INTERNATIONAL COMMUNICATIONS UNION

4.05 I.T.U.

The Ministry of Posts, Telegraphs and Telephone is responsible for all the internal, international and maritime telegraph, telephone and telex operations, the technical maintenance of the radio broadcasting stations and the transmission of traffic for the meteorological and aeronautical services. In this capacity it provides services to the public and the Government, as well as to commerce and industry.

The telecommunication network of the Congo, installed during the years before independence, though extensive, was only adequate to provide the services needed at that time. About 300 expatriate technicians were engaged in the operation, administration and maintenance of the telecommunication services throughout the country. In the period immediately following independence most of these technicians left their posts, and in October 1960 there were only 24 in the field. Congolese personnel were trained and employed almost entirely at junior levels and were unable to cope with the operation and maintenance of the telecommunication equipment and services.

In response to the request for assistance by the Government of the Congo to the UN, a team of experts, composed of specialists from various member countries of the International Telecommunication Union (ITU) started arriving in August 1960.

4.051 The aims of the Programme

Until 1962 the main task of the ITU experts was to assist the Ministry in the performance of its responsibilities, to keep the telecommunication system in operation, and advise on the establishment of efficient accounting and business practices. This means that it was at first a purely operational programme to cope with an emergency situation.

It was only during 1963 that the programme was put on a wider and more usual basis aiming at assisting the Government. It has, however, to be added that, already in 1960, intensive training started, since both the Government and ITU realised at this early stage, that a permanent solution of the telecommunications problem is to be found in putting well-trained Congolese personnel in charge of the country's telecommunications service as soon as possible.

In the first sub-chapter the emergency period will be described and, in the second, the more elaborate programme now in execution will be outlined. Training will be dealt with in a further sub-chapter covering the whole period of assistance from 1960 until 1966.

4.052 The Implementation of the Programme between 1960 and 1962

At Central Government level, the Ministry of Posts and Telecommunications is responsible for all the internal, international and maritime telephone, telegraph and telex operations, as well as for the technical maintenance of the radio broadcasting stations and the transmissions of traffic for the meteorological and the aeronautical services. The ITU mission helped the Congolese authorities to overcome the initial difficulties which resulted from the disruption of the telecommunication services at the time of independence. Between 1960 and 1962 the main task was to keep the existing services in operation; subsequently progress was made towards the establishment of a normal programme of technical co-operation.

The first phase of ITU activities in the Congo started in August 1960 and was devoted mainly to re-establishing communications where these were interrupted, and to maintaining the existing network in operation. Nearly fifty experts arrived in the Congo with short-term

contracts, of an average duration of three months, and were immediately sent to different areas, where they started restoring damaged equipment or interrupted services. Approximately 300 Belgian advisers and technicians had left the country after the events of July 1960, and only a small number remained in Kinshasa. The ITU mission was confronted with a large technical task. Administrative and organisational matters had to be left aside for the time being. Experts were posted to the various telecommunications installations: the radio stations, telegraph and telex centres, telephone exchanges, airports and broadcasting stations. They were exposed on many occasions to personal risk, since some of the installations were located outside the safe areas. ITU's immediate intervention was made possible by the support received from various telecommunication administrations, and in particular those of Canada, Ethiopia, Federal Republic of Germany, Morocco, Switzerland and Tunisia, which made numerous members of their technical staff available to the UN.

The main long-distance telephone and telegraph circuits, internal and international, were kept in operation. The broadcasting transmissions were continued without interruption, thus permitting the Central Government to remain in touch, as much as possible, with the population throughout the country. The world's news agencies and papers were kept informed, directly from Kinshasa, by means of the telex system, and through direct broadcast reports about the situation in the Congo, almost on an hour-to-hour basis, without one single day of interruption. The telephone exchanges in the main cities were kept in operation also without interruption. Delays occurred only through the massive overload of traffic for which the installations were not originally designed.

Major equipment requirements, which had been the subject of lengthy negotiations, were taken care of when the Federal Republic of Germany, in July 1962, gave its final approval for supplying one million dollars worth of equipment needed to link the various telecommunications centres in the Congo with automatic error-correcting high speed telecommunications circuits. The planning and implementation incidental to the installation of this equipment was carried out jointly by the ITU, the Congolese authorities and the Government of the Federal Republic of Germany.

A construction group was set up at the Telecommunications Directorate headed by one of the ITU experts, who worked in close co-operation withthe responsible Congolese officials. Several other members of the ITU mission were helping with the preparations. Arrangements were made to airlift about forty tons of equipment from Europe. The project involved :

- the installation of transmitters, construction of new antennae, installation of new receivers in existing stations, of air-conditioning systems and construction of new telex and automatic terminals;
- the interconnection of the main regional centres — Kinshasa, Lubumbourg, Mbandaka, Kisangani and Bukavu — with a high-speed telex system, improved radio-telephone communications and an efficient telegraph service;
- the provision of special circuits for the aeronautical point-to-point services as well as for the speedy transmission of meteorological information.

The Congolese Telecommunication Administration was not ready in 1960 to absorb organised technical assistance, provided in the regular

way by the United Nations, mainly owing to the confusion existing within the services, but also because of the general political situation.

Attempts were made to integrate the mission at the policy-making level within the Congolese Telecommunication Administration in order to accelerate the implementation of a technical assistance programme, but this proved to be impracticable at the time, and integration could be effected only at the technical, operational level. Meanwhile, the ITU mission continued with the preparation of a programme which would respond to the needs of the Congo in this field, but no advisers for the policy posts were recruited. In view of the circumstances, a flexible emergency programme was applied, as described above, which was to permit later a gradual transition into a regular technical co-operation programme. This conversion of the operational programme into a substantial development and training programme, designed to provide lasting results in the Congo, was started at the end of 1962.

4.053 The Implementation of the New Programme

4.0533 Advisory Services

During the period under review it has not been possible to integrate fully the advisory experts into the policy-making level of the Ministry. The co-operation has, however, been considerably improved.

From August 1964 until October 1965, a serious difficulty was encountered when the portfolio of the Minister of PTT was in the hands of the Prime Minister. Though this had certain advantages, the frequent unavailability of the Minister for urgent, as well as routine matters,

handicapped the operation of the Mission. The PTT Secretary-General was also frequently out of the country, and many decisions had to be referred to the Prime Minister with consequent delays.

In 1963 the advisory experts were thus mainly concerned with the establishment of plans for the long-term development of secondary telecommunications networks to serve the new provincial capitals and other major centres, with connections to the primary network, and similarly the auxiliary network serving the smaller centres; the expansion of telephone exchanges; the improvement of radio-broadcasting equipment; and the provision of monitoring stations for the measurement and control of radio emissions.

During the first half of 1964 an ITU expert, assigned to the Ministry of Information completed his task of preparing a project for the design of a new broadcasting studio. This project was presented in book form to the Minister of Information.

Although several discussions took place between ITU and the officials of the Ministry of Information, there seemed to be reluctance to accept a high-level adviser, perhaps due to the fact that there was no Minister permanently in office. Unfortunately, the situation did not improve during the first half of 1965. Due to lack of experts and delay in recruitment the ITU mission was not able to supply any full-time experts. One expert, however, ~~in~~ paid 10 visits per week to the studios. In spite of this short time, he was able to make a valuable contribution by assigning work to the studio technicians. A considerable amount of studio equipment has thus been reconditioned and put in service either in Kinshasa or in the provinces.

During 1964 the following personnel were engaged in advisory work with the Ministry of PTT, mainly assisting the Director of Telecommunications during the period up to 30 June, and the Secretary-General of

PTT after that date. One ITU expert gave advice on the various radio communication problems, especially on the design and construction of antennas, and another advised on the installation of the telex, leased-circuit and telegraph equipment. A further expert gave advice to the newly formed Bureau of Technical Studies on the design of secondary radio communication to be established during the next investment period. Assistance was rendered to the Department of Exploitation in the setting up of a frequency management office with all records of radio operations, etc. During the latter part of the year, planning difficulty was encountered at the new N'Djili Radio Transmitting Station and, as no ITU antenna experts were available, a request was made to ITU Headquarters for the short-term loan of one. In response to this request, the Senior Counsellor of the International Radio Consultative Committee, paid a visit to the Mission from 26 November to 14 December, as a result of which it was expected to transfer all radio broadcast and communication transmitters from the old BEAM station to N'Djili.

During the first part of 1965 two ITU experts completed the project for the secondary radio communication network. Another expert assisted the Director of PTT to plan and study certain microwave and tropospheric scatter links. A project for the completion of the primary interurban network and the secondary interurban network was completed by two experts. Both plans were prepared in a form suitable for presentation to possible sources of finance and were taken by the PTT Mission to Europe.

The Chief of the ITU Mission in the Congo acted as adviser on Telecommunications to the three Ministers who held the portefolio of Posts and telecommunications during the year 1965; In June he accompanied the Under-Secretary to the Ministry of PTT, at the latter's request, on a mission to Europe, and acted as his adviser in discussions with

representatives of the European Economic Community (Common Market), with members of the French Ministry of PTT and with German manufacturers of telecommunications equipment.

The training adviser worked on the preparation of a statute to establish a Telecommunications School and advised the Ministry of PTT on the formalities involved in presenting a request, dealing with the School, to the United Nations Special Fund.

The Telegraph Development Expert advised on the development of the telex service and the planning of expanded telegraph services in Kinshasa, the Bas-Congo area and Lubumbashi. He drew up detailed final plans for the Bas-Congo and Lubumbashi.

An operational and maintenance expert advised on the expansion of radio services. Three preliminary plans were drawn up, covering the primary, secondary and auxiliary radio networks.

Two Telephone Development experts advised on the expansion of the automatic telephone network in Kinshasa. A 20-year development plan for the Kinshasa telephone system with full specifications and network planning to cover the first five years was prepared and handed to the Ministry. A connection plan for the Bas-Congo area was made and the specifications for equipment were included in it.

The Mission began to prepare a detailed survey of the capacities and needs of the telecommunications system in the Congo, and of the present method of operation. This survey is expected to be of value to the Government for a number of years.

An expert in high frequency broadcasting and high power transmitters, arrived in August 1965, after some months of negotiation. He advised the Ministry of Information on the rehabilitation of provincial broadcasting stations. Under his supervision, transmitters in Bukavu, Kisangani and Lulimbourg are being restored to a more operational condition.

The Ministry constantly called on a Swiss expert who assists in operating the Kinshasa studios, for advice on planning and choice of equipment.

In October 1965 the Prime Minister handed the PTT portefolio to the sole charge of one Minister. This situation remained throughout 1966, thus the task of the ITU Chief of Mission was made potentialy easier. Cases of inconvenience and delay fell in number.

In 1966 the Telegraph Development expert in the telegraph planning office was able to report several projects brought to a successful conclusion. He also participated in the preparation of the investment budget of the new five year plan.

The ITU project for the development of the telephone network of Kinshasa was adopted by the Council of Ministers on January 26th 1966 and ordered to be put out to open tenders. This decision was later modified by letter dated February 7th, 1966, the Head of State instructing the Minister to negotiate with a single company.

One Operational and Maintenance expert was requested to act as Chief of the Radio Section due to the transfer of the previous chief to the Cabinet of the President and the departure of his deputy on a fellowship to Europe.

The same expert participated in the preparation of the investment budget and thework on the five year plan. Attempts were made to compile up to date information on all radio stations within the country.

Another expert continued his task of organising the radio monitoring section.

He prepared a course for the "monitoring station personnel". The course began on 4.7.66.

4.0532 Operational Services

4.06321 At the Ministry of PTT

In 1963 the Government began by implementing the plans, drawn up with the assistance of the ITU mission, for the expansion of existing telecommunications services. As already mentioned, equipment for these services was given by the Federal Republic of Germany to link the regional telecommunications centres in the Congo with automatic error-corrected high-speed radio-telegraph circuits as well as improved radio-telephone circuits. Construction groups, comprising experts from the Federal Republic of Germany, experts from ITU, and Congolese personnel were set up in Kinshasa and regional centres for the installation of the equipment and to instruct other Congolese personnel in its operation and maintenance. This has been a major undertaking involving not only the installation of complex electronic equipment at 15 separate radio centres and telegraph terminals, but also the revision and upgrading of associated equipment and facilities, such as cables, antennae and radio-telephone terminals, as far as the final problems of telegraph delivery services. Concurrently an intensive staff-training programme has been maintained at the various centres in the Congo, at the "Ecole Nationale des Télécommunications" (ENT) in Kinshasa, and abroad under fellowships given by the Governments of France and the Federal Republic of Germany and the United Nations (1).

The commissioning of this equipment enabled the connection of Mbandaka, Kisangani, Bukavu and Lubumbourg with the world telex network and thus brought about a major improvement in the handling of commercial correspondence from subscribers and for the public in general. Air-travel safety in the Congo and in the whole of Central Africa was improved as a result of the new error-corrected circuits carrying meteorological and aviation information. Governmental communications were also improved

(1) See sub-chapter 4.054 to the present chapter, p.

through the direct teleprinter services provided between the Ministry of the Interior of the Central Government and the Government offices at Mbandaka, Kisangani, Bukavu and Lubumbourg. In addition, the public benefits generally from the telex service and also from the improved handling of telegrams and telephone services. The joint efforts of ITU experts, German Aid and the Congolese Government were mainly responsible for the success of the following inaugurations which have symbolised the development of the PTT internal and external communications.

Inauguration of the main part of the German Aid equipment by the Prime Minister, 14 April 1964.

Inauguration of the first direct telegraph circuit and the first direct radio-telephone circuit Kinshasa-Lagos by Prime Minister, 27 February and 27 August 1964.

After the completion of this important stage of development in early 1964 the following operational services have been rendered:

ITU experts, assisted by installation staff of the manufacturers, completed the installation of the Siemens radio communication equipment supplied by German technical assistance. This involved the design and installation of antennas and power supplies. Two experts assisted in the maintenance of the transmitters in both the ESAN and the N'Djili stations. Both experts carried out special missions to Kisangani, Kolwezi, Lubumbashi and Bukavuga in connection with the maintenance of radio equipment.

With ITU assistance the installation of a modern radio monitoring equipment at the Binza radio receiving station was completed. This equipment was mainly furnished by the ITU Mission funds as being essential to the control of the transmissions of the Ministries of PTT and Information, as well asthose of more than 1,000 other transmitters in the Congo, some of which are receivable in Kinshasa. The equipment, consisting of radio receivers, tape recorders, frequency measuring equipment and

band-oscillograph-recording-equipment, field strength meter, etc, was supplied at a cost of approximately $13,000.

Four ITU experts carried out maintenance work in the various provincial centres during the year. Considerable support was provided in the form of instruments and spare parts ordered through ITU and transported by UN aircraft.

Another ITU technician was active in repairing VHF radio equipment in Lubumbashi and installing radio equipment for the meteorological department. He continued with the installation of radio receiving equipment for the meteorological service throughout the first half of 1965.

During 1965 ITU experts were active in the main technical sections as follows:

Kinshasa

Two Radio experts continued their work at the two transmitting sites in Kinshasa: BEAN and N'Djili. This work consisted of routine maintenance, transfer of large (10 KW) transmitters from BEAN to N'Djili, and providing assistance in the testing of the two large transmitters supplied by Belgian bilateral aid.

There was difficulty in replacing the German expert in radio monitoring, and his government obliged by requesting him to return to the Congo in November. His task on arrival was to complete the plans for the installation of radio monitoring stations in Kisangani and Lubumbashi.

Telecommunications

The expert who departed in April, divided his time between the installation and maintenance of radio equipment at the Meteorological Service on the one hand, and on the other, the reorganization of the Telecommunications laboratory. His replacement took over the work

of reorganising the Telecommunications Laboratory and the training of staff. With the newly trained staff he was able to recondition several very expensive test and laboratory instruments. He also successfully overhauled and put back into service the terminal equipment of the Kinshasa-Brazzaville cable.

Radio Provincial Centres

In May, an expert was posted to Bukavu, where he assisted the Ministry technicians in the maintenance of radio equipment in Bukavu, Kindu and Goma. Short missions for radio maintenance were made to provincial centres by two other experts.

Kinshasa and Bas Congo Area

For the first part of the year, only three experts, from those promised under the German Aid programme were occupying their posts.

Two of them continued their tasks of improving the telex and automatic telegraphy service in the Bas Congo area, from Kinshasa to the coast, following the river. A 24-channel high frequency telegraph link between the Ministry of PTT Bas Zaire and the Radio Bureau Protection (RPR) at N'djili airport was reconditioned and installed.

The third was transferred at the end of 1964 from Bukavu to Kinshasa. During the year he made several missions to Kikwadis and Lubumbashi. On the arrival of the other German experts, he was transferred back to Bukavu.

The other German aid mx experts, arrived in August and November. Particular efforts were made to complete the installation work in the Bas Congo area and to bring the equipment in Kinshasa to a high standard.

Two experts from Switzerland worked on the development of sub-

telegraph offices in Kinshasa and the establishment of centers in the Bas Congo.

The following sub-telegraph offices in Kinshasa were established or equipped with teleprinter equipment, and put into service: Dendale, Bumbalungwa, Kinshasa, Limete, Mateta, N'Djili, Lac II and Kalina.

The following telegraph circuits were put into service outside of Kinshasa: Telex service between Kinshasa and Thysville, Public telex cabin at Thysville (inaugurated October 12th), Public tele-printer service between Kinshasa and Inkisi, and between Inkisi and Thysville.

A survey of the operation of the telegrams service in Kinshasa and Bas Congo area, and a detailed report with proposals for the improvement of the service were made. These proposals are now being studied by the Telecommunications Directorate.

An ITU expert was in charge of the Teleprinter maintenance for the first six months of the year. He was replaced by a German expert in August. The latter was charged with establishing a workshop under the Telecommunications Directorate that would be capable of overhauling all the teleprinters in the Congo. As no space was available in the buildings, an isolated dwelling house owned by the Ministry of PTT at Kingabwa was purchased for conversion into a workshop. The workshop was completed during the first quarter of 1966.

Provincial Centers:

Two missions were made to Lubumbourg, and one mission to Bas Kisangani.

One expert made one mission each to M'Bandaka and Kisangani, and was then transferred to Bukavu.

He also increased the number of circuits between Bukavu and Goma, using a VHF radio link.

The Telegraph Development expert prepared on the spot, the plan for the development of the Lubumbashi area telex service, including transfer of the telex exchange to another location. The work is being carried out by an expert who was assigned to Lubumbashi for this purpose. A German Aid expert also visited Lubumbashi to give assistance.

An expert accompanied by officials of the "Services des Exploitations", made surveys of the telegraph services in Bukavu, Goma and the Bas Congo. Reports on these missions were submitted to the PTT Ministry.

On 12 October 1965, a public telex service, installed with ITU assistance, was inaugurated in Thysville by the Mayor of the town.

Telephony

During the year two ITU experts supervised and gave assistance at the Kinshasa exchanges. One produced a maintenance chart and roster which the Ministry accepted, but, through personnel difficulties, did not fully implement. However, a considerable improvement in the operation of Leo I exchange was effected. The other concentrated on the satellite exchanges, the interconnecting circuits and power supplies. Here again, many long existing faults were cleared. In addition, he made telephone maintenance missions to Bukavu and Lubumbourg, where he cleared faults, both at the central exchanges and at PABX installations. At all places instruction was given to the technical staff.

A French expert who was transferred from the Technical Assistance Board in August, commenced work at the Leo I exchange and at the same time conducted a refresher course for certain technicians who were leaving for France on study missions. He resigned in November in order to join the French bilateral aid mission in the Congo.

An expert dealt with the maintenance of private automatic branch

exchanges i.e. PABX's in Kinshasa. He made one mission to Bukavu during May 1965.

An ITU expert was responsible for the circuits in the Bas Congo area. This involved:

(a) the overhaul of the surface line between Thysville and Matadi, including moving of the pole route for more than 10 km of the line.

(b) the checking and maintenance of the underground cable between Kinshasa and Thysville (Cattior).

During the year, progress was made with the plan for installing a single PABX for use of the Government offices in Kalina. A network plan was prepared for such a PABX, and also conducted courses in the Telecommunications School on cable installation and maintenance from April to December.

Several reports on the present state of the telephone service with proposals for the improvement were made by the telephone experts and presented to the Ministry of PTT.

In 1966 the large volume of operational assistance continued.

The Cable expert continued to supervise the maintenance work on the cable and open wire line Kinshasa to Matadi and was responsible for the rehabilitation of the open wire line between Banana and Moanda. Beginning 1966 this ITU expert handed over the cable jointer course to a French bilateral aid expert. This permitted him to effect missions to Bukavu and Goma to check the cable network and study the possibilities of extension of telephone network.

The Auto-Telephony Development expert was occupied with the maintenance and repair of the PABX equipment within Kinshasa. His main task was the installation of a 6/50 private automatic exchange in the office of the Prime Minister.

He was also able to have a group of graduates from the School of

Telecommunications to train on repair and maintenance of PABX.

Another Telephony expert was working in Kinshasa, Matadi and Kikondja. He arranged certain urgent repairs to the power supply circuits to the Leo I Central. He carried out a mission to Matadi and Bas-Congo in order to localise and rectify faults in the Matadi exchange and network. Together with the Auto-Telephony Development expert he prepared a detailed project for the improvement of the telephone faults clearing and long distance telephone services.

Two Radio experts continued their work at the two transmitting stations, N'djili and Boma.

Laboratory

The Radio expert continued his work at the PTT laboratories except for a short period when he worked with an Auto-Telegraphy expert on the open wire carrier equipment in Thyswille. He also installed a radio teleprinter for the office of the Interpol in Kinshasa. In his normal work this expert has been assisting in the checking, adjusting and distribution of 12 small additionalpowered SSB transreceivers by the Ministry of PTT for their auxiliary network. He also gave courses in measuring instruments to groups of 3 or 4 technicians who were sent to the laboratory for training.

Two German Aid experts continued to supervise the repair and maintenance in the Kinshasa MUX Room. However, the task was made difficult in the first quarter of 1966 when ten of the experienced telex switchboard operators were transferred for political reasons to other sections. There was a brief period when the service was in chaos as the replacement operators were un-trained, and it has not fully recovered. A second problem has been thepromotion and transfer of three technicians and notice that four more are to be transferred. Special meetings were

requested in order to save the situation. The situation at the NEX has been now clarified.

In the sphere of teleprinting progress was made in the setting-up of the Central Teleprinter Workshop. Inspection trips were also made to all centres in the Congo (Elisabeth, Kisangani, Bukavu, Lubumbashi) to survey all teleprinters and similar equipment and to prepare a list of all requirements.

In the Provinces

The following activities have taken place:

Bas-Congo

Three experts completed various work on the Bas-Congo network, including the connection of the telex subscribers in Boma and the installation of a salvaged 3 channel carrier equipment between Boma and Matadi.

Elisabeth

Routine visits, maintenance, repairs of telephone, telegraph and radio equipment by three other experts.

Kisangani

Missions were carried out by a Radio expert for repair and maintenance of transmitters. An Auto-Telegraphy expert checked the maintenance of the Hmx and Telex equipment.

Lubumbashi

General maintaining of transmitter (broadcasting)

Bukavu

Two experts are stationed in Bukavu. Their main tasks are super-

vision, maintenance and repair. Radio and telephone equipment repairs took place.

Lubumbashi

An expert is busy for the relocation of the Rux Room and the checking of the broadcast transmitters.

Some noteworthy achievements in 1966 are :

The Telex service has greatly improved and the leased circuits are functionning.

Kinshasa monitoring station has increased its activities and has carried out some constructive work both for the Congo and for the IFRB.

The preinvestment study for the development of the telecommunication network in the Kisangani and the inventory of teleprinter spares have been completed. The specifications for voice frequency telegraph equipment for Kinshasa, Lubumbashi and Bukavu have been drawn up.

The telex service to Brussels was improved but difficulties still exist with Lubumbashi. The Ministry of Interior leased circuits are now all functionning and the circuits to Bas-Congo were improved considerably.

Since the end of February telex subscribers in Boma (an important port) have been connected to the national network.

In November the foundation stone for a telephone exchange in Kalina was laid. Eventually this will service the Ministeries and Governments requirements and thus unburden the present central exchange.

A.05322 At the Ministry of Information

In 1964, at the Ministry of Information in Kinshasa an ITU expert

worked in the studios and studio equipment workshop to supervise the maintenance of equipment and the construction of additional studios. Considerable material help was supplied during the year in the form of electronic tapes, spare parts, pick-up heads, etc. The value of equipment ordered or received for the studios during the year was $4,500.

ITU also assisted the studio programme staff in the actual recording or broadcasting of their programmes.

Another expert was in charge of maintenance of the studios in Lubumbashi. The expert left in early July, and the provincial Director of Information stated that there was no necessity to replace him.

In 1965 no ITU experts were working in the Ministry's studios at the beginning of the year, owing to difficulties in recruiting this type of expert. However, in February, an expert was assigned to the Ministry of PTT and attended the studios two days a week.

An expert in broadcasting transmitters, arrived at the end of July 1965, and began the programme for rehabilitating all the broadcasting transmitters by working on those in Lubumbourg, Kisangani and Bukavu. He continued his studies, in 1966, of the maintenance and repair of transmitters in Kinshasa, and paid several visits to Lubumbourg, Mbandaka and Bukavu.

A Studio technician, arrived in July 1965 and took over the studio work. He carried out maintenance work in the studios and at the same time trained technicians from Kinshasa and others from the provinces who had been sent to Kinshasa specially for this training.

Close cooperation was maintained with ORTRA (Office de Coopération Radio), an Aid Organization of the French Government which was involved in Studio management and the setting up of a television network in the Congo. The organization supplied the Ministry with materials, mostly

tools and electronic tubes to the value of $4,000.

During the evening of the 23rd of November 1966, the Congolese Television Service was officially inaugurated by the Head of State.

4.05323 Personnel - Further Development of the Programme

During the last six years the following maximum number of experts per year have been made available by ITU:

Year	Number of Experts
1961	14
1962	27
1963	33
1964	39
1965	20
1966	16

The general security situation in the country has now vastly improved and commercial, industrial and administrative activity has started to develop. In order to keep pace with this development the telecommunication services has to make a very great effort. The Ministry of PTT has to reorganise itself. Also the Ministry must receive considerable amount of technical assistance, not only in the technical fields but also in the administrative branches. According tothe 1965/66 Technical Assistance Program the strength of the Mission will be sharply cut after thecend of 1966. Therefore, the Mission made every endeavour to fill the vacant posts which were allocated for administrative experts, so that the groundwork for a logical reorganisation could be made well before the end of 1966. Until now, much work could not be carried out because of lack of foreign

currency. It seems that foreign currency should be more easily available and so the quantity of work should increase rapidly. The same situation exists with the general security of the nation. Until now it has been impossible to consider sending experts to more than a few locations, but soon ITU will have floods of request to send out experts to localities whose telecommunication facilities have been neglected for some time.

Nevertheless, the Mission plans to use its personnel in the most effective manner possible and trusts that the internal security will permit a considerable proportion of its staff to be posted outside of Kinshasa in the future.

As mentioned in the body of this report, the Mission has helped the Ministry of PTT prepare several projects, some of which began to be implemented during 1966. Naturally during this implementation a bigger burden is put on the Mission especially during the period of installation. This in turn created the situation of a lack of accomodation which has slowed up recruitment. The Ministry of PTT promised to supply some accomodation, but nothing has been done so far.

A.054 Training

Already at the biginning of the implementation of the ITU emergency programme for restoration and maintenance of the telecommunications service, training was considered to be an equally important issue. Attempts were made by the experts to impart emergency in-service training to the Congolese technicians who had started to provide additional help to the Congolese Telecommunication Administration after the sudden departure of large numbers of European technical personnel. It was recognised that every effort would have to be made to provide for large-scale systematic training of Congolese personnel at all levels

to enable them to take over gradually the duties performed earlier by foreign personnel, whether Belgian or those supplied by UN. Local training meant the establishment of special schooling facilities with teachers and adequate equipment. The recruitment of teachers required time; it was also necessary to obtain buildings and transportation. This presupposed, however, a more settled situation and means that were then virtually non-existent.

4.0541 The National School of Telecommunications (Ecole Nationale des Télécommunications - ENT)

In order to make a start on local training, in January 1962 a small school, the subsequent National School of Telecommunications, was established in a building used for offices by the UN, while awaiting funds and equipment for the large-scale training institution which was to be established later on. Funds were obtained from local sources to improve buildings which belonged to the telecommunications authorities in Kinshasa. Work on these started in November 1962, and by the end of the year some students were already in training, under the guidance of four teachers recruited under the ITU programme. From 1963-1965 the school was running with a capacity of some 100 students. Table I below shows the number of students who have successfully completed their courses in 1965; and table II indicates the number of teachers who were engaged in teaching during the last six years.

Table I

Training as	Commenced	Ended	Successful Students
Technicians	Sep 1961	June 1964	(14 telephonists (5 telegraphists
	Sep 1963	Aug 1965	(20 radiotechnicians (22 telephonists
Operators	June 1963	June 1964	26 operators
Jointers	Sep 1963	July 1964	13 jointers

Table II

Year	Number of Teachers	Provided by
1961	1	Belgian Technical Assistance
1962	4	ITU, International recruited
	1	UNESCO
1963	4	ITU, Internationally recruited
	2	Belgian Technical Assistance
1964	5	ITU, Internationally recruited
	2	Belgian Technical Assistance
1965	4	ITU, Internationally recruited
	3	ITU, locally recruited; part-time
1966 (E.S.P.T.T.)	3	ITU, Internationally recruited
	14	ITU, locally recruited; part-time

Present needs for trained personnel, taking into account the serious shortage which has existed since 1960 and which has still not yet been overcome, are roughly estimated at 20 engineers, 60 senior technicians, 450 technicians, 500 assistant technicians (operators), 200 jointers and linemen, and 150 administrative staff. The telecommunication personnel available as of January 1965 included one engineer, 100 technicians, 200 assistant technicians and 25 jointers and linemen. The Government plans to provide engineers by training them in foreign and/or Congolese universities, but the major need is for personnel at the sub-university level.

To meet these pressing needs, the Government, in collaboration with ITU, elaborated a project in 1964 for extension of the National School of Telecommunications (ENT). This project was submitted to the Special Fund and includes the following aims:

The school is to train senior technicians (inspectors), technicians

(controllers), assistant technicians (operators), jointers and installers, technical administrative personnel and other technical staff in the Ministry of Posts and Telecommunications.

a. Senior Technicians - Students are recruited from among sixth year secondary school graduates (twelve years of schooling). Following a six-month common course, the senior technician students would take a three-year technical course which could include a general knowledge of the entire range of telecommunication technique encompassing an advanced level and with more emphasis on mathematics than that given to basic grade technicians. Six months of practical training would follow after which the students would be graduated as inspectors.

b. Technicians - Students are recruited from sixth year secondary school graduates. Following a six-month common course, the students would take a one-year course which would consist of the four following fields: general and automatic telephony, telegraphy including telex, radio communications and transmission and cables. Six months of practical training follows after which the students would be given controller certificates.

Because a sufficient number of secondary school graduates is not expected to be available until 1967 or thereafter, a transitory programme is foreseen duringthe first two years of the project during which the school accepts students by examination after four years of secondary school and offer a two-year training course followed by six months practical training. Depending upon their ability and future training, these graduates would eventually qualify for positions in (a) or (b) above.

c. Assistant Technicians - Students are required to have four years of secondary vocational schooling. They take a one year course which trains them to become operators and repairmen. After two months practical training, they would be graduated as assistant technicians.

4. Tradesmen and Semi-skilled Workers - This category includes cable jointers, telephone installers, etc. Students are required to have completed two years of secondary school and then take a one-year practical course. They graduate after two months of training in the field.

c. In-Service Employees - Present employees are admitted to study any of the above-mentioned courses provided they can satisfy scholastic requirements and pass entrance examinations. In particular, a number of present technicians are admitted for the senior technician course.

Until 1967 it is proposed to take only students already in Government services. From 1967 onwards, it is expected that the students will be both Government employees and students recruited by examination from the various technical schools already in the Congo. It is estimated that 15 senior technicians will graduate annually starting 1969/70, an average of 30 technicians will graduate annually starting 1966/67 and about 20 jointers and installers will graduate annually starting in 1965/66.

The status for the National School of Posts and Telecommunications was promulgated by Ordinance 66/275 of May 2nd 1966. Since that time the "Conseil d'Administration" for the School has been established and has met three times. The "Conseil" has not been able to do effective work in view of the fact that the Special Fund Project is about to be implemented. However it has taken several necessary administrative decisions.
The Plan of Operations has been approved by the Ministry of PTT with slight modifications and has been sent to Geneva for final presentation.
The list of candidates including that of the Project Manager has been approved by the Minister of PTT and by the Technical Assistance Coordinating body of the Government. This coordinating body is now the High Commissioner for National Reconstruction.

Eight of the nine posts foreseen in the Plan of Operations are now filled by experts either already recruited or in the process of being recruited.

Project Manager - Under recruitment
Radio Instructor - Present
Radio Instructor - Under recruitment
Telephone Instructor - Present
Telephone Instructor - Under recruitment
Telegraphy Instructor - Under recruitment
Transmission Instructor - Under recruitment
Electrotechnique Instructor - Under recruitment

The Construction of the new classroom and laboratory buildings, the administration building and the workshops are to all intents and purposes completed and should be ready for occupancy before October 31st. The classroom and laboratory building consists of twelve classrooms and a radio operating room and language laboratory all on the first floor. On the ground floor we have a library combined with an assembly and film projection room, four telecommunication laboratories, an electrical laboratory and a draughting office.

The administration block consists of 15 offices and instructor room.

The workshops block consists of three large workshops space plus an office and stores. Furniture for the classrooms and offices are under construction and will, it is hoped, be ready during October. The second stage of construction involving the internal and refectory will probably be commenced this year and completed by the end of 1967.

Classes for 1965/66 school year

1. Telecommunication Technician Course

A class of 48 students were recruited in October 1965 for a two year telecommunication technician course. In spite of all efforts the recruiting level, though nominally 4 years post primary, was poorer than had been expected. Consequently 8 students had to be dropped after the first semester and 10 after the final examination of the first year.

2. Telecommunication Mechanics Course

2. Telecommunication Mechanics Course

This course took place between 22 February 65 and 24 September 1966 (including 1 month job in the offices) and was attended by 7 of the 8 students who were dropped after the first semester of the technician course.

In the final examination six were successful.

3. Radio Operator Course

This course took place between 15 September 1965 and 24 September 1966 and was attended by 25 students of which 20 were successful in the final examination.

4. Cable Jointers Course

This course took place between 15 September 1965 and 24 September 1966 and was attended by 25 students of which 24 were successful in the final examination.

5. Female Telephone Operator in-service training Course

This course took place between 24 January 1965 and 30 April 1966. The class consisted of 24 operators all of whom completed the course satisfactorily.

6. Radio monitoring in-service training course

This in-service course took place between 5 July and 22 August 1966 and was attended by 26 technicians of which 24 successfully completed the course.

Classes for 1966/67 school year

The 1965/66 group of students technicians now numbering 30 are beginning their second and final year. They are being separated into three groups (telephony, radio and telegraphy). The recruitment procedures for the first year technician class have been completed and the 50 new students reported at the School on October 15th. Similar steps were also taken to recruit 25 students for a radio operator course

and 25 for a cable jointer course. Both these courses commenced in October.

Sources of recruitment - See Appendix I attached

Transport - The Resident Representative (UNDP) has decided to give to the School, on long term load, the three vehicles at present in use by the School on condition the Ministry takes full responsibility for their operation. The mission is exploring ways with the School co-Director to implement this agreement. This agreement in effect secures the School of necessary student transport until the internat is completed. The vehicles comprise a 30 seat Bedford passenger bus, a 3 ton Bedford truck equipped withbenches and a Volkswagen min-bus for the use of the ITU teaching staff.

International staff other than ITU. There are four instructors at the School financed by French bilateral assistance : an instructor of radio, an instructor of telegraphy and an instructoraf telephony and an instructor of French. The candidature for the Special Fund post has been filled. In addition to the French instructors there is one Belgian full time instructor who is employed as a laboratory assistant.

The School has been able to obtain the services of 5 teachers for general subjects from outside of the Ministry.

Congolese counterpart staff

The Congolese counterpart staff have not yet been chosen but it can be said that certain action has been taken. One Congolese who has had several years experience in the Ministry of PTT and who has completed two years university training at the Lovanium University of Kinshasa leaves this October for Paris to complete his university education. He will be available to the School on his return. In the school at present there are three assistant instructors who have successfully passed the Inspecteur course at the School of PTT Paris. They have shown an aptitude

for teaching. There are also seven assistant instructors engaged as laboratory assistants and demonstrators.

I.T.U. Staff

There are now three ITU instructors fully employed at the School and one part time. The sad death of the senior training adviser and acting Project Manager was a blow to the School. After consultation with the Minister another ITU instructor was informed tonat as senior training adviser pending arrival of the Project Manager. This step was essential as the School has reopened and there is considerable work establishing time tables and programmes and for general supervision.

Comments

The School has been requested to train army personnel. During 1965/66 there were a total of 8 soldiers in the various courses and in 1966/67 an additional 13. There will be 18 during 1966/67 (3 finished a lower level course). It has been noticed the army personnel tend to disturb the rhythm of the School and often their standard is below requirements.

Placement of technicians on completion of the courses. There has been no problem in the placement of technicians after graduation from the School. All graduates are automatically absorbed by the Ministry. The problem has been the recognition of the certificates granted by the School. These certificates are now recognised and are now given a temporary salary until their dossiers have been dealt with by the Minister of Fonction Publique .(Please refer to Appendix II attached - holders of diplomas.

4.0542 Other Courses - Fellowships

In addition to the longer term courses, a series of refrusher courses for period of two to three months were given at the ENT since it ceas-

into existence.

From September 1964 to June 1965, 20 police operators were successfully trained at EPT.

Considering the urgent needs for trained technical staff, a massive foreign training programme was suggested by the ITU mission, which could be undertaken most expeditiously by sending well selected candidates to obtain specialised training at the installations and training centres of some foreign administrations. In 1962 several telecommunications administrations, thought likely to provide the necessary facilities within a short time, were approached with this idea. Thus, at the end of 1963, 28 students were studying radio-communications in France, and 24 had completed their studies,— 19 in automatic telegraphy systems and 5 in Radio transmitters and receivers— in the Federal Republic of Germany. In December of the same year, a further 18 technicians began an 18-month training in radio-communications in France.

One senior fellowship was granted by the UN to the "Directeur Chef des Services" for study in telecommunication and ~~xxxx~~ administration.

Three out of the five EPTA fellowships planned were granted by the end of 1964, although it was not possible for the students to take up their studies abroad until 1965.

In 1964, through French bilateral aid, 26 Congolese were enabled to study in France in the telecommunications field.

a. <u>Completed</u> (EPTA financed)

1 for 12 months	Automatic Telegraphy	Germany
1 for 3 months	Frequency Management	Switzerland Germany
1 for 3 months	Frequency Management	Switzerland Germany
1 for 3 months	Frequency Management	Switzerland Germany

b. Under preparation (ITU financed)

5 for 3 months	International Telephony	U.K.
1 for 12 months	Automatic Error correction	Germany

An ITU fellow (1965) came back and was appointed at the "Direction des Exploitations".

In addition tothe various formal training courses, in-service training was given by operational staff. As an example, in 1964 twenty-seven technicians benefited from this arrangement.

A.055 Relations to other programmes

Already in the preceeding text the links to the numerous forms of bilateral assistance, the Congolese Government and other UN Specialised Agencies has been mentioned, and it can be stated that the cooperation and co-ordination improved during the last six years, thanks to a mutually friendly atmosphere.

APPENDIX I

SCHEME FOR APPRENTICES - COURSES FOR RECRUITMENT

NUMBER OF STUDENTS RECRUITED FROM THE FORMER DIVISIONAL PROVINCES

FOR 1965/1966 and 1966/1967.

TYPE OF COURSE	Kinshasa	Lubumbashi	Mbandaka	Kisangani	Luluabourg	Kivu
1965/66 Telecommunications Technicians	33	5	1	2	2	2
1966/67 Telecommunications Technicians	33	4	-	-	7	6
1965/66 Radio Operators	16	2	-	1	4	2
1966/67 Radio Operators	12	3	-	2	5	3
1965/66 Jointers	15	2	-	2	3	3
1966/67 Jointers	8	4	-	-	-	13

APPENDIX II

The following table indicates present utilisation of students who have successfully completed courses of the School of Telecommunications since 1964

Courses	Date of graduation	Number of graduates	Number employed by PTT: Kinshasa	Number employed by PTT: Provinces	Number having left PTT: to other Govt	Number having left PTT: to private employ
Technical Courses						
62/63 – 63/64	5.6.64	19	16	3	0	0
63/64 – 64/65	4.9.65	43	19	21	2	1
Other Courses						
Operators 63/64	5.6.64	23	12	7	3	1
Jointers 63/64	25.7.64	8	7	–	–	1
Operators 65/66	24.9.66	20	–	–	–	–
Jointers 65/66	24.8.66	22	8	14	–	–
El.Incon. 65/66	2429.66	6	3	–	3	–
Total		141	65	45	8	3

YEAR : 1966 PROJECT - U - TELECOMMUNICATIONS

Name	Nationality	Function	Station	
ALTORFER, U.	Switzerland	Broadcasting Planning Expert	Kinshasa	
BAUER, O.	Germany	Auto-Telegraphy Expert	Bukavu	(SA)
BOHNEN, E.	Switzerland	Operation and Radio Maintenance Expert	Kinshasa	(SA)
Von BOSCAMP G.	Germany	Expert - Registering Frequency	Kinshasa	(SA)
CALI, G.	Italy	Auto-Telephony Development Advisor	Kinshasa	
CRUNTCH, J.	Switzerland	Administration and Organisation Expert	Kinshasa	
GABRE-SELASSIE, G.M.	Ethipia	Operations and Air Maintenance (Radio)	Kinshasa	
GAYAN, J.	Sous Israel	Telephone Operations and Maintenance Expert	Kinshasa	
HUSTINX, A.	Belgium	Auto-Telegraphy Development Adviser	Kinshasa	
KRAN, H.	Germany	Auto-Telegraphy Expert	Lubumbashi	(SA)
KUMAR, Al	India	Operation and Maintenance (Radio)	Kinshasa	
MARQUET, J.	Belgium	Operation and Maintenance (Radio)	Kinshasa	
MAURER, C.	Switzerland	Auto-Telegraphy Expert	Kinshasa	(SA)
MULLER, J.	Germany	Auto-Telegraphy Expert	Kinshasa	(SA)
PAPAMANOLIS, A.	Greece	I.T.U. Administrator	Kinshasa	

15

YEAR: 1966 PROJECT - U - TELECOMMUNICATIONS

Name	Nationality	Function	Station	
PIERRE, E.	Haiti	Telephone Terminals (Radio) Expert	Kinshasa	
PILOTAN, J.	France	Operations and Maintenance (Radio)	Bukavu	
RET, E.	France	Cable Expert	Kinshasa	
SCHEER, W.	Germany	Teleprinter Workshop Technician	Kinshasa	(GA)
SCHLANGEN, A.	Germany Switzerland	Auto-Telegraphy Expert	Kinshasa	(GA)
SCHMID, F.	Switzerland	Operation and Maintenance	Kinshasa	
SCOTT-JACKSON, E.	U. K.	Telephone Operations and Maintenance Expert	Kinshasa	
SONDAS, R.	France	Planning Adviser	Kinshasa	
TEKROS, G.	Ethiopia	Chief of Mission	Kinshasa	
WOLLBOLDT, G.	Germany	Auto-Telegraphy Expert	Kinshasa	(GA)

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Note : (GA) German Aid
(SA) Swiss Aid

WORLD METEOROLOGICAL ORGANIZATION

4.06 WMO

The Congo is the second largest unified land mass of the whole equatorial belt in the world and with its topographical structure ranging from the low-lying central basin of the Congo River area to the highlands of the east, it is particularly affected by the wide variety in weather which characterises this zone. Accurate meteorological and climatological information is essential, not only in almost every sphere of economic and social activity in the Congo itself, but because climatic factors developing here spread their influence over a very wide area, including the Atlantic and Indian Oceans. That this has been appreciated for some considerable time is shown by the fact that some of the Congo records of meteorological data go back to 1912. It was not, however, until 1934 that a State Meteorological Service was established.

To compile an accurate picture of weather conditions in any one country, it is necessary to have information on the weather conditions prevailing in other countries. The equatorial belt is the area of the world which received the greatest amount of solar radiation and is thus the source of meteorological phenomena which eventually influence the weather all over the world.

The expansion of aviation added considerably to the responsibilities of the Meteorological Service, accurate information regarding the weather being a sine qua non for safe and economical aeronautical operations.

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METEOROLOGICAL SERVICES in the CONGO

1. ROLE of SERVICES

The meteorological and geophysical service of the Congo is an administrative branch within the Central Governments Ministry of Transport and Communications.

Its services include :

The observation and study of physical phenomena in the territory's natural milieu, with attention to :

a) application of all sorts of meteorological data to develop (i) the economy, (ii) natural resources and (iii) well-being of the population;

b) collaboration in world meteorological and geophysical studies of the earth;

c) collaboration in the centralizing of observations and studies made in the same sphere by other persons or organizations on the Congo.

The activity of the Service consists in observations, treatment of phenomena for study or publication, provision of certain technical information, routine or by special request, to other public services.

An intense programme of research is associated with these tasks; above all to improve methods of analysis and practical implementation and also to deepen the knowledge of phenomena in equatorial regions, thus contributing to world knowledge of such phenomena.

2. STATE of the METEO SERVICE before INDEPENDENCE

Before Indpendence the Service consisted of :

a) 3 meteorological and geophysical centres, situated at BINZA (Kinshasa), KARAVIA (Lubumbashi) and RUAMPARA (Bunia), all equipped with instruments for seismology, geomagnetism, and measurement of atmospheric radio-activity, rainfall, non-radio-active atmospheric

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pollution, atmospheric electricity, electric storms and ozone;

b) 1 principal met-centre at N'Djili, which is the Congo's main airport, and secondary or auxiliary met-centres at the airports of LUANO (Lubumbashi), Kisangani and Luluabourg;

c) 5 altitude observation centres at Binza, Karavia, Ruampara, Mbandaka and the Kamina-base;

d) 98 synoptic surface stations, of which 20 carried out pilot-balloon observations; and approximately 1,200 climatological stations.

The met personnel consisted of 61 foreign scientists and techniciens, and 297 Congolese lower grade personnel. It should be noted that only semi-technical posts were occupied by the Congolese.

Telecommunications were not sufficient during this period to assure exchange information on phenomena in the interior or exterior of the Congo. There was no telecommunications system reserved for transmission of meteorological data. This was carried out by the R.S.F.T.A. (réseau fixe de télécommunications destiné à aéronautique) on the one hand, and by ordinary public services (always overloaded) on the other.

3. STATE of MET SERVICE after INDEPENDENCE

A short time after Independence, the state of the meteorological service was as follows:

a) Only 8 remained of the 61 ex-patriate scientists and techniciens, the consequence was that the services were drastically cut.

b) The three meteorological and geophysical centres had practically ceased functioning because of lack of skilled personnel. Congolese forecasters did not exist, therefore the airports centres could not fulfil their tasks. Surface and Altitude studies could also not be made; and information from abroad could not be received.

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c) The network of synoptic stations ~~of~~ were extremely disorganized. Observers, not belonging the ethnic group of the observed region, left their posts. Other stations functioned with no regularity, thus permitting no precise observations. Observations received were so infrequent that they could not fulfil the recommendations made by W.M.O. for Africa.

d) Telecommunications were totally inadequate for basic and detailed reports between the Congo and Europe. Thus transmissions between Kinshasa, Brussels, Kisangani and Accra were very limited.

To meet national and international needs in the field of meteorology, the World Meteorological Organisation (WMO) and its predecessor, the International Meteorological Organisation (IMO), have, over the past 90 years, formulated agreements and set standards necessary for the acquisition and transmission of meteorological information essential in different fields in which it plays a part.

Before independence, in July 1960, the Meteorological Service consisted of the following networks : synoptic stations amounting to 98; over 1,000 climatological stations; a main meteorological office at N'Djili airport, the main airport of the Congo; dependent or independent meteorological offices at the capital of the then existing chief provinces, namely, Kinshasa, Equateur, Orientale, Kivu, Katanga and Kasai; agrometeorological stations distributed all over the country which were run in conjunction with the Institut national d'études agronomiques du Congo (INEAC), aerological stations, comprising approximately 25 pilot balloon stations, five radiosonde stations, and weather surveillance radar at the main airport of Kinshasa; three geophysics centres with a world-wide reputation, equipped with modern institutes for seismology and geomagnetism; two centres for ionspheric sondes to study the behaviour of electromagnetic waves by day and night - important in telecommunications for the choice of radio frequencies; a centre for measurements of radioactivity in the atmosphere and cosmic radiation; posts for the counting and registration of lightings; equipment for the measurement of ozone; and a school of meteorology at Binza for the

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To carry out these objectives, the WMO mission was to be deployed in the three most important spheres: advisery operational and training.

Please see relevant annex for the numbers of experts W.M.O. has affected to the Congo.

4.062 The Implementation of the Programme

4.0621 Advisory Services

Throughout the six years of WMO assistance to the Congo there were on the average two permanent advisers. The Chief of Mission assumed the post of Principal Adviser and Co-ordinator to the Government of the Democratic Republic of the Congo assisted by an adviser in synoptic meteorology. This small number of advisory experts is due to the priority given to the continuity of operational meteorological services and the training of counterparts.

In 1960, the WMO plan for reorganizing and maintaining the functions of the Service envisaged recruiting three advisers, one of whom would also serve as Chief of Mission. The second post, that of Adviser in Synoptic Meteorology and Meteorological Telecommunications, was not filled until May 1962, since its original incumbent - who had been recruited in September 1961 - had almost immediately thereafter been appointed Chief of Mission. The third post of Adviser in Geophysics and Experimental Meteorology was not filled and is no longer required.

WMO experts assisting the Meteorological Institute in Binza (Kinshasa)* have engaged in the preparation of a plan for a meteorological telecommunications network and have briefed the Congolese delegations to the meeting in 1961 of the WMO Regional Association for Africa, and to the 1962 meetings of the three WMO commissions. In 1966 this separate telecommunications network has not yet been installed, although its plan has been approved.

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* See sub-chapter p... of the present chapter

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The Senior Representative of WMO in the Congo assisted the Director of the Meteorological Service to draft a new statute governing the activities of the Meteorological Institute. The WMO mission also revised the instructions applicable to all sections of the Service.

The WMO Congress, which meets one in four years, was held in Geneva in April 1963, and was attended by representatives of the Congolese Government and Chief of the WMO mission in the Congo. The Congress requested members to intensify their efforts with a view to operating regional synoptic stations according to national resources. In this respect 45 meteorological stations out of the Congo's 80 synoptic stations were requested to broadcast their observations at specified hours and the establishment of five radiosonde stations was recommended at M'Bandaka, Bunia, Kinshasa, Luluabourg and Lubumbashi.

The WMO was represented by its Principal Representative in the Congo of the meeting of the Economic Commission for Africa held in Kinshasa in February 1963. In March the Secretary-General of WMO visited the Congo, and in September/October, the Chief of the Research Division of WMO made a tour of the country's geophysics stations in order to advise on a programme for the International Quiet Sun Year.

Picture
U.N. 79640

(Text) : Here the WMO Secretary-General, Mr. A.A. Davis (without glasses in the centre) looks at a solar water heater together with the Senior WMO Representative to the U.N. in the Congo (left) and WMO expert in radiation (with beard to the right), further right (smiling) is the Director of the Meteorology Service of the Democratic Republic of the Congo.

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In September 1963 a conference of WMO forecasters was held in Kinshasa, attended by Congolese senior officers, and various matters concerning meteorological services to aviation were discussed.

The whole subject of meteorological telecommunications was thoroughly discussed by the African and Indian Ocean Navigation Plan (AFI) Regional Commission of ICAO, which visited the Congo in October 1962.

In 1964 the Principal Adviser assisted in preparing the request of the Government for the Special Fund to support a five-year training project at the meteorological services training centre in Kinshasa. Subsequently, at its general meeting in June 1964, the Special Fund agreed to render its financial assistance to the project.*

During the previous years, the insufficient telecommunications network for the meteorological service hampered much of the operational work.

Finally, towards the end of 1964 the Ministry of Telecommunications accepted in principle a project advocated by the WMO advisers for the past three years, that the telecommunications system for aeronautical and meteorological operations should be under separate direction from that of the commercial network.

The reorganisation of the climatological service, of great importance for the economic and social development of the country, started slowly, owing to difficulty in recruiting experts and in inspecting the country's 1,200 climatological stations, (most of them unmanned since 1960). However, towards the end of the year plans were drawn up in collaboration with the FAO Mission for the launching in 1965 of an inspection programme for the Bas-Congo. The disturbed political situation, however, prevented these plans from being carried out before the second trimester of 1965.

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* For further details see p... of the present chapter. ./.

In addition, with the assistance of the WMO Mission, the publication of accumulated climatological data both from the meteorological service and INEAC was begun.

In 1964 the Chief of Mission visited several centres outside Kinshasa and spent two weeks in WMO Headquarters in June, when he assisted in discussions arising out the Executive Committee's recommendations concerning the mission, and in the revision of the draft plan of operations of the Special Fund Programme. He also assisted the Congolese authorities in the preparation of their budgets for the meteorological service, in preparing their requests for future technical assistance programmes and in the drafting of a plan for the creation of a National Hydrological Committee.

In the course of his duties as Adviser in Synoptic Meteorology, the Deputy Chief of Mission acted as a member of the Government's Commission on Aeronautical Telecommunications, its Working Group on the AFI-RAN agenda and on the ICAO advisory body on the implementation of its standard and recommended practices. He took part in numerous discussion on meteorological telecommunications, and paid several visits of inspection and organisation to the country's forecasting offices. In January/February he acted as adviser to the Congolese delegation to the joint meeting of the WMO Commission for aeronautical Meteorology and the ICAO Meteorological Division, and in November/December to its delegation to the ICAO African Indian Ocean Regional Air Navigation Committee meeting.

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In addition, the Deputy Chief of Mission continued to assist the directors of the meteorological service in dealing with technical correspondance with other services and with the WMO and ICAO secretariats; in the preparation of instructions on codes, synoptic charts, psychrometric tables and in the revision of a text-book on meteorology used in the training courses as well as assisting in the day-to-day work of the directorate of the meteorological service.

At the end of 1964 and in early 1965 it was felt that WMO has almost achieved the aims of :

(a) assisting the Government to train in the minimum possible time the Congolese personnel required to maintain its essential services in meteorology;

(b) providing essential operational services until such time as sufficient numbers of qualified Congolese are available to take them over.

Having reviewed the progress already made towards achieving these aims, and nothing in particular that :

(a) The Government, with the assistance of WMO was about to establish a chair in meteorology in the Faculty of Physical Sciences at Lovanium University for training Class I meteorological personnel;

(b) in June 1964, the U.N. Special Fund approved a five-year project for the establishment of a training centre in Kinshasa to train meteorological personnel in Classes II, III and IV required by the country, the project being executed by WMO in collaboration with the Government, the plan of Operation of the project was signed by the parties concerned in April 1965. *

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* See also p... of the present Chapter.

An assessment of the overall situation was made at the same time. This was followed by the drawing-up of a plan (signed Sep 1963) for accelerated training of counterparts.

~~Nevertheless, despite these undisputed achievements, the following two years were full of WMO activity in the Congo.~~

In 1965, the WMO Chief of Mission acted as Principal Adviser to the Government on meteorological questions.

He assisted in the finalising of the Special Fund Plan of Operations and of the Congo Plan. For this purpose he visited WMO Headquarters twice, being accompanied on one occasion by the Director of the Meteorological Service. He also assisted the Congolese authorities in the preparation of their detailed request for future technical assistance within the framework of the Congo Plan. Plans were prepared for the expansion of the hydro-meteorological service and for the definite creation of a telecommunication network for meteorological purposes.

The Government was advised on the measures to be taken towards the implementation of the Congo Plan, and, in particular, advice was given on matters arising out of the Government's obligations under the Plan, such as budgeting, establishment of staff salary scales, recruitment policy, and drafting of documents regulating the legal status of the Meteorological Training Centre.

In the course of his duties the Adviser in Synoptic Meteorology, revised the technical instructions for the forecasting centres, prepared guidance material for forecasters and advised the Congolese Government on the implementation of the revised ICAO Air Navigation Plan for the Africa-Indian Ocean region. He also planned in detail the programme of the new central forecasting office.

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Briefs were prepared for the Congolese delegations to four international meetings. The Chief of Mission acted as adviser to the delegation at one of these meetings; his deputy at another and the expert in hydrometeorology at the other two.

At the request of the Minister of Transport and Communications of the Central Government the Chief of Mission attended a meeting of Provincial Ministers of Transport held in Kinshasa from 21 to 25 January 1965. The objective of the meeting was to exchange views on the respective spheres of action of the Central and Provincial Governments in restoring and expanding the country's transport and allied services, and also to convince the provincial authorities that the Central Government is not in a position to satisfy all their demands overnight.

In July 1965 the Deputy Chief of Mission in his function as adviser in synoptic Meteorology undertook a profound examination of the present state of the observational networks and its telecommunication facilities and of the structure of the forecast offices with a view to preparing plans for the elimination of the lack of co-ordination and liaison which resulted from the events of 1964.

During 1966, the Chief of Mission continued in his role as adviser to the Government and the Synoptic Meteorology expert, in addition to his advisory functions, assisted at a number of reunions which were held in order to determine a working programme for the aeronautical telecommunications service which was recently transferred from the Ministry of Posts and Telecommunications to the Civil Aviation Directorate.

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At these reunions it was also determined which of the aerodromes throughout the country, may in the future, transmit regular meteorological observations. This adviser also replaced the Chief of Mission

The Government and WMO consider that the Congo has now at its disposal the means necessary for the most rapid and efficient achievement of the original stated aims. The Government and WMO have, therefore, agreed that it is appropriate to implement the 6 year plan (signed in September 1965), which outlined the future activities of WMO's technical assistance mission to the Congo and, in particular, indicated the stages leading to the replacement of the international experts by qualified Congolese personnel.

4.0622 Operational Services

The first priority of WMO has been the recruitment of personnel to assure maintenance of aviation forecasting. With the help of the French Meteorological Service a number of forecasts were made available on a short-term basis in the early days of the mission's activities, thus bridging the gap until recruitment could be effected by normal means. Skeleton forecasting operations were put into effect at Kinshasa and Kisangani airports and these were supplemented in April, 1961 by six forecasters in Kinshasa where N'Djili airport had begun to operate on a 24-hour basis. Two forecasters were posted to Kisangani and, although Lubumbashi had been without a forecast service since September 1961, Kinshasa began to transmit daily provisional forecasts to that

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city and the other areas in May, 1962. Between December 1962 and June 1963 forecast centres were also opened at Lubumbashi, Kamina, Luluabourg and N'Dandaka airports.

In conjunction with the ICAO and ITU Missions, a radio teletype line was installed which operated during the day between the aerodromes of Kinshasa and Lubumbashi. The importance of Lubumbashi as an air base was shown by the number of flights - about 525 a month - and two forecasters were attached there to assist the chief forecaster to maintain a 24-hour-a-day service.

In August 1964 it proved necessary, for security reasons, to withdraw UN personnel from Kisangani and Luluabourg, and for the rest of the year three of the withdrawn WMO experts assisted and guided the Congolese forecasters at Kinshasa airport while two others were stationed at Lubumbashi Airport. One expert was seconded to the training programme. As an example of the work done during 1964, it may be quoted here that the meteorological service was dealt with 1,777 international and 5,371 internal flights. The chief forecaster, also assisted in the revision of staff instructions for forecasting and ancillary personnel.

Lack of security prevented the resumption of the forecast services at Luluabourg and Kisangani until August 1965. Seven WMO forecasters, four at Kinshasa and three at Kisangani airport, however, continued to assist their Congolese colleagues in maintaining essential services for civil aviation and to provide on-the-job training. One expert acted as adviser to the officer-in-charge of the meteorological office at Kinshasa

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airport, while the duties of another expert included assisting and advising the assistant director responsible for the meteorological services in zone VI (for meteorological purposes the country has been divided into different zones corresponding with the former provinces), and the officer-in-charge of the meteorological office at Lubumbashi Airport. Forecasting was provided for 1,753 international and 4,856 internal flights.

In 1966 the Principal Forecaster was attached throughout most of the period to the N'Djili airport in order to assure a permanent meteorological service needed by Civil Aviation; but has also advised on questions of operational telecommunications due to the absence of local personnel.

The team of forecasters continued training and forecasting in various regions and during the period continual progress was made in opening more stations, that operate on a 24-hour basis, throughout the country. Repairs to damaged instruments is in constant process.

Of the former 1,200 climatological stations, only some 600 were functioning in 1963. Most of these stations were operated on a voluntary basis and where the former operators had left the Congo, the stations had to be closed. With the assistance of WMO inspectors it is hoped to re-open the abandoned stations gradually. The climatological stations are, in addition, important for agriculture and, thus, close co-operation has been obtained from GAO for the inspection service for the different stations.

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Apart from climatological data the forecasting service depends on the synoptic network for a regular, 24-hour-a-day supply of reports on current weather from an adequate number of observation stations. The observation services which continued to be maintained - i.e. where some staff remained available - deteriorate more and more. From July 1960 to March 1961, the number of observation stations which were shut down fluctuated between 22 and 26 out of the 98 existing stations. By the end of May 1961, following the political upheaval of the previous two months, only 16 were still manned. In the face of this situation the Government decided to request, in the 1962 programme, the inclusion of a number of inspectors in the WMO mission to investigate and report on the deterioration suffered by the observations network and to give on-the-spot instruction. Up to 1963, some 70 stations had been inspected. It has been found that several stations were destroyed and a large number were too far from the airports they serve; a counterpart fund project was launched for the repair or reconstruction of 40 stations.

It was in May 1965 that a WMO expert was assigned to the Climatology Division to assist and advise its Chief. He helped in the re-organisation of the Division, provided intensive training courses, planned and commenced the compilation of aeronautical climatological statistics.

In 1966 there were reported to be 389 climatological stations. 341 for rainfall measurement and 48 for measuring both rainfall and temperature.

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Following the disturbances which occurred from June 1964 onwards the activities of three of the five inspectors of stations were restricted to the main centres, but it was possible to employ them usefully in other capacities. One was posted to Lubumbashi to assist the forecasting team there; another worked in the synoptic meteorology section, and also participated in the training programme. The third was assigned to the office of the director of the meteorological service to assist him in the supervision of the building programme, preparation and execution of order for equipment, and administration of the boarding school. Towards the end of the year the remaining two inspectors had to be withdrawn. One of them then acted as adviser to the officer-in-charge of the networks section, and the other assisted in the aerology section at Lubumbashi.

In June 1965 three inspectors resumed their proper functions. One expert carried out inspections of one synoptic and three climatological stations in the "Bas-Congo" area, and of one synoptic and seven climatological stations in the Lubumbashi area. These inspections were made thanks to the already mentioned co-operation of the FAO mission which provided the transport. A second expert undertook the inspection of two climatological stations, again availing of transport facilities provided by the FAO mission. The third visited Lubumbashi, to choose a site for the "Weather Surveillance Radar" project and then Luluabourg, to inspect the aerological station. He also investigated the possibility of resuming the programme of station inspections in the region.

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These three Inspectors completed the training of their Congolese counterparts and left the project at the end of the year.

In 1966 the Chief Inspector of the Telecommunications Network assisted the director of this Service in the preparation of budgets for constructing and equipping new observation stations and has inspected meteorological stations at Bandundu, Kenge, Matadi and Moanda. This expert also made an enquiry into the progress realised by synoptic stations from 1961 to date both at ground level and at various altitudes, and also prepared a monograph concerning energy utilisation in different regions of the country, where wind frequency and speed makes this possible.

At the time of the writing of this report there are in the Congo :

- 32 principal synoptic surface stations (the network plan estimates 45
- 14 supplementary synoptic surface stations
- 3 rawinsonde electronic stations, 2 more in process
- 10 pilot-balloon stations
- 389 climatological stations (formerly 1,200)

The present state of development of general forecasting can be indicated by the fact that in Western Europe there are meteorological observation posts at intervals of approximately 200 miles, whereas in the whole of the Congo there only a score of posts operating fully. To achieve a level of forecasting equivalent to that current in Western Europe, the Congo would need, because of its tropical climate and the resultant localised nature of much of its weather, observation posts at intervals of approximately 125 miles.

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At the Meteorological Institute in Binza (Kinshasa) a WMO expert is establishing climatological statistics for selected airports. The means and standard duration of dry-bulb, maximum and minimum air-temperatures for ten airports are being processed, and are available.

Although before independence five radiosonde stations were in operation, only those at Kinshasa, Lubumbashi and M'Bandaka were functioning in 1963. At Luluabourg a station was established to replace the one which was dismantled at Kamina in 1960. In 1965 only the Kinshasa station was functioning. Three other stations, Lubumbashi, M'Bandaka and Luluabourg are in working order but, due to lack of funds and material, they were not operative. In 1966 the three largest stations were operating fully. The other two are in the process of being rectified. Expert at Bunia expects his station to be firmly established by the end of November.

The WMO expert who in the latter half of 1963 had completed a detailed study of the hydrological needs of the country, at the beginning of 1964 set up a reorganized hydrological section. In the course of 1964 this section, under his guidance, prepared hydrological maps of all the Congo's river basins; drew up an inventory of the available hydrological data and, in addition, he conducted a course of training of the section's personnel. He also assisted the Chief of Mission in the preparation of plans for the creation of a National Hydrological Committee, and brought about a considerable degree of coordination among the various bodies outside the meteorological service whose activities touch on hydrology, such as the River Navigation, Water Supply and Hydro-electricity companies, the Public Health Ministry and the Universities.

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In 1965 the task of preparing an inventory of the available basic data and hydrological maps continued; the inventories of hydrological data for the following zones were completed : N'Bandaka, Kasaï and Kisangani. To set up a proper hydrological service it is necessary to establish a completely new network of hydrological stations and, at the same time, to train qualified personnel for the service. At the request of the Government the WMO expert in hydrology worked out detailed plans for a ten-year project which will be submitted to the Special Fund for financial assistance.

In February the WMO expert in hydrology attended the meeting of the WMO Regional Association as advisor to the Congolese delegation. In June 1965, the same expert participated as adviser to the joint WMO/IASH symposium on hydrometrical networks at Quebec.

In 1966 the same expert continued to supervise the analysis of all available data concerning rainfall, temperature and evaporation from the hydrometeorological stations. He catalogued the number of operational and non-operational stations in the Congo. He was responsible for the completion of the drawing of hydrological maps, which, when pointed, will facilitate hydrometeorological studies.

He ensured that Kinshasa's evaporation rate was constantly measured and recorded. He prepared a draft for a statute authorising the establishment of a National Committee of Hydrology. This would be an Institute, whose function would be to co-ordinate all hydrological activities and studies - including water - development projects in the Congo.

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The hydrology expert also performed his roles as adviser to the meteorological service and trainer of local personnel.

During the initial years of assistance the geophysics section, owing to lack of personnel, has been unable to do more than give guidance and furnish small quantities of equipment. In 1964, the WMO expert in geophysics, in addition to his training activities, carried out a detailed examination of the geophysics centres at Kinshasa and Lubumbashi. During the first 6 months of 1965 the re-mounting and re-orientation of the geo-magnetics instruments was completed at the Kinshasa centre. The centre is now operative after a delay caused by un-availability of spare parts. An overhaul of the seismology centre took place and the instruments were found to be in good condition.

During the second half of the year he assisted in the rehabilitation of the geophysics section at Lubumbashi and in the training of its personnel. An expert in geophysics was not present in the Congo during 1966.

An expert in Aereology arrived in February of 1966. He aquainted himself with existing aerological problems and has submitted an outline of his intended work. In May and June he was stationed in Luluabourg, where he organized the aerological section and trained its personnel.

The whole activities of the meteorological services are co-ordinated at the Meteorological Institute in Binza (Kinshasa). The Institute has three functions :

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(a) training of Congolese personnel; *

(b) administrative, research and operational centre of the Congolese Meteorological Service;

(c) repair and maintenance of instruments and installations.

The Meteorological Institute is, thus, responsible for studies - and their application - in radiation, ionospherics, atmospheric electricity, ozone layers, geomagnetism, seismology, gravimetry and related fields. In addition, the Institute houses the administrative centre of the Congolese Meteorological Service and the climatology, hydrometeorology, agrometeorology and meteanography divisions; the instruments division, which is responsible for maintenance, repair, calibration and development of meteorological instruments; the metalwork, electrical and carpentry workshops; and the printing and publishing division. For all the above mentioned activities the Institute is acting as co-ordinating and planning body. Up to now, however, there was no centre to analyse the data collected by the various synoptic, meteorological and climatological stations. At present only a number of more or less independent sub-centres are analyzing the data from, and issuing forecasts for, their respective zones. In accordance with plans prepared by WMO advisers in late 1962, for the purpose of setting up a more accurate analysis and forecast service, the building of a Central Analysis and Forecast Office at the Institute started in February 1964, and is now complete. The building is being financed from counterpart funds.

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* see 4.0623

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The Binza centre provides monthly records of the weather report to the Ministry, WMO head office and the UN in Kinshasa.

An outline of the activities of the instrumental divisions is as follows :

During the first three years of WMO's technical assistance the workshops were completely reorganised by a member of the WMO team. WMO experts gave particular assistance to the electronic division. Since 1963 the instrument division, the electronic division and the workshops are capable of repairing any instrument and any installation of the Congolese Meteorological Service. Two experts have been assisting the division for the past three years.

In 1966 one of them was responsible for the maintenance of precision instruments in Kinshasa and the training of Congolese personnel. He also visited the meteorological stations in MOANDA, KITONA, LULUABOURG and N'DJILI, to install, transfer and repair a certain number of instruments. The other was accountable for the maintenance of electronic equipment (radiosonde and meteorological radar). During the first half of the year he executed

1. the installation of the altitude station in Luluabourg,
2. repair and regulation of the two METOX receivers,
3. repair the appropriate apparatus and start the production, filtering and stock of hydrogen,
4. start the running of the Luluabourg radiosonde station.

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He was responsible for supervising the written entrance - examination for Class III meteorologists, which took place in Lubumbourg. The control question of batteries used by the congolese meteorological service also received his attention.

From the outset of WMO's assistance, telecommunications have been the main problem. It is still unsolved although, in collaboration with ITU and ICAO, some minor improvements have been achieved.

It is essential, as has been realised in most countries, that the meteorological and civil aviation services enjoy the use of telecommunications systems reserved exclusively to them. As early as August 1960, the WMO mission put forward a detailed plan on these lines and has reiterated its criticisms and recommendations many times since. In 1964 the Ministry of Telecommunications accepted the plan in principle, and it remained for the Meteorological Service to be allowed to implement it.

By the end of 1964, the situation looked more promising than at any other time since the mission began its activities. The WMO was endeavouring to furnish some equipment, more had been obtained on loan from the UN Field Service, and still more was being obtained through USAID channels. The international telecommunications links are almost sufficient. The internal network for the transmission of data from the stations to the sub-centres and the Meteorological Institute in Binza as well as the telecommunications links between stations belonging to the same level was, however, in extremely poor condition. In 1965 a telecommunications network was installed in skeleton form for the meteorological service, and since then it is gradually gaining body.

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A school with boarding facilities for 40 students has been in operation at BINZA since 1954. Until 1960 the aim of this centre was to train observers, map tracers, and techniciens for the installation and maintenance of instruments at meteorological stations. ~~From~~ At time, this school also gave special courses according to needs. Since 1961 the training of various classes of meteorologists (conforming to W.M.O. document No 50) has been carried out, thus creating the francophone African Centre for the training of class II, III and IV meteorogists.

The W.M.O. training programme in the Congo since 1961 is as follows:

1. <u>Class II Meteorologists</u>

a) First Session: 16 students attended the preparatory course, August 1960 - September 1961. Only 14 passed their exams.

Of this 14, 10 passed the forecaster's course from September 1961 - September 1963.

The course lasted 38 months, interrupted occasionally by political events.

b) Second Session: Entrance exams took place in June 1962. 12 out of 18 candidates were successful. 8 out of these 12 passed the preparatory course from July 1962 - to February 1963. 4 out of the 8 passed their forecaster's course which took place from February 1963 until September 1965.

c) Third Session: These students were recruited in 1965. They will receive practical training after the theoretical instruction. There are 22 students (of whom 9 are military). Their training ends in September 1967.

d) Fourth Session: In October 1966, 15 civilian students were recruited and are now receiving their theoretical instruction.

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2. Class III Meteorologists

Since 1963

- 12 students have successfully completed their training.
- 7 students (of whom 1 military) are now receiving practical training.
- 11 students (of whom 5 military) are now receiving theoretical instruction

3. Class IV Meteorologists

Since 1962

- 12 completed training at Kisangani (November 1962 - May 1963)
- 19 completed training at Binza (July 1962 - July 1963)
- 10 completed training at Luluabourg (December 1963 - February 1964)
- 11 completed training at Lubumbashi (February 1963 - May 1964)
- 19 completed theoretical only: Binza (October 1965 - February 1966)
- 16 completed theoretical only: Binza (March - June 1966)
- 19 (of whom 7 military) are now receiving theoretical instruction at BINZA.

Total 106 (19 of whom now receiving instruction).