AIRPORT DEVELOPMENT IN NIGERIA

Dr. I.U. William Osisiogu
Federal Commissioner for Civil Aviation

INTRODUCTION

The Federal Ministry of Civil Aviation is the second Federal Ministry to brief the nation on the scope of its activities and its achievements in the past 18 months since the Head of State, Lt.-General Olusegun Obasanjo, gave the directives on national briefing programme.

In this document, attention is focused on three main units of the Ministry, namely Administration, Civil Aviation and Meteorological services. Full details of the nation's airport development plans are also documented here.

CONTENTS

SCOPE OF ACTIVITIES

The Ministry of Civil Aviation is responsible for the regulation and well-being of the Civil Aviation Industry, including Air Transport licensing, air safety, air worthiness and operational safety including the licensing of pilots and flight engineers, the national air traffic services including air traffic control and telecommunications, airport planning and management, the well-being of general aviation, the collection and publication of economic and statistical data relating to civil aviation, and a large number of miscellaneous functions such as the general supervision of Nigeria Airways, and the Nigerian Civil Aviation Training Centre at Zaria. It is also responsible for the provision of weather information for agriculture, water resources and aviation.

To enable it perform its various functions efficiently, the Ministry is sub-divided into three main units, namely:

Administration,
Civil Aviation, and
Meteorological Services.

The Ministry's activities in the aviation industry are guided by the International Civil Aviation Standards and Recommended Practices, while its Meteorological activities are regulated on the international plane by the World Meteorological Organisation's Standards and Recommended Practices. The International Civil Aviation Organisation (ICAO) is an Agency of the United Nations responsible for civil aviation. Its activities are guided by the Chicago Convention of 1944 on International Civil Aviation. Standards and Recommended Practices contained in the seventeen annexes to the Convention provide guidance to civil aviation authorities of the contracting states.

REGULATION AND WELL-BEING OF THE CIVIL AVIATION INDUSTRY

It is the policy of the Federal Government to have formal air services agreements with all the countries whose designated airlines operate scheduled international air services to and through Nigeria. In order to make provision for its national airline to operate to all corners of the world and maintain easier communications between Nigeria and the other parts of the world, Government intensified its efforts during the past twenty-four

months to conclude air services agreements with many countries. Thus, the Ministry signed bilaterial air services agreements with Belgium, Mali, Ivory Coast and Niger, and negotiated similar agreements with the following ten countries: The Scandinavian countries (Denmark, Sweden, Norway), Ethiopia, Angola, Pakistan, India, Sudan, Liberia and Iraq.

The Government is determined to rectify the anomaly in the past whereby most of the foreign airlines operating scheduled services to and through Nigeria operated on the basis of provisional licences which conferred on them undue and unreciprocated privileges. An analysis of the agreements signed and negotiated forms Annex I of this booklet.

AIR LICENSING BOARD

This is an administrative board which is made up of a Chairman, a Secretary and three other members drawn from various sections of the Ministry. Its functions are to receive and consider applications from members of the public for permits to operate non-scheduled air charter services, either within the country or from specified points in the country to other parts of the world. Such services could be passenger or cargo services only or a combination of the two. On the receipt of such applications, they are duly processed and those that have fulfilled the necessary statutory regulations are gazetted to enable interested parties to raise necessary objections or make representations. The maximum period allowed for raising objections or making representations is 28 days from the date of the publication of the notices in the gazette.

On the completion of the preparation of the necessary briefs by the Secretariat, the Board would meet to consider the applications and make recommendations for the consideration and approval of the Commissioner for Civil Aviation in accordance with the powers vested in him by the Air Transport (Licensing) Regulations, 1965. On the approval of an application by the Commissioner, relevant permits signed by him are issued to the successful applicants. The permits so issued have varying periods of validity.

At the moment, the following organizations have been issued permits to operate non-scheduled air charter services.

(i) Arax Airlines — passenger and cargo
(ii) Pan African Airlines — passenger and cargo

(iii) Delta Maritime and Aeronautical Company	—	passenger and cargo
(iv) Aero Contractors Company of Nigeria Limited	—	passenger and cargo
(v) Bristow Helicopters	—	passenger and cargo
(vi) Nigerian Trade Wings Limited	—	passenger and cargo
(vii) Nigeria Air Transport Limited	—	cargo
(viii) International Aviation Services	—	cargo
(iv) General and Aviation Services	—	cargo
(x) Sudan United Mission	—	passenger

AD HOC SERVICES

By special permission, other airlines mainly from foreign countries which have no permits to operate scheduled services to Nigeria, are allowed to operate passenger and cargo charter services into and out of Nigeria. Majority of these operators operate mainly cargo services. Each operator is required to apply and obtain advance approval for every flight he intends to operate. Approval is usually based on concrete evidence that the cargo had been pre-cleared with Customs and that the importers had made satisfactory arrangements to clear the cargo from the apron, immediately the aircraft lands. These measures have been introduced to forestall possible congestion of the airports and to ensure smooth and orderly movement of aircraft to and from the airport. It is also necessary to ensure that foreign airlines are not given permanent monopoly of the lucrative aspirations in this field.

The following airlines operate *ad hoc* cargo flights to Nigeria:

(i) Transmeridian Air Cargo Limited
(ii) Trade Winds
(iii) International Aviation Services
(iv) Cargolux Airlines International
(v) Scandinavian Airlines
(vi) British Caledonian Airways
(vii) Express Flug
(viii) Aviaco
(ix) S.A.T.A

(x) K.L.M.
(xi) Pan American World Airways
(xii) Sabena World Airways
(xiii) Iberia Airlines
(xiv) Transavia
(xv) Alaska Airlines.

Approval had also been given to certain organizations to operate summer and winter charter passenger flights between Nigeria and the United Kingdom and the United States of America.

They include the following:

(i) Nigerian Charter Associates
(ii) Nigerian Association of University Teachers
(iii) Commonwealth Club of Nigeria
(iv) National Council of Women's Societies
(v) Christian Council of Nigeria
(vi) Leone World Tours.

Arrangements are in hand to appoint a judicial Air Licences Board, so as to free officials of the Ministry from this responsibility, as the practice is in most developed countries of the world.

AIR REGISTRATION BRANCH

The branch recommends for publication, regulations, orders, instructions and standards concerning the design and testing of engines and equipment, maintenance, repair, overhauling and flight test of aircraft including plant inspection, quality control and inspection's qualifications; negotiates airworthiness agreements with foreign states concerning reciprocal validation of certificates of airworthiness including maintenance engineers' licences. It determines and implements airworthiness requirements relating to aircraft structures and materials; processes specifications, aircraft power plants, propellers, fuels and lubricants, pressurized equipment, mechanical installations and fire prevention systems, aircraft electrical equipment, instruments and air-borne radio and radar equipment. It also prepares policy in relation to the inspection and approval of specialized workshops and distributors in the civil aviation industry. The Branch examines, licenses and disciplines aircraft maintenance engineers and approves related training organisations, approves priorities, standards and procedures of the engineering organisation of airline operators and approves maintenance manuals and procedures. It investigates aircraft defects and failures including those arising from air safety incidents

and reviews Nigerian airworthiness standards to ensure conformity with international requirements and current practices and procedures.

Personnel of the Air Registration Branch (A.R.B.) are known as Airworthiness Surveyors. The basic qualification for entry into the field is a University degree in aeronautical engineering with specialization in any aircraft trades like airframes, engines, avionics, etc.

FLIGHT CREW

The Nigerian Regulation requires that every pilot must have a type rating on the particular aircraft he is flying. There are a series of examinations he has to pass before such a licence is granted. The aspects that concern the A.R.B. are the technical examination, competence in using the classified performance rating of the aircraft and understanding of the loading procedure and limitations of the aircraft. The aircraft Flight Manual and the Operating Manual set out the information required of the pilot.

AIRCRAFT NATIONALITY AND REGISTRATION MARKS

All aircraft operating in Nigeria are foreign manufactured. Before an aircraft can be operated in Nigeria the A.R.B. must ensure that an aircraft can be operated in Nigeria, the A.R.B. must ensure that During the period of operation in Nigeria, it is the duty of the A.R.B. to establish a liaison with the manufacturer and the manufacturer's controlling authority i.e. A.R.B. foreign equivalents. This ensures that each aircraft is kept to the latest modification standard and each operator is kept aware of problem areas on the aircraft based on a world-wide operations statistics.

AIRWORTHINESS OF AIRCRAFT

No aircraft may fly without a Certificate of Airworthiness which is issued by the A.R.B. The certificate relates primarily to the type of aircraft, its engines and equipment, but each specific aircraft must have a certificate of airworthiness. The certificate confirms that the operator meets the airworthiness requirements of the A.R.B. in respect of design, construction, workmanship, performance, operating limitations, modifications etc. A certificate of airworthiness can be revoked by the A.R.B. if the aircraft is not maintained or modified according to the prescribed A.R.B. standards of the maintenance schedule or if any question of safety

arises following an accident.

To mention a few examples of documentation procedures required of every aircraft,the following come to mind: Certificate of Maintenance, Technical Log, Certificate of Compliance, Performance and Weight Schedules, Load sheet, Training Manual, Log Books, allowable deficiency..

The A.R.B. conducts the exercise of Certificate of Airworthiness Renewal on every aircraft annually. An interesting aspect of this is the test flight in which the A.R.B. has worked out a schedule for each aircraft so that the aircraft concerned is flown by an A.R.B. approved pilot to the limits of its flight capabilities. This obviously is far different from a normal flight. It is the duty of the A.R.B. to sample such flights and actually participate in recording the flights parameters. A detailed performance evaluation is later compared with the classified performance in the type specification data sheet.

Some of the Airworthiness Surveyors spent several weeks in the United States of America to carry out the Certificate of Airworthiness check in the newly acquired Nigeria Airways D.C.10 aircraft before its delivery. Annual Certificate of Airworthiness checks are performed on all aircraft registered in Nigeria. The A.R.B. is also involved wherever an aircraft on the Nigerian register is to undergo major overhauling or repairs. There have been occasions in the past when Airworthiness Surveyors had to travel out of the country whenever such major repairs were to be done in a hangar outside the country.

FACILITATION

The A.R.B. is vested with the powers of granting approvals to all maintenance organizations and processing work-houses. The structure of each organization must be studied and orientated in such a way that a safe air-craft engineering is ensured. The A.R.B. then grants the Air Operator's Certificate of Approval after the organization's structure and personnel have been documented in the Company Exposition. As a result of shortage of staff, comprehensive visits to approved companies have been limited to once a year but continuous dialogues are maintained with all the establishments concerned all the year round.

AIRCRAFT ACCIDENT INVESTIGATION

The purpose of an accident investigation is to find out the cause

of a particular accident so as to initiate a process which will ensure that such a cause is not repeated in any other aircraft. The A.R.B. participates in the investigation and the final write-up of the report. The A.R.B. specialists then meet to work out recommendations which are circulated to all operators of that particular aircraft type. The goal of the A.R.B. is to reduce accident fatalities in Nigeria to one per million flying hours. A few of the considerations taken into account in an investigation are: operation, weather, air-traffic control, witness statements, flight recorder, the aircraft structure, engines, systems, maintenance, human factor, fire, wreckage distribution etc. The A.R.B. investigator must be organized to collect all this information for further analysis.

OPERATIONAL SAFETY

To achieve this objective, the functions of three section: Flight Inspectorate, Pilot Examination and Personnel licensing are combined.

FLIGHT INSPECTORATE

Officers of this unit are designated Air Operators Inspectors. They are Pilots of considerable experience. Some Air Traffic Controllers, Operations Officers and Airworthiness Surveyors are nominated to perform the duties as well.

The Inspectors are authorised to proceed on all flights of Commercial Aircraft of Nigerian Registry on condition not subject to load with right of entry into the cockpit of such aircraft for the purpose of performing duties lawfully assigned to the Ministry. Such duties entail ensuring that both the Cockpit crew and the Cabin crew comply with relevant regulations. For instance, it is the duty of the Inspector to ensure that all the safety instructions which the Cabin crew should pass to the passengers are transmitted, that the emergency procedures are demonstrated and that the crew ensures that all seat belts are fastened when instructions to that effect are given.

The section also issues operating certificates to scheduled and non-scheduled carriers registered in Nigeria. As well, it determines operational standards and procedures for regular public transport operations and develops, prescribes standards and procedures for the licensing and flight check of air line pilots navigators and flight engineers. It also prepares Air Navigation Regulations and orders

affecting regular public transport operations, examines operational aspects in the issue of charter and aerial work licences and participates in Aircraft accident investigation. It is the duty of the Flight Inspectorate to pronounce on the adequacy or otherwise of the facilities and services provided by the Aviation and Meteorological Divisions.

PILOT'S EXAMINATIONS

Officers in this section are experienced Pilots who are designated Pilots' Examiners. They conduct practical flying tests for Pilots for which Ministry collects fees from the candidates. This section approves the training of personnel, participates in aircraft accident investigation, develops and prescribes standards and procedures for the training, flight examination and licensing of pilots of all categories and for the theoretical examinations consistent with all types of air crew licences. It also approves authorised examiners, establishes instructional standards for flying schools, and prepares programmes to ensure the continued competency of flight crew in the general aviation sector. The only Pilot Examiner available in the Ministry has been obtained from the International Civil Aviation Organisation under its technical assistance scheme.

PERSONNEL LICENSING

This section provides administrative support to the Pilot Examination Section and the Airworthiness Branch. The Section conducts theoretical examinations for Pilots and maintains records for all flight crew licence holders including training records. Due to the rapid development of the aviation industry in the country, the number of professional pilots issued with Nigerian licenses had doubled within the last one year. The statistics of licenses issued and renewed in 1976 form Annex II of this paper. The national airline (Nigeria Airways) has acquired wide-bodied aircraft and additional flight engineers' licences have been added to our list for this purpose.

The section also ensures that medical fitness prescribed by the International Civil Aviation Organisation for air and ground crews is maintained. To achieve this objective, the Ministry compiles a list of approved medical examiners who are only authorised to conduct such medical examinations. The Federal Ministry of Health's assistance is always obtained in carrying out inspections of the surgeries of applicants for approval as medical examiners to ensure that they are adequately equipped to carry out, the medical

examination.

Pilots with licences issued by other contracting states of ICAO have had their licences validated in Nigeria after passing a written test. A recent test conducted was in respect of the Douglas pilots flying the Nigeria Airways DC. 10 aircraft; they were required to possess a Nigerian licence to be able to fly a Nigerian registered aircraft.

AIR TRAFFIC SERVICES

Air Traffic Control — This section plans, develops and maintains air traffic control systems, operational control and search and rescue services and provides safe and expeditious movement of air traffic. It produces aeronautical information publications in accordance with the standards prescribed by the International Civil Aviation Organisation. The section also co-ordinates with the military authorities in respect to the utilisation of airspace for civil/military requirements, maintains the Civil Aviation Rule of the Air and Air Traffic Control section of the Air Navigation Regulations. It checks operating companies' weather minima; prepares emergency procedures including action on bomb warning in respect of all Government aerodromes; investigates Air miss reports; maintains liaison with the Meteorological Division; participates in aircraft accident investigation; prepares approach, landing and obstruction charts; plans navigational system for *en route* Air Traffic Control; determines the transition altitudes and levels in respect of each aerodrome and specifies requirement for briefing services to aircraft.

The Nigerian airspace which is referred to in the aviation world as the Kano Flight Information Region is divided into two sectors, namely:

(i) the Flight Information Centre at Kano which controls all aircraft north of the Rivers Niger and Benue from ground level to infinity and all aircraft south of the two Rivers above 10,000 ft., and

(ii) a sub-flight Information Centre located at Lagos which controls the traffic south of the two rivers from ground level to 10,000ft.

Various corridors referred to as advisory routes through which aircraft traverse have been established, but they are 50 nautical miles wide. Very active steps are being taken to narrow the width of the corridors to ten nautical miles thereby upgrading them to "Airways" where positive air traffic control can be provided to *en*

route flights.

CORRIDORS

The first of such corridors to be up-graded is the one running from Oshogbo to Kaduna and that running from Kano to Zinder (Niger Republic). Required navigational facilities have been installed along the routes. The facility at Bida which provides aircraft with range and bearing information is to be calibrated. Thereafter, the up-grading of the route to an airway will be effected. The international route from Accra via Lagos/Enugu to East Africa is about to be up-graded as well, because a facility (VOR) has been provided at Enugu which will make it possible for this to be done.

The Lagos Terminal Area has been expanded. The North Eastern Unit has been extended to Oshogbo thus enabling aircraft departing from, or arriving at Lagos to climb to appreciable heights within a controlled area — it enables arriving aircraft also to commence descent from their cruising level within a controlled air space, thereby increasing the standard of flight safety. A control zone has been established at Enugu within which Air Traffic Control service which hitherto was non-existent is provided. The period of operation at the aerodrome has been extended to cover eighteen hours. The volume of traffic at each of the aerodromes has increased substantially, thus increasing the work-load of the Air Traffic Controllers.

A special procedure for the transfer of traffic between Cotonou and Lagos has been established in view of the proximity of the Cotonou terminal control area to the Kano FIR boundary. A letter of agreement on traffic co-ordination with the Accra flight information centre is being negotiated to ensure safe operations of flights.

The emergency procedures to be followed in the event of an aircraft emergency at any of the aerodromes have been revised. Exchange of visits with Ghana, Republic of Benin and Niger has been made for the purpose of ensuring a high standard of traffic co-ordination between us and the adjoining Flight Information Centres so that the safe and expeditious flow of traffic in the *en route* phase can be assured.

A number of our Air Traffic Control Officers were sent to Australia, U.S.A. and the UK for various courses. They, in addition, attended various conferences organised by the International Civil Aviation Organization and Seminars organised by the

International Guild of Air Traffic Controllers and the African Civil Aviation Commission.

AIS UNIT

The Aeronautical Information Services Unit is responsible for the collection, recording and distribution of current information on aerodromes, air traffic control and telecommunications facilities and navigational hazards. It is also responsible for briefing services to aircraft.

The Nigerian Aeronautical Information Publication (AIP) has been revised and re-issued. The NOTAM distribution system has been improved to facilitate the dissemination of information. A reproducing machine has been purchased for this purpose and AIP amendment pages are now "printed" in AIS offices. More equipment are in the final stages of being purchased.

A cartography unit was established in July 1976 and two AIS personnel trained overseas run this unit with the co-operation and supervision of an air traffic service adviser. The cartography unit is responsible for the production of the approach and landing charts which assist aircraft to approach and land at the aerodromes using a particular facility with some degree of safety. Within the past years, the unit has produced six Instrument Approach Charts for Murtala Muhammed Airport, six for Kano, three for Enugu, four for Sokoto and four for Kaduna. Charts for Calabar and Port-Harcourt are being prepared and will soon be published.

Radar is being introduced into the air traffic control system. Terminal radar equipment is being acquired and will be installed at Lagos, Kano, Kaduna, Enugu and Port-Harcourt.

EN ROUTE RADAR

En route radar will be introduced in the near future. The country will then have complete radar coverage.

The Search and Rescue Procedure is in the process of being revised. The draft of the proposed revision has been forwarded to all government functionaries involved in such exercise for comments. A national meeting shall hold on 28th December, 1977. in Lagos to discuss the proposed amendments. A sub-committee will be established to arrange free movements of Nigerian aircraft, boats and search parties into neighbouring States without visa, when carrying out such operations.

TELECOMMUNICATIONS

The Telecommunication section is responsible for the planning, provision, operation and maintenance of communications and navigational facilities required for the safe, regular and expeditious flow of domestic and international air traffic within the Kano Flight Information Region in conformity with international standards and practices. This orderly flow of traffic demands facilities for:

(a) the instantaneous co-ordination of aircraft movement between air traffic control authorities at the despatching and receiving airports; direct air/ground communication between air traffic control and pilot;

(b) navigational guidance of aircraft between departure and arrival;

(c) approach and landing at the destination.

In short, the Telecommunications section provides, operates and maintains point-to-point circuits for the transmission of voice and printed (teletype) messages, enroute navigational facilities and terminal (approach and landing) aids. In addition to these major areas of responsibiltiy, the section also contributes to the general facilitation of passenger movement in the terminal area by the provision, operation and maintenance of public address systems and internal telephone facilities.

COMMUNICATIONS FOR AIR TRAFFIC CO-ORDINATION

The programme is very advanced and an Aeronautical Fixed Telecommunications Network (AFTN) is practically established. We have the capability of initiating, receiving and/or relaying international messages from neighbouring civil aviation administrations as stipulated by ICAO. The following radio links have been implemented:—

(a)	Kano/Niamey	(Teletype only)
(b)	Kano/N'djamena	" "
(c)	Kano/Brazzavile	" "
(d)	Lagos/Accra	" "
(e)	Lagos/Cotonou	(Voice and Teletype)
(f)	Lagos/Lome/Accra	" " "

The Ministry is now in the process of commissioning teletype circuits to Douala from Lagos and Kano respectively.

On the domestic front, voice communication has been established linking Kano to all the northern airports, and between

Lagos and the airports in the south. These two main centres (Kano and Lagos) are linked by voice and teletype circuits. Current development projects are aimed at replacing manual telegraphy circuits at all centres with modern teletype. Past dependence on leased P & T cables has been alleviated with the commissioning of dual Ultra High Frequency radio links to remote transmitting sites at Kano and Ikeja.

Voice communication between Air Traffic Control and aircraft is fully and satisfactorily established on both High Frequency and Very High Frequency. The coverage of the Very High Frequency service is being improved by the introduction of the Extended Range V.H.F. system based at Kano, Lagos and Enugu/Port Harcourt. This will ensure continuous contact with aircraft operating in the Nigerian airspace.

Overall improvement in the quality and reliability of all communications is being secured by the introduction of new and modern antenna systems, automatic error correction and voltage regulation at all Transmitting and Receiving facilities. A measure of improvement has also been achieved by the introduction of a V.H.F. channel dedicated to the dissemination of meteorological and other operational information of a routine nature which would otherwise clutter up the control frequencies. This service is being fully automated by the introduction of ATIS (Automated Terminal Information Service) at Kano and Lagos. This will further reduce control tower work-load. Steps have been taken towards securing the ultimate quality in telecommunications by the proposed leasing from the Ministry of Communications of high grade microwave circuits (voice and teletype) on both terrestial and satellite system. When these circuits are fully realised the existing High Frequency networks will be relegated to a secondary role.

EN-ROUTE NAVIGATIONAL FACILITIES

During transition from one airport to another, aircraft must be controlled. During this phase of a flight, the aircraft is required to report arrival over certain pre-determined *en-route* locations. These locations are therefore identified by means of ground-based radio aids. More positive control is assured under an airway system, whereby aircraft in flight are provided Air Traffic Control service along defined air corridors. The airways system is being introduced into Nigeria under the current development programme and each airway will be 10 miles wide.

The existing advisory routes were initially identified by means of

low and medium frequent radio Beacons installed at intervals along the route. Such facilities are inherently weather-conscious and unsuitable for an accurate definition of flight-paths during the rain when comulonimbus clouds are present. More dependable aids have been provided in the form of Very High Frequency Omnidirectional radio Range (VORs) co-located with Distance Measuring Equipment (DME). They are the best-known enroute aids. The width of an airway served by a network of VORs or VOR/DMEs is related to the system accuracy of these radio aids and to the number and location of such aids on the airway. En-route aids must therefore be sited very carefully. In siting these aids, due cognisance or advantage is taken of any existence of terminal VORs (TVORs) at the airports. Some of these terminal facilities do play a dual role as terminal and *en-route.* Such dual-role (TVORs) are consequently up-graded in their power output and coverage. *Bona fide en-route* aids are being implemented by dual-role facilities at Kano, Lagos, Sokoto, Maiduguri, Enugu and Port Harcourt. The approximate cost of the *bona fide en-route* VOR/DMEs is ₦750,000.

Although air-borne navigational systems have been developed which can dispense with ground-based radio aids, it is pertinent that these aids are nevertheless used, at least, for cross-checking purposes. In any case, most aircraft still do not carry these highly sophisticated and expensive navigation gear. The ideal system of en-route control which depends on the use of a network of long-range radars is planned for Nigeria in the eighties.

APPROACH AND LANDING AIDS

In the final stages of flight, an approaching aircraft must be guided to its destination and be assisted to execute a landing in adverse weather conditions at the destination aerodrome. There is therefore, a requirement for some aids for approach and landing. The approach aid is either a terminal VOR/DME located wherever feasible, on the extended centre line of the runway or an NDB. By flying an appropriate radial, an aircraft, the recommended aid is an Instrument Landing, in respect of jet aircraft, the recommended aid is an Instrument Landing System (ILS) configured for a category of operation dictated by physical terrain, obstacle restrictions and local weather conditions.

The standard approach aid adopted in this country is a low-powered terminal VOR co-located, in some cases, with a DME. As stated earlier, certain terminal VORs or VOR/DMEs are

operated in a dual role namely for *en-route* and terminal/approach purposes. In that case, larger power outputs are specified for additional coverage. Nearly all airports in Nigeria will be equipped with Terminal VORs or VOR/DMEs. So far, the following have been commissioned:—

Lagos (Iju)	VOR/DME	Dual Role
Kano	VOR/DME	Dual Role
Sokoto	VOR/DME	Dual Role
Kaduna	VOR	Terminal
Maiduguri	VOR	Dual Role
Oshogbo	VOR	Terminal
Port Harcourt	VOR	Dual Role
Enugu	VOR/DME	Dual Role
Calabar	VOR	Terminal

DMEs will be co-located with the VORs at *Kaduna, Maiduguri* and *Port Harcourt* before the end of 1977.

Orders have been placed for VOR/DMEs to be installed at *Jos, Benin* and *Ilorin.* DMEs have been ordered for co-location with VORs at Kaduna, Maiduguri and Port Harcourt.

The Ministry has adopted a policy enunciated at the ICAO regional meeting of January 1973 that airports served by jet aircraft should, wherever possible, be equiped with Instrument Landing Systems (ILS).

INSTRUMENT LANDING SYSTEM

An Instrument Landing System for a given airport is selected in conformity with the class of operation at the airport. The ILS operational category is determined on the basis of meteorological condition as follows:—

(a) Category 1 — Operation down to a decision height of 60 metres with a Runway Visual Range not less than 800 metres.

(b) Category II — Operation down to a decision height of 30 metres with a Runway Visual Range (R.V.R.) of not less than 400 metres.

It should be stressed that the Instrument Landing System is an aid and is not intended to replace the pilot or his discretion. Also

the ILS does not guarantee landing under ALL weather conditions. The decision to land or to divert in any situation is vested in the pilot who is guided not only by his experience but by his Company's operation manual.

So far two Category 1 ILSs have been commissioned on the secondary runways at Kano and Lagos. A third ILS is being commissioned at Enugu. Although the Kano, Lagos and Enugu ILS are operationally Category 1, the electronic performance of the ILSs themselves is to Category II standards. In effect CAT II signals are omitted. This omission is due to the fact that the operational categorisation is dependent on airport characteristics of which the ILS parameters are only a factor. Orders were placed in October 1976 for the following Instrument Landing System:—

(a) Kano Main Runway	2 ILSs (Cat II)
(b) Maiduguri Main Runway	2 ILSs (Cat II)
(c) Port Harcourt (New Site)	ILSs (Cat II)
(d) Calabar	1 ILS (Cat I)
(e) Benin	1 ILS (Cat I)
(f) Jos	1 ILS (Cat I)

RADAR

For effective control of air traffic at aerodromes where the traffic is dense or where aircraft of varying speeds operate within a limited terminal air space, the ideal aid is a Terminal Area Radar (TAR) sometimes called Airport Surveillance Radar (ASR). RADAR Stands for Radio Direction and Ranging which describes the primary function of the facility, namely to determine the direction (Azimuth) and range of any aircraft within the coverage limits of the facility.

This basic function is performed by *primary* Radar without any co-operation from the aircraft. More information can, be extracted from suitably equipped aircraft by the addition of Secondary Radar. Such additional information includes the Aircrafts' identity, its altitude, and whether it is under an emergency situation due to hijack or communications failure. The coverage of such radars is usually to a radius of 60—80 nautical miles. By the use of terminal radar, the Air Traffic Controller will have a continuous visual presentation of the progress of all aircraft in the vicinity of the aerodrome. The TAR must be viewed not only as a tool for expediting the flow of air traffic but also as a safety device. The Ministry is procuring five operational radars for Kano, Lagos, Enugu and Port Harcourt. A contract has been awarded to

a manufacturer for the supply, commissioning and short maintenance of the five Terminal Radar equipments, including a sixth for training at the Civil Aviation Training Centre, Zaria. The approximate cost is ₦9.8m.

FLIGHT CALIBRATION UNIT

All navigational aids put out for public use must be certified. This certification means that the aids have been flight tested by a competent authority in accordance with the programme specified by the International Civil Aviation Organisation. The flight-testing of our navigational aids has so far been carried out by foreign organisations.

With the rapid increase in the number and variety of navigational aids in the country, the cost of regular flight-testing is becoming prohibitive. For example, the current contract for this service is at an hourly charge of about ₦700. The estimated total cost for 1976/77 is ₦200,000; for 1977/78 it could be over ₦250,000 and by 1980, it could be over ₦500,000. It is evidently uneconomic to continue flight-testing on this basis and the Ministry has accordingly decided to expedite the establishment of its own Flight Calibration Unit. This will consist of a turbo-prop aircraft for routine and low altitude tests, a jet aircraft for high altitude tests, the airborne flight-testing, consoles and the ground support facility including workshops and laboratories. The tenders for this project have been evaluated and a contract would be awarded during February, 1977. It is anticipated that the unit will be functional before March 1978 and that we will be able to make the service available to neighbouring countries on request so that it could also be a revenue-earning project.

AIRPORT PLANNING AND MANAGEMENT

This Branch of the Ministry directs and co-ordinates those functions which relate to the provision, maintenance and operation of the National Airport System and the planning, construction and maintenance of airport facilities. It establishes policies and guidelines regarding the provision of the airport facilities and services compatible with the needs of users and with regulatory and safety standards. It also provides engineering and architectural support to all phases of the planning and design of facilities at the Ministry of Civil Aviation installations both on and outside the aerodromes. It ensures that Government aerodromes are regularly

inspected and that proper maintenance is carried out. It also provides advisory and consultative service to client organisations and to the public on engineering services in connection with airport design and construction. It is responsible for the establishment of standards and licensing of aerodromes including visual approach and landing aids.

The Ministry has completely taken over the maintenance of Kano and the Lagos/Murtala Muhammed Airports. Other Government aerodromes and landing strips are maintained on an agency basis. The Ministry of Works of the State Government in which the aerodrome is situated is the agent.

The Mechanical Section of the unit maintains all the Ministry's vehicles and plants. The Electrical Section was transferred to the Aerodrome Engineering Unit during the period under review.

On the aerodrome development programme, earthworks and pavements' contracts for Lagos, Kano, Port Harcourt, Calabar, Ilorin, Enugu, Maiduguri, Jos, Benin, Sokoto, Kaduna, Ibadan and Yola have been awarded. In addition, the contracts for the terminal buildings have been awarded for Lagos, Port Harcourt, Calabar, Enugu and Jos. Lagos which was originally designed for the B.747 type aircraft has been revised to accommodate the supersonic aircraft. Port Harcourt, Maiduguri, Kano, Kaduna, Sokoto and Ilorin will accommodate the B.747 type aircraft. The remaining aerodromes except Gusau are being constructed for the operation of the B.737 aircraft. Zaria, Gusau and Warri are the only airports where physical works have not started. Designs for Gusau and Warri have however reached advanced stages.

Of the total revised sum of about ₦700,000,000.00 for the 1975—80 Airport Development Programme, about ₦400,000,000.00 have been committed in contracts so far. Of this amount, about ₦200,000,000.00 has actually been paid for work done in the last two years. At this rate of progress, it is hoped that the programme will be substantially completed by the end of the plan period.

The following is the progress report on each of the entire projects:—

(i) LAGOS AIRPORT

Summary of facilities

(a) The new airport is designed to handle all existing and future generation of aircraft.

(b) Construction works on the airfield pavements and terminal buildings are 65% and 60% complete respectively.

(c) Contract works for some of the ancilliary buildings, power supply, water supply are to be started shortly. The contracts for these projects have just been awarded. It is ensured that the project will be completed before the end of 1978.

Since the commencement of the execution of the main contract, the following additional works have been executed to keep the services going.

(d) The northern apron on which aircraft operating domestic services are parked was extended to accommodate the increase in the Nigeria Airways fleet of B.737 and F.28 aircraft.

(e) The erection of temporary inflatable cargo sheds to ease the congestion due to inadequate facilities.

(f) Improvements to the roads, drainages and car parks and on external aesthetics of the present local terminal. These works have been substantially finished but the face-lifting exercise is still on.

In addition to the above, plans are at an advanced stage to provide the following at the present local terminal area:

(g) Improvement to the taxiways.

(h) The setting out and improvement of roads and parking bays at the existing general aviation area.

(i) The provision of flood lights at the northern apron where aircraft operating domestic flights are parked, and an uninterrupted power supply to both the local and international areas.

(j) The general survey and replanning of the domestic terminal area with a view to providing more parking facilities to meet the increasing traffic and the provision of offices for the airlines.

(k) The Earthworks and pavements of the Nigeria Airways maintenance area.

Terminal Building

(l) The terminal building project was also awarded to Strabag. It commenced a few months behind the Earthworks and pavements project. This project could not take off quickly because of serious shortage of cement and the port congestion which hampered the delivery of essential con-

struction equipment. Special berthing rights had to be given to ships containing equipment and materials for the airport. In addition, government appointed agents were ordered to give priorities to the Lagos airport projects and in some cases, the contractor was allowed to use imported cement. All these measures led to enormous progress and now the project is only a few months behind schedule. All the structural works have been completed. It is hoped that the control tower will be fully operational this year by which time the existing control tower will be demolished for the construction of a taxiway.

Tenders for the Flight Information Display and Decorative Control System have been invited. Details of procedures for the procurement of kitchen equipment and furniture are being worked out. But the consultants have been instructed to get on with their design for these items preparatory to international tendering. Nigerian artistes have been commissioned to provide special decorative art works at the terminal building. In addition, competitive art displays have been arranged for decorations in selected areas in the new terminal building.

(m) TERMINAL BUILDING ASSOCIATED WORKS — WATER SUPPLY IN THE PRESENT LOCAL AND INTERNATIONAL AREA

Interim measures to improve the supply and distributions of water in the existing terminal areas have been taken. Efforts are being made to lay new networks of pipes to be connected to a new booster station. While these works are on, arrangements have been made to supplement water supply by water tankers. Two water tankers have been acquired. Eighty per cent of the planned works have been completed. It is however, to be stressed that a completely new scheme of water supply to the new and the existing terminal areas of the airport is planned, and bids for the contract have been received and are being evaluated. When the scheme is completed, the entire water supply system of the airport will be independent of the general public supplies and water supply will be completely assured.

(n) TERMINAL BUILDING ASSOCIATED WORKS — IMPROVEMENTS AND EXTENSION OF THE LOCAL TERMINAL

To provide facilities for the ever increasing passengers at

the local terminal, extensions to the existing terminal building have been done. Internal and external face-lifts had virtually been completed. Realising the expansion limitations of the terminal building, arrangements have been made to provide "open air" sitting facilities which can be used by visitors and passengers alike and catering services can in fact he extended to these areas. To discourage "touts" extra measures have been made to seal off sensitive areas and guarded gates have been provided in strategic places for effective screening.

DETAILED REPORT ON THE NEW ACCESS ROADS TO THE NEW AIRPORT

(o) The main access road outside the airport boundary includes a flyover junction which was originally included in the access road project. Since the take-over of the Apapa—Ikeja expressway by the Federal Government, the Federal Ministry of Works has excised the works at the intersection of the roads from our contract and merged it with the contract for the Apapa—Ikeja expressway project. The rest of the project is however going according to plans and it is expected to be ready at the operational date of the new airport in 1978.

(p) THE INTERNAL ROAD CONNECTION BETWEEN THE NEW TERMINAL AREA AND THE EXISTING TERMINAL AREA

An improved road connection between the existing terminal area and the new terminal area is under construction. This road is to pass through the NAF area. Temporary quarters now being occupied by government staff will have to be demolished.

ANCILLIARY BUILDINGS AND FACILITIES AT MURTALA MUHAMMED AIRPORT

(q) Airport Hotel:
A hotel is proposed for the airport. Six firms which are interested in some form of joint participation with the government have been pre-selected. The consultants,

NACO, have submitted a draft feasibility report on the project. The final report is still awaited.

(r) Hydrant Fuelling System.
It has been decided that the oil companies should provide hydrant fuelling system for the main and cargo aprons in the new terminal area. A fuel farm is also to be provided and land has been allocated to the oil marketing companies for the purpose.

(s) Main Power Supply for the new airport:
Contract for the main power supply and distribution for the new airport has been awarded. The aim of this project is to ensure independent standby power to all airport facilities. Included in this project are "standby" for "standbys" to ensure that essential aviation facilities are never cut off especially at critical operational periods. It is a very important project which has to be completed before the airport becomes operational in 1978.

(ii) KANO AIRPORT

SUMMARY OF FACILITIES

Kano airport is designed to accommodate the B.747 type aircraft.

The apron is being enlarged to accommodate the anticipated traffic.

The secondary runway has been lengthened and strengthened so that it could be used by aircraft of the B.707 type during the reconstruction of the main runway. This secondary runway is also to serve as an alternative to the main runway when completed.

The terminal area is being reconstructed to provide more parking space and improve internal road system. An area is also earmarked for use as Hadj waiting area.

Designs for the modification of the existing terminal building are almost finalised. A new fire and rescue station with annexed control tower is being designed. Ancilliary buildings such as cargo building, port house, and Haqj buildings are being planned.

DETAILED REPORT ON EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS AT KANO INTERNATIONAL AIRPORT

reconstruction of 05/23 runway and the installation of

airfield lightings and navaids for the runway have since been completed in December 1975. This runway is now being used by aircraft of the B.707 type. The portion of Coleman Way at the end of runway 05 was closed because of its proximity to the runway. In its place, a new access road between the terminal area and Katsina Road is to be constructed. Phase 1 of this road between Coleman Way and Ashton Road has been constructed and it is now being used as the access road to the airport.

THE KANO AIRPORT GENERAL AVIATION AREA

A general aviation area is to be provided in Kano. The designs have been approved and the works are now incorporated into the earthworks and pavements contract.

APRON EXPANSION

The existing apron is being reconstructed and expanded to cater for the anticipated traffic. About 50% of the apron works have been completed.

ACCESS ROAD AND THE IMPROVEMENT OF THE LAND SIDE TERMINAL AREA

The access road is to be connected to the land side of a new terminal area. The present land side of the terminal area is inadequate for the present traffic needs of Kano Airport. Roads realignments and redesign of the terminal area have been done and construction has started.

MODIFICATIONS OF THE PRESENT TERMINAL BUILDING

Design of the proposed modification of the present terminal building is almost finalised. Work is expected on it before the end of 1977.

ANCILLIARY AND OTHER FACILITIES AT KANO INTERNATIONAL AIRPORT

The following ancilliary facilities are to be provided at Kano: —

NEW FIRE AND RESCUE BUILDING

This is being designed.

CARGO BUILDING

This is being designed. Temporary cargo sheds have been

provided. They will be used as soon as access roads to them is finished.

HADJ BUILDING

The final design of this building meant for the processing of Hadj passengers is under way. This building is to be completely isolated from the normal passenger processing areas.

(ii) CALABAR AIRPORT

SUMMARY OF FACILITIES

The runway is being reconstructed and upgraded to accommodate the B.737 type aircraft. It is expected to be completed in March 1977.

The building project which was started in November 1975 is expected to be finished later this year. The terminal building is constructed for international operations.

(iv) JOS AIRPORT

SUMMARY OF FACILITIES

The earthworks and pavements contract designed for B.737 has been completed.

The terminal building is well under way and it is expected to be finished before the end of this year.

The airfield lighting installation has commenced and it is to be completed within six months.

DETAILED REPORT ON THE EARTHWORKS AND PAVEMENT CONTRACT

The new Jos aerodrome is located at a new site on the Bukuru Road. The contract of the runway is completed. The following additional works are being carried out: —

Construction of a dam to cater for the long-term water requirement of the airport since the airport is remote from the town.

The civil works connected with the installation of the ILS.

The Ministry has formally taken over the runway, the apron and the links which have been completed; but aircraft are not allowed to operate to the aerodrome until all other facilities such as airfield lighting, the terminal building, and approach and landing aids are available.

REPORT ON THE TERMINAL BUILDING AND ASSOCIATED SERVICES

After a prolonged tendering period, the contract was

awarded early in 1976. The work is scheduled to be completed by August 1977.

(v) ILORIN AIRPORT

SUMMARY OF FACILITIES

The new runway is designed to accommodate the B.747 type aircraft and the layout of the airport is based on the principle that it is an alternate to Lagos.

The terminal building is designed to full international standard with facilities for domestic and Hadj flights.

DETAILED REPORT ON THE EARTHWORKS AND PAVEMENTS AND OTHER ASSOCIATED FACILITIES

The programme for this airport was initially planned to be executed in two stages. Stage 1 was to provide facilities for the operation of B.707, while Stage 2 was to enable B.747 aircraft be diverted from Lagos in the event of bad weather. The contract was started in early 1975 for the Stage 1 project. The Government has, however, recently decided to execute Stage 2 simultaneously with Stage 1 to avoid extra costs and operational inconveniences when Lagos Airport is ready for the B.747. The contract has now been varied to accommodate the extra works. In addition to this, the civil works connected with installation of ILS and the up-graded airfield lighting have also been ordered. The total Earthwork and Pavement Contract will be completed by the middle of 1978 when Lagos will be fully operational.

REPORT ON THE TERMINAL BUILDING AND OTHER ANCILLIARY SERVICES

This project has however been pushed very hard and various methods have now been devised to ensure early completion in order to reduce the gap between the operational dates of the runway and the terminal buildings. The contract award for the terminal building is expected to be finalised between June and July 1977. By early 1979, the whole airport is expected to be operational. In the interim, temporary and limited terminal facilities are being planned to permit aircraft operations as soon as the runway is ready by the middle of 1978.

(vi) ENUGU AIRPORT

SUMMARY OF FACILITIES

Ground facilities consist of runway, connecting taxiways and

the apron. Fully equipped terminal building and a car park. Ancilliary buildings like Fire and Rescue, and Power House are also provided. A two-lane access road connects the terminal area to the Emene — Enugu Highway.

DETAILED REPORT ON THE EARTHWORKS AND PAVEMENTS AND ASSOCIATED WORKS

The new runway of 2400 metres and width of 45 metres is designed to allow B.737 type aircraft operate at a maximum payload and to fly distances up to 500 nautical miles i.e. Lagos—Kano. The runway is being provided with category 1 ILS. Approach lighting system with visual approach slope indicators for both approach directions are available. The lightings and ILS are fed by high tension systems which have standby emergency power supply. The apron can accommodate three B.737 aircraft at the same time. This apron can be extended. Future parallel taxiway can be constructed when traffic demands it. Overlays can be easily applied to the runway in case heavier aircraft are to operate to the aerodrome. The terminal area and its buildings are connected to the public road by means of a dual lane paved access, and a terminal area road system. The layout of the roads system is such that part of the road junction is a dual lone one-way road. A paved parking area provides space for cars for travellers and visitors.

DETAILED REPORT ON THE TERMINAL BUILDING AND OTHER ANCILLIARY SERVICES

The basis of design of the terminal building is functional orientation and flexibility. The townside mainly caters for the service units such as offices, shops, kitchen, public address system, toilets etc. The apron side section accommodates the public areas, the control tower and the operations/office block. Departure hall entrance, various check-in counters and a conveyor belt, passengers' waiting facilities are provided in the garden, and a waiting lounge where meals may be served.

VIP rooms are provided between the waiting lounge and arrival hall. Large baggage counters are provided in the arrival hall. Cargo facilities with cold storage are provided within the terminal building. An eighteen metre high control tower provides a clear view to the approaches. Two operator desks and remote controls are accommodated in the air-conditioned control cabin. A bridge connects the control tower to the office block accommodating offices for A.T.C. officers, Nigeria Airways, Meteorology, Crew

and Airport Authority.
Ancilliary buildings provided are as follows:

(i) Fire and Rescue building
(ii) Maintenance Bay with greasing pit and workshop
(iii) Kitchen, Canteen and Stores
(v) Dormitory and toilet facilities
(v) AFL/Power building.

The aerodrome was officially opened in October 1976.

(vii) PORT HARCOURT AIRPORT

FACILITIES TO BE PROVIDED

Runway facilities for the operation of B.747 are being provided. The terminal building project includes facilities for international passenger needs. Ancilliary buildings including a separate cargo building are to be provided.

DETAILED REPORT ON THE EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

The earthwork and pavements contract was originally designed for B.707 aircraft operations. The contract was awarded in April 1975 and the works are scheduled to be finished towards the end of 1978. The status of the Airport has been reviewed. Consequently, the aerodrome is now being constructed to accommodate the B.747 type aircraft. The works involved in this up-grading have since been incorporated into the original contract. So far, the works have progressed well but there will have to be inevitable extension of completion date because of the additional works.

REPORT ON THE TERMINAL BUILDING AND ANCILLIARY SERVICES

The Port Harcourt airport is being constructed on a new site. The terminal building and utility buildings contract was awarded in June 1975 but physical work started in January 1976 because of the weather conditions peculiar to Port Harcourt. Moreover, there were serious difficulties encountered with poor sub-soil conditions and lack of access to the construction sites. The contract has run into several other problems connected with financial management. The Ministry has taken steps to solve these problems and visible progress is now being made. It is hoped that the project and all its associated works will be finished approximately the same time as the runways. Facilities being provided at the terminal area are as follows:—

(i) Cargo building
(ii) Ancilliary buildings like fire and rescue building, maintenance, power buildings, etc.

(viii) MAIDUGURI AIRPORT

SUMMARY OF FACILITIES

Runway to cater for B.747 type aircraft operations.

A new terminal area with provisions for extending the apron to accommodate anticipated traffic.

Terminal building and ancilliary buildings designed to cater for international flights. Separate cargo building is to be provided.

REPORT ON THE EARTHWORKS AND PAVEMENTS AND ASSOCIATED CONTRACT

The Maiduguri runway contract was awarded in September 1975 and work has progressed steadily although slowly. The contract was awarded for B.747 type aircraft operations. Although the runway is to be developed at the existing site, the terminal area itself has been shifted to a new location within the airport boundary, thus allowing for adequate capacity and expansion possibilities. The apron is to be extended to accommodate anticipated traffic. The apron contract is scheduled to be finished in early 1978.

TERMINAL BUILDING AND ANCILLIARY SERVICES BUILDING CONTRACT

This project has suffered considerable delay. The final drawings are at hand for tendering to start in March 1977. The facilities to be provided however in the terminal building include the usual international and ancilliary facilities for the B.747 type aircraft. A separate cargo building will be provided. As soon as the tender documents are ready an accelerated tendering procedure will be followed to obtain the quickest results.

(ix) BENIN AIRPORT

SUMMARY OF FACILITIES

The runway is to be up-graded and extended to accommodate the B.737 type aircraft.

The new terminal building and ancilliary buildings are for domestic use only.

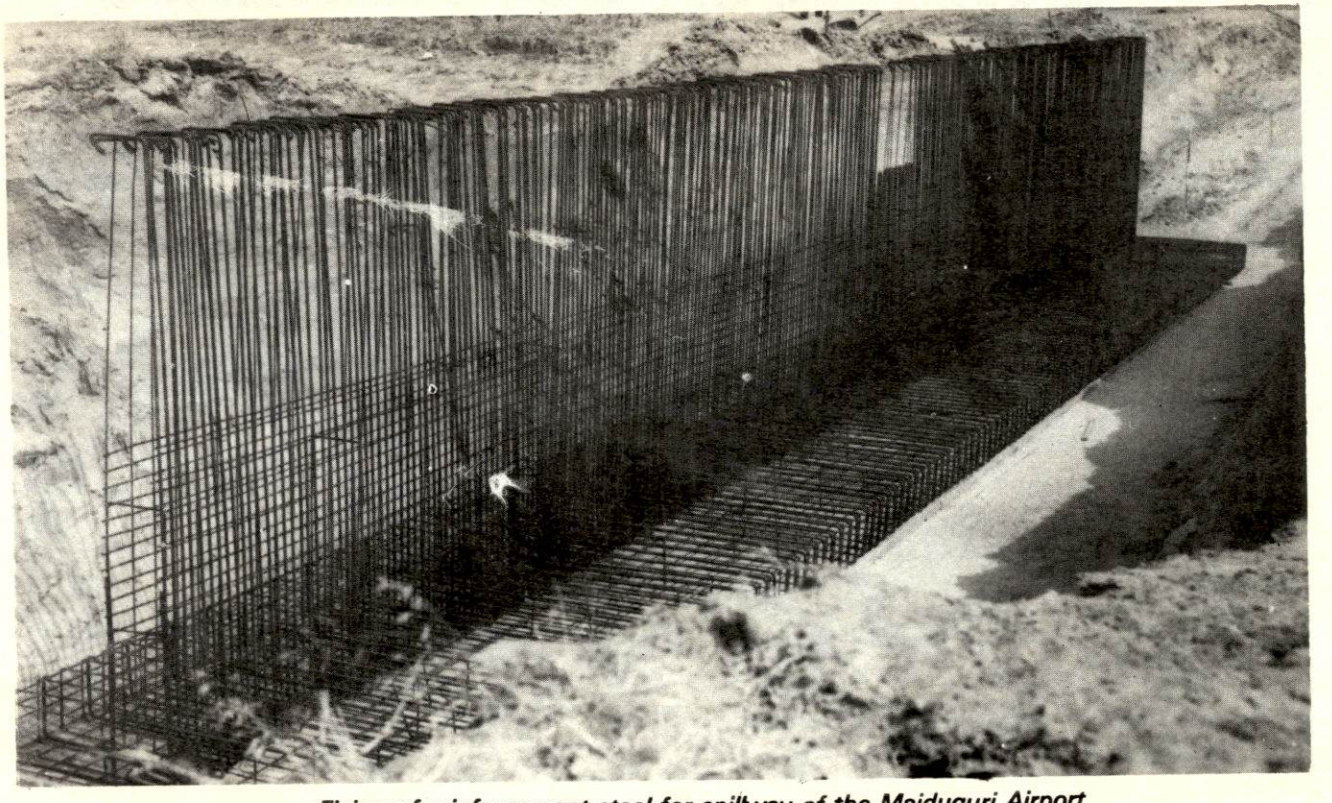
Report on the earthworks and pavements contract

The reconstruction works for the runway started in January,

Topsoil strip of the main apron from the new Port Harcourt Airport under preparation

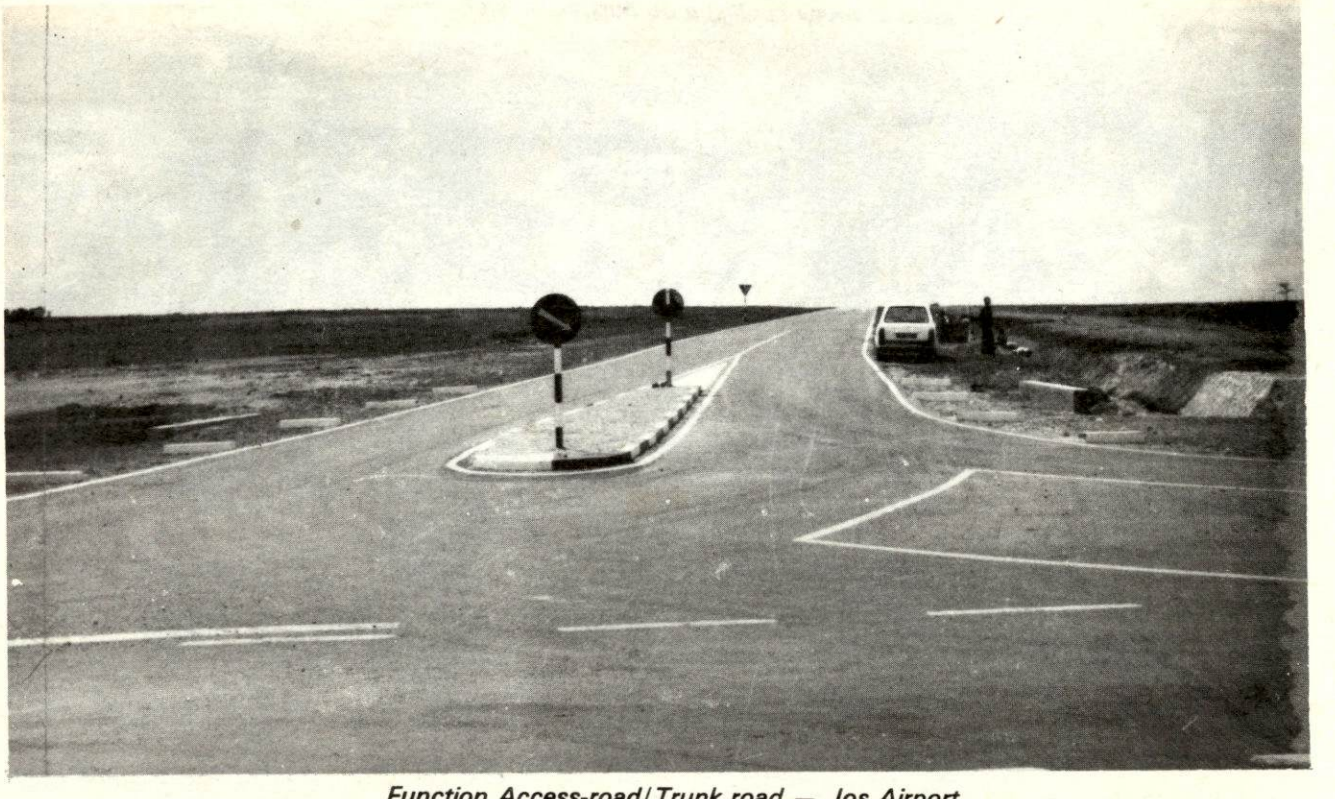
Earthworks of the new Port Harcourt Airport in progress

Spreading and compacting of sub-base material of the Maiduguri Airport in progress



Fixing of reinforcement steel for spillway of the Maiduguri Airport

Passengers embarking on a Nigeria Airways plane

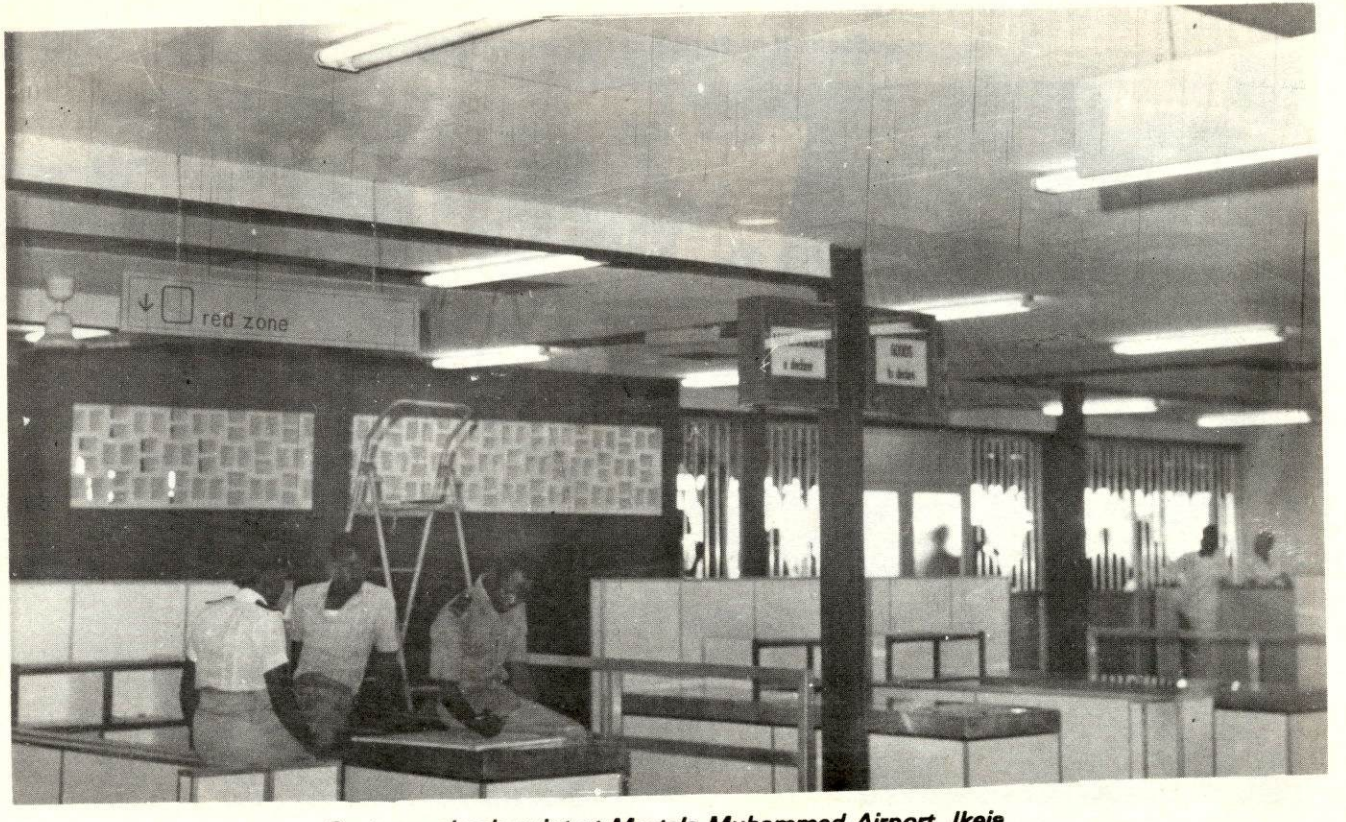


Function Access-road/Trunk road — Jos Airport

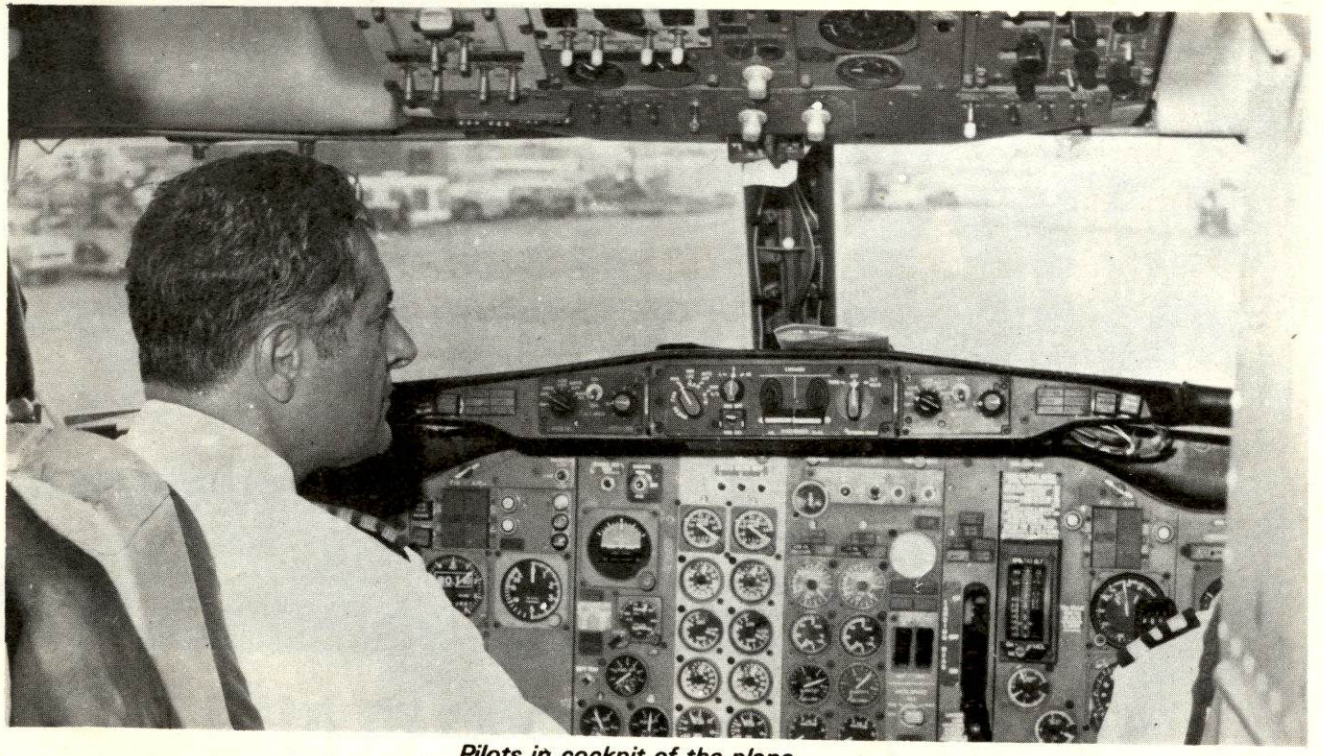
New Jos airport in progress — parking place in Terminal Area

Engineers fuelling a plane

Flight stewardess attending to passengers



Customs check-point at Murtala Muhammed Airport, Ikeja



Pilots in cockpit of the plane

Enugu Airport

Stewards and stewardesses on a Nigeria airways flight

Passengers on board

1976. The works consist of an extension of the runway and strengthening of the pavements. A new apron with connecting taxiways is also under construction. Progress on the works has been very good. The project is expected to be completed by the end of 1977.

TERMINAL BUILDING AND ASSOCIATED ANCILLIARY AND BUILDINGS

Final designs of the terminal buildings are almost completed. Tenders were invited by March, and an award is expected to be made by August or September 1977. The existing terminal building will however be improved to cater for the increasing passengers at Benin. The terminal buildings project is running behind schedule so an accelerated method of tendering will be effected to save time.

(x) KADUNA AIRPORT

SUMMARY OF FACILITIES

The runway is to be constructed to accommodate the B.747 type aircraft.

The terminal area is to contain the new terminal building and ancilliary buildings designed to handle international flights;

Separate cargo building is to be provided especially for the Peugeot Industry.

REPORT OF THE EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

A new aerodrome to serve the community in Kaduna is to be constructed at a new location. It will be a Customs aerodrome capable of accommodating the B.747 type aircraft. The earthworks and pavements contract was awarded in December 1976 and the work to be carried out includes terminal area, runway, apron with connecting taxiways and access road. The whole project is expected to be completed within 36 months.

TERMINAL BUILDING AND ANCILLIARY BUILDING AND ASSOCIATED FACILITIES

The final design for the terminal building contract is almost completed. Tenders were invited in March/April and award will be made in October/November, 1977. Efforts will be made to ensure that the terminal building and the earthworks and pavements projects are completed at the same time.

(xi) IBADAN AIRPORT

SUMMARY OF FACILITIES

Runway to accommodate the B.737 type aircraft to be built on a new site.
Terminal building and ancilliary buildings are to be provided.

REPORT ON THE EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

The contract on the new runway has just been awarded and work has started. The new airport scheme consists of a runway, an apron with connecting taxiways, a terminal area and airport access road. The works are expected to be finished within two years.

TERMINAL BUILDING AND ANCILLIARY BUILDINGS AND ASSOCIATED WORKS

Tenders have just been invited for the works connected with the terminal building projects. The terminal building is designed to cater for domestic flights only.

(xii) SOKOTO AIRPORT

SUMMARY OF FACILITIES

The runway is to be constructed to accommodate the B.747 type aircraft.
The terminal area is to contain new terminal buildings to cater for international flights. Other terminal facilities are to be provided;
Separate cargo buildings to be provided.

REPORT ON THE EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

The Sokoto Airport is to be developed at a new site. The contract award has just been made and work has since started. In order to improve the present facilities and to avoid an uninterrupted scheduled flights to Sokoto, it is planned to improve and extend the present runway for F.28 operations. This work will be done before the commencement of works at the new site. The whole contract is expected to last three years.

TERMINAL BUILDING, ANCILLIARY BUILDING AND ASSOCIATED WORKS

Final designs are on hand. Tenders were invited in May 1977 and an award will be made before the end of the year. The terminal building is being designed to cater for limited international flights.

(xiii) YOLA AIRPORT

SUMMARY OF FACILITIES

A runway designed for B.737 aircraft operations.

A new terminal area with connecting taxiways to the runway and apron, a new access road.

The terminal building is designed to accommodate local traffic.

REPORT ON THE EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

The existing runway is to be extended and reconstructed to accommodate B.737 type aircraft. The secondary runway is to be improved to allow uninterrupted operations of F.28 while construction works are going on. Contract for the commencement of works on the main runway has just been awarded and construction works are expected to start in early March 1977.

TERMINAL BUILDING, ANCILLIARY BUILDING AND ASSOCIATED FACILITIES

Final design of the terminal buildings and facilities have almost been completed. Tenders were invited in February/March and an award is expected to be made before the end of 1977.

(xiv) WARRI AIRPORT

SUMMARY OF FACILITIES

Runway for the B.737 type aircraft operations is to be developed.

Terminal facilities oriented to the local needs will be provided for domestic flights only.

EARTHWORKS AND PAVEMENTS CONTRACT AND ASSOCIATED WORKS

Site investigations have been completed and final design is expected to be finalised shortly. Tenders will be invited by middle of 1977 and an award will be made at the end of the year or early 1978.

TERMINAL BUILDING

The preliminary design for the terminal building has been submitted. Final design is expected to start soon. An award of the terminal building contract is expected to be made by the middle of next year (1978).

(xv) GUSAU AIRPORT

Site investigations for the site has started. An F.28 operation to Gusau with the earthworks to B.737 standard is being planned. Terminal facilities for domestic flights are also being planned. Work on Gusau Airport will begin early in 1978.

OTHER IMPORTANT PROJECTS FINISHED OR CURRENTLY IN HAND

Temprorary cargo sheds at Ikeja and Kano Airports

TEMPORARY CARGO SHEDS, AT IKEJA AND KANO AIRPORTS

Two temporary cargo sheds were erected in Lagos and the other two erected in Kano. The two sheds erected in Lagos have been relocated and are ready for use. Two more sheds have also been erected at the same place. The aim is to supplement the present cargo area with a view to decongesting it. Two sheds have also been erected in Kano and plans are on hand to erect one more shed at the same place.

EXTENSION TO THE EXISTING CARGO SHED AT LAGOS MURTALA MUHAMMED AIRPORT

Phase 1 of this project has been completed and Nigeria Airways have moved into the shed. Phase 2 of this project is yet to be finished. The Federal Ministry of Works is handling the project on behalf of the Ministry.

DRAINAGE SCHEME AT EXISTING KADUNA AIRPORT

This work has been completed. All repair works on the existing runway have been completed. The apron and car parking area have been extended and over-layed with asphalt.

AIRFIELD LIGHTING AT EXISTING KADUNA AND PORT HARCOURT AIRPORTS

The airfield lighting works at Kaduna have been finished and night operations have commenced. The works in Port Harcourt have been held up because of difficult terrain and land acquisition problems. Sixty percent of the works have been completed.

EXTENSION TO DOMESTIC TERMINAL BUILDING AT IKEJA

The extension and renovation of the existing local terminal

building have been completed. Considerable face-lifting works have also been done within and outside the building to improve the comfort of the travelling passengers.

TEMPORARY SHEDS FOR FIRE VEHICLES AT EXISTING AIRPORTS

All temporary sheds for fire vehicles at the airports have been completed.

SERVICE BAYS AT EXISTING AIRPORTS

All service bays at existing airports have been constructed.

APRON FLOOD LIGHTS FOR IKEJA INTERNATIONAL APRON

This project has been completed.

PROVISION OF OFFICES FOR CIVIL AVIATION STAFF AT IKEJA

Phase 1 of the offices to be provided has been awarded. This office is to accommodate the A.R.B. staff and the Personnel Licensing Section at Ikeja. A prefabricated office building is also being constructed for the Airport Authority staff.

STAFF HOUSES FOR CIVIL AVIATION

Five senior staff quarters for Civil Aviation have been completed.

CONSTRUCTION OF OFFICES FOR AIRLINES AND HANDLING AGENTS LAGOS MURTALA MUHAMMED AIRPORT

The offices are being planned.

OFFICE BLOCK TO ACCOMMODATE CUSTOMS, NIGERIA AIRWAYS AND HANDLING AND CLEARING AGENTS

This building which has been supervised by the Federal Ministry of Works has been substantially finished. It is hoped that it will be ready for occupation any time from now.

NEW AIRPORTS NOT INCLUDED IN THE CURRENT AIRPORT DEVELOPMENT PLAN

In view of the newly created States, the decision to transfer the Federal Capital from Lagos and the establishment of industries and

agricultural projects in the country, the government has appointed consultants to carry out feasibility study on the provision of aerodromes in the new Federal Capital and in each of the newly created States, Mambilla and Ajaokuta.

OPERATIONS/INSPECTORATE

Inspections of the privately owned landing strips were carried out for the purpose of renewing their licences. The cleaning of the terminal buildings at the Lagos/Murtala Muhammed and Enugu aerodromes have been given out to contractors.

To ensure safe operations of aircraft from obstructions and straying animals, the following existing aerodromes/airports have been secured by fencing the entire perimeters,

Murtala Muhammed Airport
Kano Airport
Jos Airport
Ibadan Aerodrome
Sokoto Aerodrome
Calabar Aerodrome
Enugu Aerodrome

whilst the remaining others would be fenced during the next fiscal year.

There are 30 Government owned landing strips. The strips are in a fairly serviceable state and feasibility study is in progress *inter alia* to determine the use and up-grading or otherwise of the strips.

There are 33 private landing strips mostly owned by Sudan Interior Mission 6, Sudan United Mission (4) Shell-BP (8) Flying Doctors Service (10) Aero contractors (1), Mobil Oil (1).

AIRPORT FACILITATION

The expeditious flow of arriving and departing passengers at International Airports has improved during the past twelve months by the provision of: —

More counters for Immigration and health officials at Murtala Muhammed Airport;
Establishment of red and green channels in customs' hall;
Passenger baggage trolling;
Two conveyor belts for easy indentification and collection of passenger baggage;

Security checking equipment.

Discussions are in progress with health, immigration and customs officials to streamline and reduce checking formalities e.g. inspection of passenger baggage on departure, health certificate on departure.

The creation and introduction of two channels at Kano and provision of separate waiting lounges for domestic and international passengers have eased the flow of passengers and this would be further improved when the proposed rehabilitation of the Terminal Building is executed.

CATERING AND CONCESSIONS

During the past twelve months the following catering concessions were awarded;

(a) Presidential Hotel — Enugu Aerodrome

(b) Federal Palace Hotel — Murtala Muhammed Airport, Ikeja.

Car Hire Service concessions at all airports/aerodromes are also under review as well as collection of tolls in order to generate revenue.

AERODROME FIRE SERVICE

This Section is responsible for

(i) taking measures to save lives in the event of an aircraft accident

(ii) Salvaging of aircraft and

(iii) protection of buildings and sophisticated installations from destruction by fire.

This contigency must therefore, assume at all times the possibility and need for the extinction of fire which may occur either immediately following an incident or at anytime during rescue operations. The rupture of fuel tanks in an aircraft crash and the consequent spillage of highly volatile fuels and other inflammable liquid used in aircraft operations present a high degree of possibility for ignition by coming into contact with hot metal parts of the aircraft or because of sparks caused by the movement of wreckage or disturbance of electrical circuits. Incidents may also occur through the discharge of accumulated electrical charges at the time of ground contract. An outstanding characteristic of aircraft fire is their tendency to reach lethal intensity within a very short time. This presents a severe hazard to the lives of those

directly involved.

For this reason, the provision of adequate and special means of dealing with incidents in the immediate vicinity of an airport assumes primary importance. Accordingly, airport fire fighting and rescue services have been established at all aerodromes to which scheduled services operate throughout the Federation including the two major international airports of Kano and Murtala Muhammed, at Ikeja.

With the advent of the wide-bodied jet aircraft, it has become necessary to acquire sophisticated crash and fire equipment. Specially designed fire trucks of highest off-road mobility have been purchased and positioned at the aerodrome. To ensure proper maintenance and effective operations, two experts have been obtained from the U.K. Government to provide on-the-job trianing to our firemen and mechanics.

The vehicles which are equipped according to the latest developments, are designed to deal with both aircraft and domestic fires and they fully meet the conditions laid down by the International Civil Aviation Organisation for all types of aircraft currently using our aerodromes. Regarding the new runway under construction at Murtala Muhammed Airport, which is designed to take all types of aircraft, including the B747, new Rapid Intervention Vehicles capable of providing cover for such category of aircraft are being orderd.

AIRPORT BUILDING AND INSTALLATIONS

The Aerodromes Fire Service is not only responsible for aircraft fire protection but also responsible for the fire prevention/protection measures in all airport buildings. The Aerodrome Fire Service has been involved in the examination of building plans to ensure that adequate fire protection/prevention measures are incorporated in them. Regular inspections of all buildings in the airport for proper house-keeping and regular maintenance of all first aid fire equipment had been carried out. Frequent and regular lecture tours within the airport are undertaken for the purpose of teaching members of the public simple first aid appliance operations thereby stressing the need for being fire conscious.

The general belief that incident of fire out-break at aerodromes is rare centred around the efficent manner by which the fire prevention/protection measures are being carried out by the Fire Section.

The absence of major destruction to buildings by fire at an

airport is as a result of prompt attendance of the airport fire service to any fire incident. Fires involving buildings and installations in an airport are stopped at the very incipient stages.

TRAINING

Following the introduction of the new sophisticated equipment into the service and the general expansion which has taken place in the service in recent years; a Fire Service Training School has been established at Murtala Muhammed Airport, Ikeja to provide the man-power needs of the service. Since its inception, over 600 fire-men of different grades have graduated from the school. Besides local training, a sizeable number of junior and senior fire officers have been trained abroad to meet the challenge posed by the large-scale developments of our aerodromes resulting from rapid growth in air transport.

As training forms an essential ingredient in maintaining good standards, the Fire Service Tranining School runs continuously throughout the year. Within the last 36 months, 21 of our officers have retunred from overseas course, and these officers apart from being based at the Lagos/Murtala Muhammed Airport and Kano, are also stationed at the smaller airfields. To overcome the shortage of water at the aerodrome, the Aerodrome Fire Service has acquired water tankers for water storage. Many aircraft emergency calls have been attended to at the various aerodromes.

FLYING UNIT

This unit acquired three additional Navajo aircraft from the Nigerian Air Force during the period under review. A number of young Nigerian pilots (about 16) were recruited for training as Pilot Examiners, Air Operators, Inspectors or Staff Pilots. Specialist courses were attended by the maintenance engineers of the Unit overseas. Aircrafts of the unit were used by officers of the Civil Aviation Division for the inspection of the aerodromes and to convey technical staff to certain locations for the purpose of carrying out major repairs on essential aids.

NIGERIA AIRWAYS

Follwoing the dissolution of the West African Airways Corporation in 1958, the West African Airways (Nigeria) Ltd. now Nigeria Airways came into existence on 1st May, 1959. Nigeria Airways is fully owned by the Federal Military Government of

Nigeria.

Graduating from the use of aircraft such as Doves, Herons, DC.3 and Piper Aztec, the national airline took a plunge into modern aviation business by acquiring medium and long range jet. At first, it was the Fokker 27 turboprops, followed by its faster and more comfortable sister Fokker 28. Within a short time, the airline had become a proud owner of the Boeing stratocruisers—B707 and B.737.

Today, 18 years after the establishment of the national airline, Nigeria Airways is proud to be the owners of a fleet of 20 aircraft with four others to join shortly. The fleet is made up as follows:

1 DC. 10—30
2 Boeing 707
2 Boeing 737) — as at 1976
7 F.28)
7 F.27)

On order, to be delivered in 1977
1 Boeing 707
2 Boeing 727
1 DC. 10—30

As indicated above, the fleet of aircraft operated by the airline increased by slightly over 100% in 1976 and an increase of 50% is envisaged for 1977.

The year under review shows an unprecedented growth in air traffic which necessitated increase in capacity. With the increase in aircraft and diversity in types, it became necessary to meet the question of manpower need especially in flight operations and engineering service. To this end and in pursuance of Nigerianisation policy, a good number of Nigeria pilots and flight engineers, including cabin crew were recruited and trained both locally at Nigeria Airways Ground School, Ikeja, the Zaria Civil Aviation Centre and abroad.

The company has on its pay role enough technical and engineering staff who are coping satisfactorily with the demand of modern trend in commercial aviation business. Overseas conversion and manufacturers, courses were also arranged for staff.

The Ground Training School based at Ikeja was established over twenty years ago and has been expanded to cope with training of ground staff as well as induction course for the freshers. All other arms of the company have periodical training of their staff both locally and abroad from time to time.

The Airline now operates both local and international commercial services. Within Nigeria, the Airline operates several routes to the major State capitals. Internationally, Nigeria Airways operates to countries in the heart of Europe, e.g. London, Rome and Amsterdam and along the West Coast of Africa it has succeeded in opening new stations at Niamey, Lome, Cotonou apart from its traditional routes, e.g. Ghana, Ivory Coast, Sierra Leone, etc. Plans are in hand to open a route- Lagos/Kano/Jeddah.

It is worth mentioning that recently the airline commenced operating wide-bodied DC. 10-30 aircraft on its international routes. This will enable the company to cope with the ever-growing passenger traffic. The utilisation of the aircraft owned by the airline will be progressively increased to meet the present and future traffic demand as the aerodrome development project embarked upon by the Mninistry is completed.

The following activities of the airline are worth mentioning:

COMMERCIAL.

(1) A booking office was opened at Ikoyi Hotel, Lagos

(ii) A booking office was opened at Isheri Road, Ikeja

(iii) A booking office was opened at Durbar Hotel, Kaduna.

(iv) A training course was arranged in Kano for the reservations staff and was conducted there.

(v) Additional route from Lagos to Abidjan via Accra commenced on 19th January, 1977.

ENGINEERING

(i) Building a new tyre bay outside south end of hangar.

(ii) Technical store extension: Construction of an extension to the original store is in progress to store DC. 10 spares.

(iii) F.28 tail dock has been renovated. Lager wheels and bottom sections strengthened with a view to easing maintenance problems on F.28.

(iv) DC.10 maintenance and handling are being negotiated with KLM.

MEDICAL

The airline considers the welfare and health conditions of its staff as paramount and to this end the medical personnel has increased relatively to the growth in staff strength. A new medical centre has now been identified as a necessity. The plan for the

building of a befitting medical Centre had reached the "drawing board" stage.

The management has succeeded in formulating and introducing a staff Administrative Manual. Among other things, the Personnel Department has evolved the following:

(i) Career prospect development, embracing career progression of staff of all levels.

(ii) Job evaluation and terms of reference have been firmly established for personnel of different cadres. This was made possible by the adoption of "bench mark" system.

(iii) A booklet entitled "Introducing people to Nigeria Airways" to enlighten the public on the activities of Nigeria Airways Ltd. in all aspects of its operations has reached the printing stage.

LEGAL, SECRETARIAT, INSURANCE & PUBLIC RELATIONS

The Public Relations Section has been reactivated to cope with unprecedented complaints by customers and to liaise effectively with its customers and the public at large. There has been tremendous improvement in the company's image through public relations activities which include:

(i) Visits by journalists who are given free access to inspect, observe and report about operations on a worked basis.

(ii) Constant seminars and workshop to enlighten the public on modern commercial transportation facilities.

(iii) The problems of pilferage of passengers' baggage and cargo have been considerably reduced. This was possible through the vigilance of our security network and the ease by which deserving claims are settled.

FLIGHT OPERATIONS DEPARTMENT

Flight Operations activities are as follows:

(i) Two Senior First Officers are awaiting upgrading to command.

(ii) Three Captains and three First Officers are on conversion training on B.707 at Lufthansa base in Frankfurt.

PROPERTIES DEPARTMENT

This Department initiated and is executing the following projects:

(i) Staff accommodation for Kano and Lagos — contracts already awarded.

(ii) Sky Power Village — land acquired at Ayobo Village at about 25 kilometres North-West of existing runway to cater for acute shortage of residential quarters for staff.

(iii) New Secretariat headquarters at Ikeja has reached advanced stage in accordance with the 3rd National Development Plan.

(iv) New air booking centres at various state capitals, including newly created states.

(v) Aircraft maintenance facilities hangar — 2 cell capable of accommodating wide cabin jet aircraft for both light and heavy maintenance. Locations are to be at Lagos and Kano.

(vi) New Catering Centre at Ikeja capable of supplying 15,000 meals per day.

(vii) New air booking centre headquarters at Lagos with modern computer facilities to co-ordinate all air booking centres out-stations for effective booking and reservations services.

(viii) Provision of staff accommodation in all State capitals.

NIGERIAN CIVIL AVIATION TRAINING CENTRE, ZARIA

The Nigerian Civil Aviation Training Centre (NCATC) which came into legal existence through the Nigerian Civil Aviation Training Centre Act of 23rd October, 1964, has grown from a very small office in Lagos to its present complex infra-structure situated in Zaria. The project had been conceived as a joint venture between the Federal Government of Nigeria, the United Nations Development Programme (UNDP) and International Civil Aviation Organization (ICAO). The UNDP/ICAO programme of assistance in terms of training, equipment and provision of expert instructors and technicians formed the major part of the project between 1966 and 1974. However, from 1st January, 1975, the institution had become mainly Nigerian with only a handful of UNDP/ICAO experts remaining in certain specialized areas.

The long range objective of the project is to provide the civil aviation industry,, on a continuing basis, with trained personnel who would be able to carry out their field duties so as to ensure safety of flight operations in conformity with standards and recommended practices of the International Civil Aviation Organisation.

The immediate objectives from 1966 onwards were to provide the much needed pilots, aircraft maintenance engineers for the

national airline, and also the air traffic services and aeronautical communications personnel and aeronautical electronics and telecommunications technicians and technologists needed by the Civil Aviation Department of Nigeria. However, the facilities had been extended to other African countries.

The Training Centre consists of four schools, namely, the Flying School which trains pilots; the Aircraft Maintenance School for aircraft maintenance engineers (airframe and engines, electrical and instruments systems); the Air Traffic Services and Communications School which trains air traffic controllers, aeronautical teleprinter operators and communications personnel; and the Aeronautical Electronics and Telecommunications School which trains the manpower required for the installation and maintenance of the navigational aids equipment such as Non-Directional Beacon (NDB), Very High Frequency Omni-Directional Radio Range (VOR), Distance Measuring Equipment (DME), Instrument Landing System (ILS) and Air Traffic Control Radar.

As at 1st January, 1974, four hundred and sixty-four students from Nigeria and other African and Asian Countries had graduated from the Training Centre as Pilots, Engineers, Controllers, Communication Officers, Aeronautical Meteorologists and Telecommunications Technicians. By 31st December, 1976, the total number of graduations at the Training Centre rose to 712, showing a percentage increase of over 50% from 1974 to 1976. During the same period, many short term specialised courses such as Independent Side Band (ISB)/Single Side Band (SSB), Teleprinter Maintenance, Multi-Engine Type Rating and VOR/SEL Equipment courses were conducted at the Centre.

FLYING SCHOOL

The Flying School offers a standard commercial pilot licence with Instrument and multi-engine rating course, and students graduating are expected to have had a minimum of 200 hours single engine flying in either Cessna 150 or 172, or both, 50 hours twin flying in the Piper Aztec aircraft, 50 hours instrument flight training on the Synthetic Trainer, and also 50 hours advanced instrument flight training. The minimum educational entrance requirement for the course is WASC with credits in English Language, Mathematics and Physics, or the equivalent passes in GCE 'O' Level. Additionally, to gain admission, candidates must be medically fit in accordance with ICAO requirement with particular reference to sight, hearing, blood pressure, and heart and lung

condition. Candidates are also normally required to undergo some aptitude tests conducted by the Training Centre in collaboration with the Test Development Research Office (TEDRO) of the West African Examinations Council, Lagos.

Towards the end of the course, the students sit the theoretical Commercial Pilots' Instrument Rating examination which is at present set and marked on behalf of the Ministry of Civil Aviation by the United Kingdom Civil Aviation Authority. The theoretical examination consists of the subjects: Flight Planning, Navigation (General), Navigation (Plotting), Meteorology and Radio Aids. During 1975, the Commercial Pilots' Course No. 7 students obtained 60% pass at the first attempt in the examination; it is gratifying to report that the candidates on the Commercial Pilot Course No. 8 obtained 100% (one hundred per cent) pass at the first sitting of the examination in April, 1976. The Flight Test which forms part of the Commercial Pilots' Licence with Instrument Rating examination is normally conducted by the Pilot Examiner of the Federal Ministry of Civil Aviation. Successful students are awarded the Commercial Pilots' Licence with Instrument Rating (CPL/IR) Licence and the Training Centre's Diploma. The duration of the course is two years.

AIRCRAFT MAINTENANCE SCHOOL

Aircraft Maintenance School offers courses leading to the Aircraft Maintenance Engineers Licence in Category 'A' Airframe and Category 'C' Engines, Category 'B' Electrical or Category 'X' Instruments. The minimum entrance qualification for each of these courses is also the WASC with credits in English Language, Mathematics and Physics, or the graduate certificate from a Technical School, in Mechanical, Automobile or Electrical/Electronics Engineering. The duration of the Course is two and a half years for Category 'A' & 'C' licence or three years for Category 'x' Electrical or Instruments. The examining body is the Air Registration Branch of the Federal Ministry of Civil Aviation.

AIR TRAFFIC SERVICES/COMMUNICATIONS SCHOOL

The Air Traffic Services/Communications School offers courses for Air Traffic Controllers, Assistant Communications Officers, and Teleprinter Operators. Students with the right aptitude come into the ATC Course with a minimum qualification of Higher School Certificate or GCE 'A' Level with three principal papers one of which must be a science subject preferably Physics, and also

with a medical fitness similar to that required of pilot trainees. The duration of the course is seventy weeks and students are expected to graduate with Private Pilots' Licence (PPL) and the NCATC Diploma in Air Traffic Control (Aerodrome and Approach). After leaving the Training Centre, the successful candidates are attached to the Lagos Control Tower or Kano Tower and within six months of such attachment they are expected to obtain Air Traffic Controllers Licence with Aerodrome and Approach Control Ratings. Further advanced courses — Area/Airways Control, and Terminal Radar Control are being planned to commence in 1977 and 1978, respectively.

The Communications Section of the ATS/COM School offers courses in Aeronautical Station Operation and Aeronautical Station Operator (Teleprinter) and Communication Officers (Advanced) Courses.

AERONAUTICAL ELECTRONICS AND TELECOMMUNICATIONS SCHOOL

The Aeronautical Electronics and Telecommunications School offers courses in Aeronautical Electronics and Telecommunications. Students, before graduating in the one, or two year course, acquire skills in the maintenance of such basic NAV-aids equipment such as the NDB and VRF transmitters and receivers. After gaining some field experience, they return to the Training Centre to obtain some specialized training in VOR and DME equipment, teleprinter maintenance, and ISB/SSB. New course in ILS and Air Traffic Control Radar equipment maintenance are being planned to commence during 1977. The minimum educational entrance requirement for these courses are also the WASC, or the Intermediate City & Guilds Diploma.

NEW AIRCRAFT ACQUISITIONS

During 1974—75, four new Cessna 172 aircraft were ordered and delivered to the Training Centre. A further two of the same type of aircraft were also delivered during late 1976. Delivery of two Cessna 150 Aerobats and three Piper Aztec 'F' aircraft would be made in early 1977. These deliveries would bring the total number of operational aircrafts to 23 — that is, 17 single engine of (Cessna 150s and 172s), and 6 twin-engine Piper Aztecs.

BUILDING PROJECTS

During the last 18 months, the building projects completed

include the new aircraft hangar (with laboratories and classrooms for aircraft 'X' electrical and instruments training), which was officially opened, on behalf of the Commissioner for Civil Aviation, by the Permanent Secretary. Also completed were: the Estate maintenance yard with stores, and a new VOR equipment shelter to house the new SEL-VOR and FACE/DME equipment. The contract for the building of the proposed jet simulator block and extensions to the ATS/COM and Electronics and Telecommunications Schools was awarded, and the building project commenced in August, 1976. A number of senior staff and intermediate and junior staff quarters were also built during the period in accordance with the development plan for the Training Centre.

See Annex III which contains an analysis (by numbers) of candidates admitted into the NCATC from 1973 to 1976.

METEOROLOGICAL DIVISION

The Meteorological Department, like other Meteorological Departments in other parts of the world is established for the study of weather and its effects on various human activities. In Nigeria, activities of the Meteorological Department have been centred on providing weather information for agriculture, water resources and aviation. These areas are buttressed by co-ordinated research and training, adequate network of stations throughout the country, efficient instrumentation and modern telecommunication facilities both in climatological data collection and processing using computerised methods and by the collection of weather data for day to day operations.

Within the period under review, 70 additional agrometeorological observatories of various categories have been established. These observatories are strategically located to provide observations representative of the particular agricultural region. In the river basin in Benue State, 12 hydrometeorological stations were opened; 10 similar stations were opened for Kaduna State Water Board, 10 stations for Cross River State Water Board, 12 for Kano State Water Resources Development Board, in addition to the several self recording raingauges supplied to research stations at Birnin Kebbi, Ijebu-Ode, Onitsha, Owerri and Ogoja.

One of the major functions of the Meteorological Department is to provide weather information to such users as agriculturists, aviators, hydrologists, engineers, planning officers etc. To provide

weather information for the whole country accurately and efficiently, weather observations made at the synoptic, upper-air agromet and hydromet stations have to be collected in coded forms at the main collecting centres, through a network of telecommunication channels such as radioteletype (RTT), high frequency transcievers, cable lines, telephone links and fixed aeronautical data channels (AFTN). In order to collect this observational data quickly and within the shortest possible time, exclusive meteorological telecommunication networks have been drawn up, and are being implemented gradually.

Within the period under review, at least 20 out of the present 35 synoptic stations have been supplied with two SSB transceivers each and in some of these stations where electricity was not available, generating plants have been installed too. Eight radio theodolite equipments for upperwind observations have been purchased, and arrangements for their installations are in progress. These steps so far taken, have considerably improved the collection of Meteorological data on the national level. On the regional and global level, two new point-to-point RTT links have been commissioned. Kano, the designated National Meteorological Telecommunication HUB (RTH) and the National Meteorological Centre (NMC) is linked with Cairo, Nairobi, Brazzaville. Niamey, N'djamena, Douala, and Ascension Islands. To achieve this, telecommunication equipment worth several hundred thousand naira have been purchased and action on installation at Kano and Ikeja meteorological offices is in progress.

In the field of agrometeorology, in addition to increasing the network of observations summarised past and present agromet data in form of bulletins are being disseminated on monthly basis. Further development of methods in agrometeorology to meet the agricultural operation in food production, land use and farm management is in progress. In the field of building, the Research and Training Institute building, the Stores and Electronic Workshop buildings, all situated at Oshodi have been completed within the period under review. A new Upper-Air Station at Minna was opened and daily aerological observations have started there. Work on the construction of the new prefab building to accommodate both the agromet, hydromet, and climatological sections of the Department has begun at Oshodi, while the contract for the new Meteorological Headquarters building

expected to cost about three million naira has been signed and construction work is expected to begin soon at Oshodi.

The other section of the Department which has shown a great deal of activities during the past 18 months is the Research and Training Institute at Oshodi. The Research Section, though in its embryonic stage, has intensified efforts to recruit and train the high level manpower essential for its effectiveness and productivity. The research results so far achieved have been published in various international journals of meteorology, in the Nigeria quarterly meteorological magazine, technical notes, and proceedings of international seminars and symposia. Outstanding in the research results obtained, of particular interest to the country are: —

(a) New information into the synoptic climatology and structure of the disturbance lines of West Africa;

(b) The interaction between large scale and smaller scale synoptic systems and its application to weather forecasting in West Africa.

Most of the activities of the Research and Training Institute has been in manpower training required to furnish both lower and middle manpower needs. For the successful implementation of the Development Plan, training has been varied in contents, scope and depth. Within the past 18 months, 30 Class II Meteorologists have been trained out of which,

10 officers came from Nigeria.
6 " " " Ghana
5 " " " Sudan
3 " " " Cameroun
3 " ' Sierra-Leone
3 " " Zambia

1 Class III Meteorological personnel
77 Class IV " " and Climat. Assts., and 39 part-time meteorological observers. Within the same period, the following meteorological personnel have been successfully trained

5. post-graduate Diploma candidates in meteorology at University, Ibadan.
3 post-graduate course candidates in agrometeorology in U.S.A.
2 graduates in meteorology from U.K.

1 Class II agrometeorological forecaster Nairobi, Kenya.
1 HTO refresher course student in telecommunication.

Those under training at the moment at the Institute include:—

25 Class II meteorological personnel
50 Class IV " " and Climat. Assts.
5 Class III agromet. personnel while
5 Class I meteorological personnel are at Ibadan University.
1 Class I " " for M.Sc./Phd in U.S.A.

1 Class II " " for degree in meteorology in U.S.A.

Also in this field of training for the necessary manpower, four officers have completed their advanced management courses overseas.

NIGERIAN AIRPORT AUTHORITY

The Nigerian Airports Authority is a body corporate set up under the Nigerian Airports Authority Decree which was promulgated last year.

The Authority has the following principal functions:

(a) To develop and maintain at airports all necessary operation of aircraft excluding navigational aids, telecommunications facilities and air traffic control services;
(b) To provide accommodation and other facilities for the effective handling of passengers and freight;
(c) To develop and provide facilities for surface transport within airports;
(d) To carry out at the airports (either by itself or by an agent or in partnership with any other person) such economic activities as are relevant to air transport; and
(e) Generally to create conditions for the development in the most economic and efficient manner of air transport and the services connected with it.

The functions will involve the take-over of the management of Government aerodromes hitherto performed by the Aviation Division of the Ministry, and the provision of ground handling services hitherto provided by Nigeria Airways to the airline.

In April, 1976, Government approved the draft agreement with

the Dutch firm of airport consultants, Messrs. Berenschot Noret Bosboom B.V., for the provisions of consultancy services for the establishment of the Nigerian Airports Authority. Soon thereafter, the project leader of the consultants and two of his immediate lieutenants arrived in the country to start preparations for their assignment.

They have reviewed and re-evaluated the major changes that had taken place in our airports since their main report was written in 1972. To do this, they travelled to all the airports in the country and saw the development that had taken place since 1972. On the basis of these visits, they submitted a report which is expected to provide the framework for the implementation of Phase I of the project. Phase I which is expected to last 12 months embraces, among other things, the setting up of the following:—

(i) a Technical Branch
(ii) an Accounting and Finance Branch
(iii) a Personnel Branch and
(iv) an Airport Management at Ikeja.

PARTICIPATION IN INTERNATIONAL ORGANISATION

INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO)

Nigeria became a member of ICAO in December, 1960, upon attainment of independence. The organisation is governed by an Assembly which meets once every three years to formulate policies and elect members to the Council comprising 30 members. The Council supervises the day to day activities of the Organisatioin. Members of the Council of which Nigeria is one are resident in Montreal, the Headquarters of the Organisation. An Air Navigation Commission of fifteen members (technical experts in the aviation industry) assists the Council in its work. Members of the Commission are elected by the Council on the recommendation of the contracting States. The Air Navigation Commission also meets regularly and the members are resident in Montreal.

As an active member of ICAO, Nigeria plays its role in fostering the aims and objectives of the organisation in the development of the principles and techniques of international air navigation and in planning and development of international air transport. This is accomplished by Nigeria's participation in ICAO conferences, seminars and statistical programmes. Nigeria also submits regularly its statistical returns to ICAO and pays its subvention to keep the organisation financially viable.

Nigeria has been a member of the ICAO Council since 1962 in Category III. An Assembly meeting is due about the third quarter of this year and Nigeria will seek a re-election into the Council but this time in the second Category.

Nigeria has, as a member of ICAO, enjoyed ICAO technical assistance through the UNDP. She is serving on the legal sub-committee and the panel on Automated DATA Interchange Systems.

AFRICAN CIVIL AVIATION COMMISSION (AFCAC)

AFCAC was established in 1969 and Nigeria was one of the foundation members. The Federal Military Government of Nigeria has ratified the AFCAC constitution. Nigeria is an active member of AFCAC. We pay our subvention to the organisation and supply it with statistical returns required for the careful planning and execution of air transport development programmes. Nigeria benefits from the results of research programmes and seminars conducted under the auspices of AFCAC.

COMMONWEALTH AIR TRANSPORT COUNCIL (CATC)

Nigeria became a member of CATC in 1961, following its attainment of independence in 1960. We participate in the Council's triennial assemblies and pay our contribution regularly to keep the organisation financially viable. Nigeria, as an active member of CATC, benefits from the activities of this organisation which serves as a medium of exchange of views and information between Commonwealth countries on civil air transport matters.

INSTITUTE OF AIR TRANSPORT (IAT)

Nigeria is an active member of IAT whose headquarters is in Paris. The Director-General of IAT forwards regularly to Nigeria, papers on new dimensions in air transport studies. We also pay our subventions annually.

IATA — The national airlines (Nigeria Airways) is a member of the International Air Transport Association.

W.M.O. — Nigeria is a member of the World Meteorological Organisation and participates fully in all its activities. The World Meteorological Organisation is a specialised agency of the United Nations, created to co-ordinate, standardise and improve the services of meteorology throughout the world. It has 144 on her independence. Each member of the World Meteorological Organisation designates by written notification to the Secretary-

General of WMO a permanent representative who should normally be the Director of its Meteorological Services to act on technical matters for the member between its sessions of congress which meets once every four years at its Headquarters in Geneva, Switzerland. The Congress is headed by an elected President, supported by three Vice-Presidents. The Executive Committee consists of the President, the three Vice-Presidents, the six Presidents of the Regional Association, and 14 elected Directors of Meteorological Services as Members. Nigeria's Director is a member of this Executive Committee by virtue of being the elected President of WMO Regional Association (1) Africa.

W.M.O. members are grouped into six regional associations, whose task is to co-ordinate meteorological activities within their respective regions.

W.M.O. has eight technical commissions composed of experts to study the application of meteorology to specialised fields. The technical commissions are: —

Commission for Basic System
Commission for Atmospheric Science
Commission for Aeronautical Meteorology
Commission for Special Application of Meteorology and Climatology
Commission for Marine Meteorology
Commission for Instrument and Methods of Observation
Commission for Agromet.
Commission for Hydromet.

Each of these Commissions meets once in four years. Nigeria has at least one designated member in each of these Commissions. W.M.O. organises the training of various categories of meteorology personnel through its own vote, and Voluntary Assistance Programme (VAP) offered by its members and UNDP. W.M.O. also co-operates with other international organisations in carrying out its functions especially:

ICAO in the field of Aviation
FAO in agriculture and food production
ITU in telecommunication matters, and
UNDP in training generally.

TRAINING PROGRAMME

During the past twelve months the following courses were attended:—

(i) Aircraft Accident Investigation — pre-mishap and post-mishap

(ii) Aircraft Maintenance Specialisation:—
  (a) pressurisation and fuel injection courses
  (b) electrical and instrument courses
  (c) aircraft Maintenance Engineers' Licence — ab initio

(iii) Personnel Licensing

(iv) Conversion courses and Assistant Instructors Ratings for Pilots

(v) Air Traffic Control
  (a) Air Traffic Control Course — primary
  (b) ATC Radar
  (c) ATC Supervisors Course
  (d) Advanced ATC Course
  (e) Cartography Course
  (f) Aeronautical Information Service Course

(vi) Aerodrome Engineering Design Course

(vii) Aerodrome Fire Service Training

(viii) Basic Electronic Course

(ix) Advanced Equipment Course

(x) Electrical ASEA Course.

Apart from in-service training undertaken locally, training of staff was carried out at the following institutions:—

(a) Nigerian Civil Aviation Training Centre, Zaria
(b) U.K. Civil Aviation ATC College, Hurn.
(c) IAL ATC School, Oxford, U.K.
(d) F.A.A. Academy, Oklahoma City, USA
(e) Swedish College of Aeronautics, Stockholm
(f) Ministry of Civil Aviation, Australia
(g) Department of Aeronautics, Canada
(h) Oxford Air Service Training, U.K.
(i) Civil Aviation Standard Technical Establishment Betchley, U.K.

BILATERAL AIR SERVICES AGREEMENT NEGOTIATED AND SIGNED: JUNE 1975 — JANUARY 1977

COUNTRY	DATE SIGNED	VENUE OF SIGNING	PRIVILEGES CONFERRED
Kingdom of Belgium	1st July, 1976	Brussels	Traffic rights for the designated airline of Nigeria to operate: — (a) Lagos-Madrid-Brussel-London-Scandinavian countries and vice versa. (b) Lagos Paris-Brussels-London-Scandinavian countries, vice versa. Traffic rights for the designated airline of Belgium to operate: — (a) Brussels-Casablanca or Tripoli or Tunis or Algiers Libreville-Lagos-Lusaka. (b) Brussels-Casablanca or Tripoli or Tunis or Algiers Kano-Libreville-Lusaka. Frequencies: once weekly on each route by each designated airline.
Republic of Mali	8th October, 1976	Lagos	Traffic rights for the designated airline of Nigeria to operate: — Lagos-Kano-Niamey-Bamako-Dakar-Conakry and vice versa. Traffic rights for the designated airline of Mali to operate:- Bamako-Niamey-Lagos-Libreville-Kinshasa and vice versa
Republic of the Ivory Coast	10th December, 1976	Lagos	Traffic rights for the designated airline of Nigeria to operate: —

			Lagos-Accra-Abidjan-Monrovia-Banjul 1 point in Europe and vice versa. Traffic rights for the designated airline of the Ivory Coast to operate: — Abidjan-Lagos-Douala-Brazzavile-Nairobi-Addis Ababa 1 point in Europe and vice versa.
Republic of Niger	17th December, 1976	Kano	Traffic rights for the designated airline of Nigeria to operate: — Lagos-Kano-Sokoto-Zinder-Niamey. Traffic rights for the designated airline of Nigeria operate: — Niamey-Sokoto-Lagos. Frequency: Once weekly on each route by each designated airline.

NEGOTIATED

COUNTRY	DATE OF NEGOTIATED	PLACE OF INITIALLING	RIVILEGES CONFERRED
The Scandidinvia countries: The Kingdom of Denmark The Kingdom of Norway Scandinavia countries	17th March, 1976	Lagos	Traffic rights for the designated airline of Nigeria to operate: — Lagos or Kano-Tripoli, Tunia, Dakar, Robertsfied, Rome Brussels, Amsterdam, London, Frankfurt, Points in Switzerland, Points in France, Points in Spain-Stockholm-New York-Kingston, vice versa. Traffic rights for the designated airline of the Scandinavian countries to operate: — Points in Scandinavia.

			Points in Germany (except Frankfurt) Points in Spain Madrid) Points in Austria Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Netherlands (except Amsterdam) Yugoslavia, Morocco, Tunisia, Points in Switzerland (except Zurich and Geneva) — Lagos-Lusaka, Libreville, Kinshasa, Luanda and vice versa. Frequency: Twice weekly for the designated airline of each of the four Contracting paraties.
Socialist Ethiopia	March/April 1976	Addis Ababa	Traffic rights for the designated airline of Nigeria to operate: — Lagos or Kano-Ndjamena, Khartoum, Entebbe, Kigali, Bangui, Kinshasa, Juba, Bujumbura, Nairobi-Addis Ababa-Cairo, Beruit. Traffic rights for the designated airline of Ethiopia to operate: — Addis Ababa-Nairobi, Entebbe, Kigali, Kinshasa, Khartoum, Juba, Bangui, Bujumbura, Douala-Lagos-Accra, Conakry, Rio de Janeiro. Frequency: Four weekly flights for the designated airline of each contracting party Type of Aircraft: B.707/720B or their equivalents.
People's Republic of Angola	7th June, 1976	Luanda	Traffic rights for the designated airline of Nigeria to operate: — Lagos-Douala-Luanda and vice versa.

			Traffic rights for the designated airline for Angola to operate: — Luanda-Libreville or Douala-Lagos and vice versa.
Islamic Republic of Pakistan	23rd July, 1976	Lagos	Traffic rights for the designated airline of Nigeria to operate: — Lagos or Kano-Kinshasa, Addis Ababa, Cairo, Jeddah-Karachi-Singapore and vice versa. Traffic rights for the designated airline of Pakistan to operate: — Karachi (or any other point in Pakistan)-Jeddah, Cairo, Khartoum, Ndjamena-Kano-Niamey, Accra, Freetown, Dakar and vice versa. Frequency: Twice weekly flights for the designated airline of each contracting party Type of Aircraft: Not above the B.747 or its equivalent.
Republic of India	24th August, 1976	Lagos	Traffic rights for the designated airline of Nigeria to operate: — Lagos-Aden, Jeddah, Cairo, Addis Ababa-Bombay or Calcutta. Traffic rights for the designated airline of India to operate: India (any point) — Aden, Nairobi, Cairo Tripoli-Lagos or Kano.

			Frequency: Twice weekly flights for the designated airline of each contracting party
Democratic Republic of Sudan	9th November, 1976.	Lagos	Traffic rights for the designated airline of Nigeria to operate: —
			Lagos or Kano-Ndjamena, Khartoum, Addis Ababa.
			Traffic rights for the designated airline of Sudan to operate: —
			Khartoum-Ndjamena-Kano.
			Frequency: Twice weekly flights for the designated airline of each contracting party.
			Type of Aircraft: Not above the B.707 or its equivalent.
Republic of Liberia	27th November, 1976	Monrovia	Traffic rights for the designated airline of Nigeria to operate: —
			Lagos-Accra, Abidjan, Robertsfield-Freetown Banjul, Dakar, New York.
			Routes to be operated by the designated airline of the Republic of Liberia would be agreed upon later prior to the signing of the Agreement.
Republic of Iraq	22nd December, 1976	Baghdad	Traffic rights for the desginated airline of Nigeria to operate: —
			Lagos or Kano-Cairo, Beruit, Damascus-Baghdad and vice versa.
			Traffic rights to be operated by the designated airline of Iraq: —

Baghdad-Jeddah, Khartoum, Ndjamena-Lagos or Kano and vice versa.

Frequency: Once weekly flight by the designated airline of each Contracting Party

ANNEX II

LICENCES ISSUED BY RENEWED DURING 1976

Airline Transport Pilots Licences	=	235
Senior Commercial Pilots Licences	=	15
Commercial Pilots Licences	=	311
Private Pilots Licences	=	95
Student Pilots Licences	=	70
Aircraft Maintenance Engineers Licences	=	233
Flight Engineers Licences	=	32
Validation of Flight Navigators Licences	=	2
Landing Cards issued/renewed	=	35

AIRLAW AND OTHER EXAMINATIONS

Airlaw Exams for Professional Pilots	=	81
" " " Private "	=	35
Navigation and Meteorology Exams for PPL	=	21
Radio Telephony Exams	=	12

ANNEX III

CANDIDATES ADMITTED INTO NCATC, ZARIA FROM 1973 TO 1976

COURSES	PERIOD			
FLYING SCHOOL	1973	1974	1975	1976
SP—6	18	—	—	—
FE—1	13	—	—	—
SP—7	—	25	—	—
MTP—1	—	5	—	—
MTP—2	—	3	—	—
PPL—1	—	5	—	—
AM—3	—	7	—	—

SP–8	–	–	4	–
MTP–3	–	–	5	–
SP–9	–	–	–	10
SP–10	–	–		12
AM–4	–	–	–	10
Nigerian Students:	31	39	17	24
Foreign "	–	6	2	8
Total =	31 +	45 +	19 +	32 = 127

AIRCRAFT MAINTENANCE SCHOOL	1973	1974	1975	1976
AE–7	19	–	–	–
AE–8('X' Electrics)	–	12	–	–
AE–9	–	–	20	–
AES–3	–	–	3	–
AES–4	–	–	3	–
AE–10	–	–	–	18
Nigerian Students:	19	12	26	16
Foreign "	–	–	–	2
Total =	19 +	12 +	26 +	18 = 75

ATS/COM SCHOOL (ATS)	1973	1974	1975	1976
AC–6	11	–	–	–
ACR–2	3	–	–	–
AC–7	–	–	12	–
AC–8	–	–	11	–
Nigerian Students:	14	–	11	–
Foreign "	–	–	12	–
Total =	14 +	– +	23 +	– = 37

ATS/COM SCHOOL (COMMUNICATIONS)	1973	1974	1975	1976
ACO–7	8	–	–	–
ACO–8	8	–	–	–
ACO–SP–1	4	–	–	–
ACO–9	–	5	–	–
TO–4	–	10	–	–
ACO–10	–	–	12	–
AO–3	–	–	11	–
ACO–11	–	–	–	9
TO–5	–	–	–	8
Nigerian Students:	16	14	22	17
Foreign "	4	1	1	–
TOTAL =	20 +	15 +	23 +	17 = 75

AERO. ELEC. & TELECOMS. SCHOOL	1973	1974	1975	1976
RM–6	12	–	–	–
TT–6	3	–	–	–
LSB–1	4	–	–	–
LSB–2	6	–	–	–
RE–5	–	13	–	–
ISB–3	–	6	–	–
RE–6	–	–	13	–
RE–7	–	–	10	–
ISB–4	–	–	5	–
ISB–5	–	–	3	–
RE–8	–	–	15	–
VOR–SEL–1	–	–	–	9
TT–7	–	–	–	4
VOR–SEL–2	–	–	–	6
Nigerian Students:	24	18	44	19
Foreign "	1	1	2	–
TOTAL =	25 +	19 +	46 +	19 = 109

GRAND TOTAL: NIGERIANS 383 +
FOREIGNERS 40
= 423

KEY TO ABBREVIATIONS

SP	Commercial Pilot (For CPL with Instrument & Multi-Engine Type Ratings)
FE	Flight Engineers Course
MTP	Multi-Engine Type Course
PPL	Private Pilot Course
AM	Aeronautical Meteorology
AE	Aircraft Maintenance Engineers Type II Course
AE	'X' Electrics: Aircraft Maintenance Engineer 'X' Electrical
AES	Aircraft Maintenance Engineer (Special) Course
AC	Air Traffic Controller (with PPL)
ACR	Air Traffic Controller Refresher
ACO	Aeronautical Communications Officer (Advanced)
ACO-SP	Aeronautical Communications Officer (Advanced) — Special
TO	Aeronautical Station Operator (Teletypewriter)
AO	Aeronautical Station Radio Operator
RM	Basic Radio Maintenance Technician
TT	Teletypewriter Maintenance
ISB	Independent Side Band
SSB	Single Side Band
RE (AET)	Aeronautical Electronics & Telecommunications
COR-SEL	Very High Frequency Omin-Directional Range

Published by the Information Division, Federal Ministry of Information, Lagos and printed by Citadel Printing & Publishing Co. Tel. 31776, 32959, Ikeja.