Special Conditions or refuse certification. Applicants for Malaysian certification are advised to give early notification to the DCA of any aircraft type in this classification.

DEPARTMENT OF CIVIL AVIATION
MALAYSIA

AIRWORTHINESS NOTICE

No. 11 | Issue: 1 | Page: 1

Date: 1 April 1987

ACCEPTANCE OF AERONAUTICAL PARTS

1. Introduction

- 1.1 This Airworthiness Notice is issued for information and guidance on the procurement of aeronautical parts. It is of particular relevance to a person or organisation accepting aeronautical parts from suppliers and intending to incorporate those parts into an aircraft, its engines, propellers, or equipment.
- 1.2 The main purpose of the Notice is to highlight the responsibility of the end-user in determining that aeronautical parts are to the required build standard and are of acceptable manufacturing origin.

2. Definitions

For the purpose of this Notice the following definitions apply:-

- (a) Aeronautical parts are items intended for incorporation into an aircraft, its engines, propellers, or equipment, being items:
- (i) the failure or partial failure of which could adversely affect the continuing airworthiness or reliability of the aircraft or the safety of its occupants, or
 - (ii) prescribed in the Air Navigation Order and not specifically exempted from approval.
- (b) The User is the person or organisation incorporating the aeronautical part into an aircraft, its engines, propellers, or equipment.
- (c) A Design Organisation is an organisation recognised by the DCA as competent to design complete aircraft, engines, propellers, equipment, or modifications to such parts.
- (d) The Responsible Authority is the body in a foreign country which exercises control in a similar manner to the DCA in respect of regulatory procedures and airworthiness control of the item under consideration.

3. User Responsibilities

- 3.1 The User of aeronautical parts is responsible for ensuring that the parts are serviceable and conform to the standard determined by the appropriate Design Organisation as being suitable for the intended application. In order to discharge this responsibility to the satisfaction of the DCA the User must, when obtaining aeronautical parts from suppliers:
- (a) ensure that his purchase order contains accurate definitions of the aeronautical parts and full details of the quality control and certification requirements to be met by the supplier in satisfying the order;
 - (b) take all necessary steps to verify that the supplier is meeting the requirements of the purchase order.

The following paragraphs give guidance on acceptable means by which these basic responsibilities may be met.

4. Determination Of Quality Control And Certification Requirements

- 4.1 When an aeronautical part is designed or specified for a particular application, three primary parameters will have been established to achieve the requisite level of airworthiness, i.e. the performance, reliability/maintainability and life of the part. The final specification of the part will define, so far as is necessary, the materials and construction of the item required to ensure continued satisfactory performance, this build standard being identified by a description and part number provided either by the Design Organisation directly responsible for the part or by the Design Organisation responsible for the application of the aeronautical part. Variations to build standards are only permissible if modification action has been agreed with the appropriate Design Organisation.

- 4.2 Compliance with the requirement that the User be satisfied that the parts conform to the required build

standard may, for very simple parts, be achieved by on-receipt inspection alone. However, for more complex parts which are not inherently inspectable upon receipt, it is necessary to obtain convincing evidence as to the nature and adequacy of the manufacturing source of the parts. The supplier will usually offer some form of certification and the value of that certification must be carefully judged, taking into full account the type and intended application of the aeronautical part (paragraph 5 of this Notice gives guidance as to the relative value of various certifications). If the certification offered by the supplier would not give sufficient assurance of compliance then the User must either use an alternative acceptable supplier, or take additional steps to verify the adequacy of the source.

- 4.3 The range of additional steps available will vary according to the type and intended application of the parts, whether the parts are supplied from the manufacturer or through distributors, and the scope of the user's capability.
- 4.4 Compliance with the requirement that the User be satisfied, to an extent appropriate to the application, that aeronautical parts are serviceable at the time of use will always require some degree of inspection or test.
- 4.5 The final control system chosen, which may be a mixture of certification, on-receipt inspection or test, and/or direct surveillance at the source of supply, must be determined before orders are placed and appropriate requirements must be stated in the purchase order.

5. Sources And Certification

5.1 Manufacturing Sources

- 5.1.1 There are certain certifications which the DCA will accept as confirmed evidence of origin and adequacy of manufacturing source; these are as follows:-

- (a) From the UK; Approved Certificates issued by organisations appropriately approved by the CAA in accordance with Sub-Section AB of BCAR.

NOTE: Approved Certificates issued by organisations located outside the UK but similarly approved by the CAA are equally acceptable.

- (b) From the USA; Export Airworthiness Approval certification in accordance with Federal Aviation Regulations, Part 21, Sub-Part L.
- (c) From France; Bureau Veritas certification.

NOTE: Certifications in respect of overhaul, repair or similar activities, such as those issued by organisations approved by the CAA in Group B1, by FAA as Repair Stations, or in France by DGAC as Licensed Workshops do not suffice as evidence of manufacturing origin of the aeronautical part concerned.

- 5.1.2 As a general rule, the DCA will accept certification from foreign manufacturing sources if supported by any necessary technical documentation and adequate documentary evidence that:-

- (a) the manufacturing company is not covered by the procedures of paragraph 5.1 above;
- (b) the manufacturing company accepts responsibility for the parts;
- (c) the manufacturing company is under the control of the Responsible Authority who will, if requested, vouch for the company;
- (d) manufacture of the parts was in accordance with the requirements of the contract or order and the general quality assurance requirements of the Responsible Authority.

- 5.1.3 As a general principal, it may be assumed that aeronautical parts purchased as spares directly from the original manufacturer of an aircraft, engine, propeller or equipment will be acceptable provided that the appropriate certification is made, although that manufacturer may have sub-contracted the production of the parts and in some cases, may have arranged for direct shipment by the sub-contractor. It does not follow that orders for such parts may safely be placed directly on the sub-contractor. In such a situation, the sub-contractor may no longer be subject to the same controls as previously. The fact that a company producing aeronautical parts is a known and current sub-contractor for those parts aids confidence, but the company must still be regarded as a manufacturing source in its own right and due consideration given to source adequacy and certification as outlined in the foregoing paragraphs.

5.2 Purchase From Distributors

- 5.2.1 Extra care is required on the part of the User when purchasing aeronautical parts from distributors. In cases where the Responsible Authority provides for the approval of distributors, the User is responsible for determining the scope of the approval.
- 5.2.2 No certification given by such agencies can relieve the User of his responsibility for ensuring that purchased aeronautical parts are to the required build standard and are of acceptable manufacturing origin. In particular, certifications purporting to certify compliance with this Notice are valueless when issued by distributors since the requirements of this Notice are placed upon the User, not the distributor.

NOTE: The DCA does not as a general principle approve distributors. This activity will only be considered when the distributor concerned is already directly approved by the DCA for overhaul and whose exposition includes acceptable procurement procedures and a quality assurance system.

- 5.2.3 The User must still apply the considerations detailed in paragraph 4 of this Notice and ensure that his purchase order contains appropriate details and requirements as in paragraph 6. It is particularly important that the purchase order should, as a minimum, require the distributor to declare the country of manufacturing origin of the aeronautical parts and the type of certification provided by the manufacturer. The User will then be able to judge the value of that certification as evidence of acceptable manufacturing origin.
- 5.2.4 The extent to which the User can rely upon statements or declarations made by a distributor will vary according to the User's experience with that particular distributor. The verification procedures identified in paragraph 7 must be applied to a degree consistent with gaining adequate confidence in that particular supplier. Continuous satisfactory supplies over a period of time will help to reduce the need for verification checks on documentation but the checks should never be completely abandoned.

5.3 Surplus Or Used Parts

Aeronautical parts from surplus airline inventory, military surplus, salvage recovery, or part-used are frequently offered for sale. Prospective purchasers of such parts should note that DCA will require evidence that the parts are of an acceptable manufacturing origin, have not been misused, abused, or unacceptably modified and are in all respects fit for civil use. The preferred method of achieving this is to arrange for the parts to be re-furbished and re-certificated by the original manufacturer. Proposals for purchase of such parts or any cases of particular difficulty should be discussed with the DCA.

6. Purchase Order Requirements

6.1 Purchase orders placed on suppliers of aeronautical parts should specify the following:-

- (a) The full description and identity of the parts to be supplied; including part numbers and/or specifications, modification states, any special finishes or features, and any coding or identification relating to certification or type approval status (such as a CAA 'E' number or FAA TSO number).
- (b) The exact type of manufacturing certification and any supporting technical documentation to be:-
 - (i) provided, if the supplier is the manufacturer of the parts, or
 - (ii) acquired by the supplier, if the supplier is not the manufacturer of the parts.
- (c) That a certification be made by the supplier, when despatching the aeronautical parts that:
 - (i) the parts supplied comply in all respects with the description and,
 - (ii) if the supplier is not the manufacturer, the required manufacturing certification and technical documentation have been acquired and are available, and that the parts are in the same condition as when received.

In order to ensure corporate responsibility for the parts the certification should be made by, or with the express authority of, a senior executive of the supplying company.

- (d) If the supplier is not the manufacturer of the parts, a requirement that the supplier must, as a minimum, declare the country of origin of the parts and the type of certification provided by the manufacturer, in order that the User may properly assess the relative value of the manufacturing certification quoted.

6.2 A suitable certification to be made by a distributor is as follows:-

"The aeronautical parts identified on this document are supplied for acceptance by the User in accordance with the provisions of DCA Malaysia Airworthiness Notice No. 11. Certified that these parts have originated from qualified manufacturing sources, the country of manufacture and type of original certification being as stated above. Certified also that these parts are in the same condition as when received and, unless otherwise stated above, conform to the specification required by your order."

7. Verification Procedures

- 7.1 The User must institute adequate receipt procedures to confirm that aeronautical parts and their accompanying documentation comply with the terms of the purchase order. The degree of physical inspection of the parts to be undertaken by the User will depend upon the considerations outlined in the previous paragraphs. The User should also establish a system of confidence checks on his suppliers. This should include periodic requests for copies of original certification and associated technical documentation so that comparison can be made with the declarations made by the supplier.
- 7.2 Documentation checks should include verification that part numbers, and modification standards are correct, that the parts were obtained from the sources quoted with correct certification, and that the original certification relates to the total manufacture of the parts. In some cases, particularly where new suppliers are used, or problems are known to have occurred, it may be necessary for the User to arrange audit visits to the suppliers' premises, to assess at first hand the adequacy of the storage and control systems in use.

DIRECTOR GENERAL
DEPARTMENT OF CIVIL AVIATION
MALAYSIA

SUB-SECTION A8

CHAPTER A8—3 OVERHAULERS GROUP B1

Revised in part, 1st August, 1984

- 1 INTRODUCTION An Organisation may be Approved to certify that overhauls, repairs, modifications, replacements, inspections and tests to aircraft, engines, items of equipment or components thereof have been carried out in conformity with acceptable standards/specifications and CAA requirements, subject to compliance with the procedures set out in this Chapter. The Approval, when granted, will apply to the whole Organisation headed by the Chief Executive.
- 2 APPLICATION Form AD 457, copies of which may be obtained from the Civil Aviation Authority, Airworthiness Division, Brabazon House, Redhill, Surrey, RH1 1SQ, shall be completed and returned to the same address.
- 3 REQUIREMENTS FOR THE GRANT OF APPROVAL
 - 3.1 The applicant for Approval shall nominate the following persons:—
 - (a) A senior person, or group of persons, whose functions will include co-ordination of all appropriate departments to ensure compliance with the relevant airworthiness requirements and the technical content of customers' orders insofar as airworthiness may be affected. Such person(s) shall be directly responsible to the Chief Executive.
 - (b) Departmental heads and other senior members of the staff as appropriate to the class of work for which Approval is sought.
 - (c) Signatories to Approved Certificates, and Engine Inspection and Test Certificates (where appropriate).
 - 3.2 The applicant shall provide an Exposition (see A8-1 App.) of the Organisation, including the following information:—
 - (a) The terms of reference of senior technical personnel as applicable to activities under CAA Approval. Authority to negotiate directly with CAA on specific subjects shall be defined.
 - (b) The associated chains of responsibility.
 - (c) The scope of the overhaul/repair facility together with information on essential inspection and test equipment.
 - (d) The procedures adopted for controlling matters directly affecting airworthiness, and other technical standards which may affect airworthiness including the Quality Control Surveillance system operated in respect of sub-contracted work where applicable (see 3.10).
 - (e) Where approval for the amendment of manuals has been granted (see A8-3 Supplement No. 1), the procedures for controlling such amendments and certifications.
 - (f) Where the Supplementary Rating 'Airline Spares Transfer' has been granted, the procedures adopted to ensure compliance with 3.12.1.

- (g) Any further matters which the CAA decides are necessary arising from initial assessment or subsequent supervisory visits.
- 3.2.1 Unless otherwise notified, two copies of the exposition and of all subsequent amendments shall be supplied to the CAA, Airworthiness Division, together with a copy of the distribution list.
- 3.3 The Organisation shall, in the opinion of the CAA, be such as to ensure that, in all matters affecting airworthiness, full and efficient co-ordination exists within departments and between related departments.
- 3.4 The applicant shall satisfy the CAA that the persons nominated in accordance with 3.1 are capable and responsible persons and written evidence of their qualifications and experience shall be supplied. The applicant shall also satisfy the CAA that such persons are conversant with CAA requirements and procedures insofar as they affect the particular matters for which they are responsible. The CAA shall be satisfied that the management of the Organisation will be conducted with due regard to the needs of airworthiness and the character of airworthiness requirements.
- 3.5 The Staff in all appropriate technical departments shall be of sufficient number and experience as may reasonably be expected to undertake the volume of work in the class for which Approval is sought.
- 3.6 The staff shall be provided with adequate accommodation, facilities and equipment for the effective performance of their duties. Office, laboratory and workshop environmental conditions shall be controlled as necessary in relation to the work. Bonded and quarantine stores shall be provided.
- 3.7 The Organisation shall have facilities, or access to suitable approved facilities, for making such tests as are necessary to establish compliance with acceptable standards/specifications and the Requirements. The calibration of test equipment shall be checked as frequently as is necessary to maintain confidence in the accuracy of the equipment.
- 3.8 Inspection stamps, of a type and design Approved by the CAA, shall be issued to inspectors for their individual use.
- 3.9 The Organisation shall hold and make available to staff, CAA publications, Approved manuals, specifications, data sheets and related literature appropriate to the class of work for which Approval is sought. Suitable arrangements shall be made to ensure that these documents are amended up to date.
- 3.10 A Quality Control and Assurance system shall be operated to the satisfaction of the CAA in respect of all products handled under the terms of CAA Approval. In addition, Quality Control Surveillance shall be exercised in respect of any work carried for the Approved Organisation by an unapproved Organisation to ensure that the required standards of airworthiness are achieved (see A8-1, App. No. 2). Approved Organisations shall, as a condition of placing the order, arrange for the right of entry by the CAA to such an unapproved Organisation should the occasion arise. Placing of orders on an Organisation not Approved by the CAA is permissible only where the Approved Organisation possesses the full technical capability to verify conformance with acceptable Quality standards.

NOTE: CAA Approved Organisations, when undertaking work outside their terms of approval are deemed to be unapproved.

3.10.1 An Organisation approved as an Overhauler placing orders on an unapproved organisation shall satisfy itself that the origin of each item supplied is identified and satisfy itself that the item is acceptable and suitable for the intended purpose.

3.10.2 Definitions. The following definitions apply.

(a) **Quality.** The quality of a product is the degree to which it meets the requirements of the customer. With manufactured products quality is a combination of quality of design and quality of manufacture.

(b) **Quality Control Surveillance.** Supervision by the Approved Organisation placing the order of the unapproved Organisation's quality control organisation and methods.

3.11 A Certificate of Compliance (see A4—3) shall be issued in respect of each overhaul, repair, replacement, modification or inspection. Where work is carried out on part of an aircraft or its equipment by an Organisation not handling the complete aircraft, the Certificate of Compliance shall be retained by that Organisation and an Approved Certificate shall be issued to the consignee.

3.12 Approved Certificates, the form of which shall be Approved by the CAA, shall be numbered serially at the time of bulk printing, except as otherwise agreed by the CAA. The wording of the certification shall be as follows:—

Certified that, unless otherwise stated above, the whole of the above-mentioned parts have been overhauled/repaired/modified*, tested and inspected in accordance with the terms of the contract/order applicable thereto and conform fully to the standards/specifications quoted hereon and the requirements of the Civil Aviation Authority.

Signed
for and on behalf of
Date

*Delete where inapplicable.

3.12.1 Airlines holding an Air Operator's Certificate who are also approved under A8-3 may have the Supplementary Rating 'Airline Spares Transfer' added to their Schedules of Approval. For such transactions the Approved Certificates should be endorsed as follows:—

This Certificate covers the transfer of airframe, engine or accessory spares relevant to the types of aircraft operated under the Air Operator's Certificate which have been obtained from a source acceptable to the CAA.

NOTE: The only spares eligible for transfer are those detailed in the main aircraft/engine constructor's Spare Parts Catalogue and they must have been obtained from CAA approved sources as described in Airworthiness Notice No. 11 or from sources accepted in writing by the CAA.

3.13 Technical records shall be maintained and shall be such that proper correlation of all work carried out is established with relevant documents including the following, as appropriate:—

- (a) Customer's order.
- (b) Aircraft, engine or part.
- (c) Relevant standards/specifications.
- (d) Stores records.
- (e) Test and Inspection records including a record of each identified (i.e. by serial number) component and item of equipment.

- (f) Certificates of Compliance.
- (g) Outgoing Approved Certificate.

3.13.1 Essential records shall not be destroyed without authorisation from the CAA.

4 REQUIREMENTS FOR THE MAINTENANCE OF APPROVAL

- 4.1 The Organisation shall be maintained at the standard necessary to undertake the work for which it is Approved and the CAA shall, at all reasonable times, have access to the Organisation for the purpose of assessing the standard in use.
- 4.2 A proposed change of the Chief Executive shall be notified to the CAA in writing. The CAA may require the Organisation to supply further information in order to satisfy itself of the suitability of the official concerned insofar as it may affect the CAA Approval of the Organisation.
- 4.3 Changes in the persons nominated in accordance with 3.1 shall be notified to the CAA in writing for acceptance.
- 4.4 The Exposition required by 3.2 shall be reviewed periodically by the Organisation and any necessary amendments promulgated.
- 4.5 The Organisation shall consult the CAA if in any difficulty about the interpretation of the Requirements, associated procedures, or on any airworthiness matter which in their opinion involves new problems or techniques.
- 4.6 The CAA shall have the right to witness tests or inspections in any way associated with establishing airworthiness of an aircraft, engine or any part thereof.
- 4.7 The CAA may revoke, suspend or vary the terms of Approval if the conditions required for Approval are not maintained.

SUPPLEMENT No. 1 TO CHAPTER A8-3

Issued, 1st August, 1984

**AMENDMENT OF MAINTENANCE, OVERHAUL AND REPAIR MANUALS
AND WIRING DIAGRAMS**

- 1 INTRODUCTION** An Organisation approved as an Overhauler Group B1 in accordance with this Chapter A8-3, having the capability to carry out such work, may apply to have its terms of approval extended to include the initiation of amendments to Maintenance, Overhaul and Repair Manuals and Wiring Diagrams associated with the aircraft, engines, components and equipment specified in the Terms of Approval.
- 2 FACILITIES** An Organisation holding Group B1 Approval applying for an extension to its Terms of Approval to include the amendment to Manuals shall have adequate facilities and procedures for the preparation and substantiation of proposed amendments and a system for filing and recording the associated data and, where applicable, a system for promulgating the information.
- 3 CLASSIFICATION**
 - 3.1 Amendments to manuals and wiring diagrams are considered to be modifications and as such any proposed change must be submitted to the CAA Area Office for classification. The relevant procedures of Chapter A4-1 shall be observed.
 - 3.2 The CAA, in deciding upon the classification, will consider the airworthiness implication, the degree of CAA involvement, and the effect on the basis of original certification or similar acceptance of the aircraft, component or system.
 - 3.3 Due consideration will also be given to the technical expertise available within the Organisation to substantiate the amendment and whether or not reference should be made to the original manufacturer or similar source of specialised knowledge for guidance.
 - 3.4 Amendments will be classified as Major or Minor. Notification of a Minor classification signifies CAA approval whereas notification of a Major classification will require Form AD 282 procedure to be followed (see A4-1, 2.2.1).
- 4 TYPES OF AMENDMENTS**
 - 4.1 Amendments may only reflect the following:-
 - (a) Changes introduced by Service Bulletins, Service Letters, or similar documentation of UK or foreign origin, for which no Manual amendments have been issued by the manufacturer.
 - (b) Modifications introduced by Design Organisations acceptable to the CAA, other than the original manufacturer.
 - (c) Changes in methods and procedures of maintenance or overhaul tasks initiated by the Organisation.

- (d) Minor modifications proposed by the Organisation and approved by the CAA.
- (e) Changes or modifications associated with aircraft, engines, components and equipment specified in the Schedule of Approval.

- NOTES: (1) Where the original constructor is extant, he should be required to agree the change or at least issue a statement of 'no objections'.
- (2) In cases where the original constructor/manufacturer no longer exists, or can be shown to be unable or unwilling to respond, the CAA should be consulted and the judgement made that where the proposed change could have a marked effect on Airworthiness, there is sufficient evidence to determine that the effect will not be detrimental.

5 **PROCEDURE** Group B1 Overhauled approved to amend associated manuals will be required to adopt the following procedures:-

- (a) All proposed amendments shall be submitted to the CAA supervising Area Office for classification.
- (b) All pages forming part of the amendment shall be headed with the Organisation's name, title or other identification to avoid confusion with the original manual pages.
- (c) An initial amendment to a particular manual or drawing shall have a separate, suitably titled amendment record sheet.
- (d) Marginal lines shall be used to identify text material which differs from the original manual.
- (e) All amendments shall be certified by the Organisation's Quality Manager or Chief Inspector (see A6-2, 3).
- (f) All amendments subsequently issued by the original publisher of the manual shall be checked for their effect on the Organisation's amended pages.

APPENDIX No. 1 TO CHAPTER A8-1

Revised in part, 1st August, 1984

PRIMARY COMPANIES GROUP A1

1 INTRODUCTION This Appendix is intended as a general guide to the compilation of expositions as required by Chapters A8-1 to A8-6 of Sub-section A8.

1.1 Minimum acceptable requirements for compiling an exposition are not prescribed in this Appendix, but an exposition based on the content of this Appendix, would be acceptable to the CAA.

1.2 The exposition should be produced in a concise form, and its scope, insofar as it applies to the approval sought, should include (a) a description of the Organisation's premises and facilities, (b) details of the senior staff responsibilities, and (c) the procedures in use to ensure compliance with CAA Requirements and the Organisation's quality standards. The Exposition should be presented in loose leaf form, so that it may be readily amended.

1.3 Where an Organisation desires to use an exposition to satisfy requirements other than those of the CAA, the CAA has no objection to the inclusion of this additional information, provided that the CAA Requirements are fully satisfied.

1.4 An exposition cannot be completed until the relevant approval requirements of Sub-section A8 have been satisfied, and it must be in its final draft before agreement by the CAA, and before terms of approval can be granted. CAA Staff will discuss the Organisation's preliminary drafts during their visit(s) in order to agree the final content.

1.5 The Exposition will form the basis of CAA approval of the Organisation.

1.6 This Appendix has been written under the following headings:—

- (a) Identification of the Exposition (see 2.1)
- (b) Introduction (see 2.2)
- (c) Premises and undertakings of the Organisation related to CAA approval (see 2.3)
- (d) Terms of Approval (see 2.4)
- (e) Personnel (see 2.5)
- (f) Facilities (see 2.6)
- (g) Procedures (see 2.7)

2 BASIC REQUIREMENTS FOR AN EXPOSITION

2.1 Identification. The Exposition should be identified as follows:—

- (a) Company name, document title and reference number.
- (b) Amendment standard by issue number/date/amendment record.
- (c) Approval by Chief Executive.
- (d) Holders of the Exposition, i.e. distribution list.
- (e) Official title of person responsible for administration of the Exposition.
- (f) Contents List or Index.

- 2.2 **Introduction.** The Introduction should explain the purpose of the document for the guidance of the Organisation's own personnel, and should give general information concerning the Organisation's history and development, in order to provide background information to the CAA. Where appropriate, relationships with other Organisations, forming part of the same group, should be mentioned.
- 2.3 **Organisation's Premises and Undertakings.** Brief details of premises should be included quoting addresses, approximate floor space, and types of buildings. The scope of the Organisation's aerospace undertakings, at the addresses of the various premises, should be defined.
- 2.4 **Terms of Approval.** The Exposition will form the basis of CAA Approval. A concise definition of the work authorised will be prescribed in the CAA terms of approval. It is recommended that the CAA Certificate and schedule of approval are reproduced and included in the Exposition. The Schedule of Approval may, in some cases, be supplemented by Capability Lists. A Capability List must bear an issue number and date and may not be amended without the agreement of the CAA. A note to this effect should be included at the bottom of the page.
- 2.5 **Personnel.** This Section of the Exposition should nominate the persons required under paragraph 3.1 of the relevant Chapter of Sub-section A8, giving their terms of reference within the Organisation, and, in particular, outlining responsibilities for liaison with CAA. Duplicate copies of the CAA Form AD 458 should be completed by the persons nominated under paragraphs 3.1 (i) and (ii) of the relevant Chapter of Sub-section A8, and by such other persons as may be required by the CAA.
- 2.5.1 A diagram, or diagrams, showing chains of responsibility of nominated departmental heads, and senior technical personnel up to the Chief Executive, should be included. These diagrams should also indicate, by suitable means, and/or written description, how technical co-ordination throughout the Organisation is effected.
- 2.5.2 The 'Personnel' Section should also contain a list of Approved Signatories to the relevant Certificates and Declarations, which are required by Section A, giving their names, positions in the company, and sample signatures. Details of certification responsibilities should be included.
- 2.5.3 In some cases, the Organisation may wish to include more information, concerning personnel and their responsibilities, than is required by the CAA, but amendments to the Exposition which affect nominated staff, as required by BCAR, must not be made without CAA concurrence.
- 2.6 **Facilities.** This Section should provide information concerning the Organisation's technical facilities and associated essential equipment, which will vary according to the type(s) of activity involved and the specific terms of approval sought.
- 2.6.1 Under the Section devoted to facilities, information under the headings given below, should be included, where applicable. If there is a good deal of detailed information the use of Appendices is recommended.
- (a) Research.
 - (b) Design/Drawing Office.
 - (c) Development.
 - (d) Type Testing.
 - (e) Planning.

- (f) Manufacture and/or Process.
- (g) Overhaul and Repair.
- (h) Routine Testing.
- (j) Storage.
- (k) Quality assurance and/or Inspection.
- (l) Metrology and Standards.
- (m) Specialised Facilities e.g. NDT, Spectrography.
- (n) Publications and Library.
- (o) Technical Records.
- (p) Product Support.
- (q) Training.

2.6.2 The headings should be varied to suit the size of the Organisation and its activities.

2.7 Procedures. A concise description is required of the Organisation's technical procedures covering all aspects of work conducted within the CAA Terms of Approval; this should show how matters affecting airworthiness are controlled, by references, where appropriate, to existing internal instructions. In order to meet the Requirements, Organisations may elect to establish a Quality Control system (for approval as a Group A Company this is mandatory). The system adopted will, obviously, depend on the size and complexity of the Organisation and the nature of the work undertaken.

2.7.1 The headings below are examples of the procedures which may need to be covered in the Exposition:—

- (a) Quality programme, policy and administration, including the Quality Audit system.
- (b) Product design and development control.
- (c) Modification procedures.
- (d) Concession procedure.
- (e) Product evaluation, including product approval, field responsibility and defect investigation.
- (f) Reliability programmes.
- (g) Control of bought-out items, including Quality Control Surveillance of sub-contractors.
- (h) Manufacture and process control.
- (j) Control of stock, including procedures for handling non-conforming parts.
- (k) Tool, metrology and test equipment control.
- (l) Process Control.
- (m) Technical records.
- (n) Technical publications control, including Service Bulletin procedures.
- (o) Equipment overhaul, modification and repair procedures, including certification.
- (p) Test flight procedures.
- (q) Training.
- (r) Appendices, giving examples of (i) standard forms, cross referenced to the written procedures section; (ii) tags indicating the purpose and use of each; (iii) inspection stamps, and other identification symbols used to indicate status of parts; (iv) Approved Certificate and/or Test Certificate.

APPENDIX No. 2 TO CHAPTER A8-1

Issued, 1st August, 1984

SURVEILLANCE OF SUB-CONTRACTORS

- 1 INTRODUCTION** This Appendix is intended as a general guide to Approved Organisations wishing to place orders on unapproved Organisations.
- 2 EXPOSITION** The Prime Contractor should detail in the Exposition,
 - (a) the reasons for sub-contract control, its purpose and any other supporting data.
 - (b) the name of the person responsible for the quality of sub-contract work, and
 - (c) the procedures for controlling sub-contract work.
- 3 PROCEDURES** In making arrangements for adequate control of sub-contract work the Prime Contractor should take into account the procedures and responsibilities outlined in 3.1 and 3.2.
 - 3.1 Responsibilities of the Prime Contractor**
 - (a) Provision of adequate staff and facilities to enable the person responsible to implement the surveillance system. Periodic review of arrangements to ensure that procedures are adequate for the current work submitted to sub-contractors.
 - (b) Conducting an initial survey to ensure that the sub-contractor's inspection system and supporting facilities are adequate for the anticipated sub-contract work.
 - (c) Assessing all inspection fixtures and test equipment manufactured or bought out by the sub-contractor, particularly where these represent the sole acceptance standard.
 - (d) Maintaining a register of sub-contractors who, from the initial surveys, reach the required standard for the type of work to be carried out. This agreed list will be used when placing sub-contract orders and should only be changed with the agreement of the person responsible.
 - (e) Arranging periodic visits as necessary to ensure that the agreed standards are maintained by the sub-contractors.
 - (f) Ensuring that the sub-contractor establishes the cause of defects and deficiencies and takes prompt corrective action.
 - (g) Ensuring that all purchase orders/contracts specify adequate and precise requirements.
 - (h) Supplying the sub-contractor with all the necessary technical information (i.e. drawings, process sheets, company procedures) and ensuring that this information is kept up to date with subsequent amendments.
 - (j) Evaluating the quality of sub-contracted work. This will usually be by receipt inspection, and/or vendor rating arrangements, to ensure that the requirements of the purchase order/contract have been met, and the performance of the sub-contractor controlled.
 - (k) Providing a system to control items not conforming to the purchase order/contract and establishing an adequate concession procedure.

- (l) Maintaining records in connection with the supervision of sub-contractors and monitoring of sub-contract work.

3.2 Responsibilities of the Sub-contractor. The prime contractor should ensure before placing an order with a sub-contractor that the sub-contractor accepts the responsibilities detailed in paragraphs 3.2.1 to 3.2.8.

3.2.1 Nomination of Person Responsible. Nominate a Chief Inspector/Quality Manager, to be responsible for all technical aspects of the purchase order/contract. He must be technically and administratively competent and acceptable to the prime contractor. The Chief Inspector/Quality Manager must not be given discretionary powers to depart from the requirements of the purchase order/contract.

- (a) The Chief Inspector/Quality Manager should be responsible directly to a nominated Senior Executive who is not normally responsible for production.
- (b) The prime contractor should be notified of any change in the position of the Chief Inspector/Quality Manager, and of any other significant change of company ownership, structure, Directors, etc.
- (c) The Chief Inspector/Quality Manager should have access to all necessary technical and administrative documents.

3.2.2 Inspection/Quality Control Department. Provide an inspection organisation with adequate facilities and accommodation. Ensure the competency and efficiency of all inspectors engaged on sub-contract work.

3.2.3 General

- (a) Ensure that the production and inspection departments are provided with appropriate issues of drawings and associated data/instructions considered necessary by the prime contractor.
- (b) Ensure compliance with BCAR Chapter A8-10, Approval of Welders, where appropriate.
- (c) Make application under concession procedures to the prime contractor as necessary for the acceptance of manufactured items which do not conform to the relevant drawing(s), specification(s) or purchase order/contract.
- (d) Establish the cause of defects and deficiencies and take prompt corrective action.
- (e) Amend any technical information held on behalf of the prime contractor on receipt of such amendments from the prime contractor.
- (f) Notify the prime contractor of any errors found in their drawings, specifications, purchase order, tools, parts and materials supplied.
- (g) Ensure that no further sub-contracting takes place without prior permission of the prime contractor.
- (h) Permit right of access into sub-contractor's premises by the prime contractor and any CAA representative.

3.2.4 Measuring or Other Quality Control Equipment. Provide measuring, test equipment and apparatus as necessary to control process and product verification, unless supplied by the prime contractor. All equipment used for the inspection, process control and testing shall be calibrated and maintained periodically as agreed with the prime contractor. This applies to the sub-contractor's own equipment as well as that supplied by the prime contractor.

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3.2.5 Stores

- (a) Provide a Quarantine Store as necessary.
- (b) Provide a Bonded Store as necessary, and ensure that only supplies from this source are used for fulfilment of purchase order/contract.
- (c) Ensure that only material and parts which conform to specification requirements are used. Where appropriate, material shall be accompanied by an Approved Certificate. Aeronautical parts shall be accompanied by an Approved Certificate or acceptable release documentation as defined in Airworthiness Notice No. 11 to the satisfaction of the prime contractor's Chief Inspector/Quality Manager.

3.2.6 Records. Retain essential records in accordance with the requirements of the prime contractor. Such records should include the following information:-

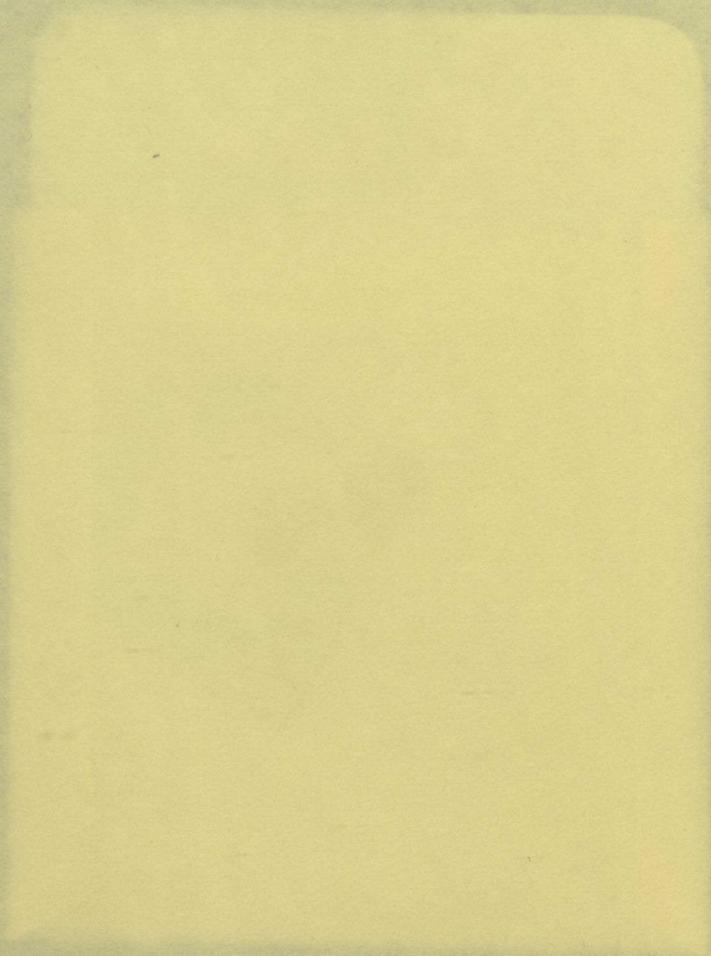
- (a) 'On receipt' inspection acceptance of all supplies.
- (b) Material identity and batch number from receipt to despatch.
- (c) Evidence of interstage and final inspection having been completed including the identity of the responsible inspection personnel.
- (d) Where applicable, statements of any authorised modifications incorporated during manufacture.

3.2.7 Inspection Stamps

- (a) Inspection stamps provided by the sub-contractor should identify an individual inspector.
- (b) Inspection stamp designs to be agreed by the prime contractor before use.
- (c) Internal register of the inspection stamps issued to be maintained.
- (d) Inspection stamp quarantine periods to be defined.

3.2.8 Release Certifications. Issue release certifications, each of which should conform with the following arrangements:-

- (a) All items supplied to the prime contractor to be certified as being in accordance with purchase order/contract.
- (b) Concessions granted by the prime contractor to be detailed.
- (c) The release certification document to contain information to enable co-relation with items supplied.
- (d) The following wording for the certification is normally acceptable:-
Certified that the goods listed hereon have been inspected and tested and unless otherwise stated, conform to the full requirements of the purchase order/contract.
- (e) The release certification documents to be signed by the Chief Inspector/Quality Manager of the sub-contractor or his delegated representative acceptable to the prime contractor.



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