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Joint ECA/ITU Programme for the Development
of Telecommunications
in Africa

PROPOSED WORKING PROGRAMME

JOINT ECA/ITU PROJECT FOR THE DEVELOPMENT OF
TELECOMMUNICATIONS IN AFRICA

PROPOSED WORKING PROGRAMME

(10 YEAR PROGRAMME)

CONTENTS

Chapter 1

IMPLEMENTATION PROGRAMME FOR AN AFRICAN TELECOMMUNICATION
NETWORK

Paragraphs

INTRODUCTION

1 - 3

Part One :

Short-Term Programme

Present Structure of Telecommunications
in Africa and Short-Term needs

4 - 8

Establishment of new circuits between
African countries

9 - 14

Circuits between African countries and
other regions

15

Comments on the use of Satellites

16

Short-Term National Requirements

17

Part Two :

Long-Term Programme

Long-Term Telecommunication
Requirement for Africa

18 - 23

Economic and Technical Pre-Investment
Survey and preparation of a plan of
operation

24 - 28

Construction of the network

29 - 31

Chapter 2

TRAINING PROGRAMMES

	<u>Paragraphs</u>
General	32 and 33
Establishment of local and regional training facilities for technical and administrative personnel	34 - 37
Training programme for African Telecommunication instructors	38 - 41
Management courses and seminars for Directors of African Telecommunication Administrations	42 - 44
Short-Term Training Programme for Technical personnel	45 - 46
Publication of technical and administrative texts and engineering instructions adapted to needs of telecommunication administrations	47 - 49

Chapter 3

PRELIMINARY ESTIMATES OF COSTS AND PROPOSALS
FOR FINANCING

(a) Costs	50
(b) Financing	51 - 53
Conclusions	54 - 58
Table 1	Abridged Graph of Proposed Working Programme and Time Table. (After page 1)
Annex 1	Preliminary Estimates of Costs for the African Telecommunication Programme.

JOINT ECA/ITU PROJECT FOR THE DEVELOPMENT OF
TELECOMMUNICATIONS IN AFRICA

PROPOSED WORKING PROGRAMME

INTRODUCTION

1. At its 5th Session the ECA paid special attention to the need for improving telecommunication systems in Africa and requested the Executive Secretary to explore the matter and submit a report at the 6th Session.^{1/} Concurrently the Organization of African Unity at its first Conference in May 1963 stressed the importance and urgency of creating intra regional telecommunication facilities in the interest of promoting African Unity.
2. At the request of the Executive Secretary of the Commission and with the co-operation of the Secretary-General of the ITU^{2/} a special joint ECA/ITU unit located at the ECA Headquarters was set up with the specific tasks of assisting in accelerating the development of telecommunications in the African region ; and to work out a plan for the implementation of a modern, regional telecommunication network to meet immediate and long term needs and to provide interconnexion of the African network with the world wide telecommunication system as envisaged by the Regional Plan Committee for Africa of the ITU. Document E/CN.14/249 referring to the preparation of an African telecommunication network was presented to the 6th Session and was approved on the 2nd February 1964 by Resolution 106.
3. As a result of the action called for in the above documents an integrated working programme has been prepared whose objectives are to solve major telecommunication problems of Africa within about ten years time, including both the training of specialized personnel and provision

^{1/} Annual Report of ECA to the Economic and Social Council on its 5th Session (E/CN.14/229 para. 263 (c)).

^{2/} International Telecommunication Union.

of new or improved installations ; to solve immediate problems a short term phase is included estimated to take approximately two years ; the establishment of a financial scheme is suggested to facilitate the implementation of the programme as a whole. The proposed programme conforms also with the general terms of United Nations Resolution No. 1710 (XVI) ; "United Nations Development Decade" and in particular para.4. A graphic presentation of the working programme is found in table 1 in a condensed form and also in Annex 2 which gives more detail of the proposed time-table.

1. The proposed programme is divided into three main phases: immediate, short-term and long-term. The immediate phase is designed to address the most urgent needs, such as the provision of basic services and the establishment of a financial scheme. The short-term phase is intended to build on the immediate phase and to develop more comprehensive programmes. The long-term phase is designed to ensure the sustainability of the programme and to address the underlying causes of the problems.

2. The proposed programme is based on the following principles: (a) the participation of the people in the development process; (b) the promotion of self-reliance and self-help; (c) the development of human resources; (d) the promotion of economic growth and development; (e) the promotion of social justice and equity; (f) the promotion of environmental protection and conservation; (g) the promotion of international cooperation and solidarity.

3. The proposed programme is designed to be flexible and adaptable to the changing needs and circumstances of the people. It is also designed to be self-financing and self-sustaining. The programme is expected to have a significant impact on the lives of the people and to contribute to the achievement of the United Nations Development Decade.

4. The proposed programme is expected to be implemented over a period of ten years. It is expected that the programme will be completed by the end of the decade.

5. The proposed programme is expected to be a model for other developing countries.

Chapter 1

IMPLEMENTATION PROGRAMME FOR AN AFRICAN TELECOMMUNICATIONS NETWORK

Part One : Short-Term Programme

Present Structure of Telecommunications in Africa and short-term needs

4. It is a known fact that the economic structure in Africa in the past called mainly for a telephone and telegraph circuits with countries outside of the African continent and communications between African cities were much less frequent than those with the former metropolitan areas and world business centres through which most of the business of the African countries was conducted. Intra African traffic was mostly switched through these circuits ; in some cases inter connexion by telephone between African cities could not be established and is still not possible at present.

5. The rapid transformation of the continent into a group of autonomous nations and the consequent change in the political and economic structure has brought about a demand for direct communications between the African countries. New circuit requirements coming up within Africa are essential to aviation, shipping, meteorology, business and government. Traffic on the existing links with countries outside of Africa is also increasing according to normal trends or due to new developments, and existing links are in many cases overloaded and considerable delays are being experienced. African countries are therefore facing now the necessity of both opening new circuits to other African countries and at the same time of improving links to outside Africa.

6. While work is being done which will provide permanent solutions, the present installations have to be rapidly adapted and expanded to provide at least for a number of years for the growing requirements and to permit at short notice an increase in the traffic carrying capacity. In some countries, altogether new equipment will have to be set up at relatively short notice.

7. The original mandate contained in Resolution 106 referred mainly to inter African circuits but when examining these the necessity to solve also national needs has become quite evident and must be considered within any assistance schemes for the short-term plan for it to be realistic. (See para. 17)

8. The short-term programme is designed to respond to all these immediate needs and to bridge the gap until the permanent African telecommunications network has been implemented to link African countries with each other, and the continent as a whole to the world telecommunications network.

Establishment of new Circuits between African Countries

9. On the inter African circuits, there are two types which predominate in the present requirements :

- (a) Circuits between distant countries without common border, and
- (b) Circuits between capitals of bordering countries or border areas proper.

10. In the first category (a), circuits are mainly of the order of 600 to some 6000 kilometres. For these, High Frequency (shortwave) radio systems working at least for 12 hours of the day seem to offer a fast and workable solution. The establishment of such circuits can proceed rather quickly and will provide adequate capacity for the requirements of the present and that of the near future.

11. With the use of modern independent side-band equipment and modern (ARQ) telegraph techniques the following facilities can be obtained :

- improved telephone trunk channels ;
- improved teleprinter service for regular telegraph traffic
- introduction of the telex service ; and
- permanent leased channels for use by civil aviation, shipping, meteorology, banks, government and other users.

Representative of this case are circuits between far away centres on the continent like Addis Ababa-Dakar, Cairo-Brazzaville, Leopoldville-Nairobi, Leopoldville-Accra and other similar circuits which have been suggested. High Frequency circuits can be put into operation very soon since most countries have already the necessary building, power supplies, and sites and also in some cases part or all of the required equipment. Training of technical personnel, if not already available, can be done mostly on the job.

12. For circuits of less than 600 kilometres which mainly fall within the category (b) : "circuits between capitals of countries with common border or for border areas proper" the use of :

- tropospheric scatter links,
- short distance VHF links, and
- the improvement of overhead lines or cable circuits,

seem to offer a more adequate solution for the short-term requirements.

Such circuits can also be established at relatively short notice as semi-portable or portable equipments of medium channel capacity are manufactured specifically for such applications ; normally an infrastructure (lines, buildings and sites, etc.) is already in existence in many countries. Examples of these requirements are circuits across the large lakes of Africa separating neighbouring countries where the distances between the points to be connected are below 600 kilometres, sometimes even below 100 kilometres. For the first case the proposed circuits across Lake Victoria can be mentioned with a distance of some 300 kilometres (200 miles) which will connect Uganda with Tanganyika ; for the second case the circuit from Kigali to Shangugu/Bukavu connecting the two countries Rwanda and the Congo, VHF would offer a good solution. Numerous other proposed circuits are listed in the documents of the Regional Plan Committee for Africa of the ITU.

13. The list of circuits shown in the documents of the regional Plan Committee for Africa of the ITU (CCITT-COIR) should serve as a basis for the implementation programme in the short-term phase. It is however likely that new requirements come up during the interval between two sessions of the Plan Committee and these, of course, should be implemented as part of the short-term plan. The ECA/ITU Mission is corresponding with countries between which circuits are planned to maintain up-to-date information about the implementation of the circuits.

14. If any assistance is required for the implementation of these circuits, the needs of each capital, centre or link where the aid is desired can adequately be assessed on an ad-hoc basis ; and circuit-by-circuit correlation can be provided through the ECA/ITU Mission. A one-time continental survey for the short term phase would be costly and time consuming and would not render at the end a valid picture of the situation as changes in the circuit requirements are bound to occur in the meantime due to the present evolution of the African continent. Such survey is on the other hand considered essential for the long term plan as explained in the next chapter. The above ad-hoc procedure of dealing with the short term requirements permits a flexibility and a better efficiency in the utilization of all sources of aid, whether bi-lateral or multi-lateral.

Circuits between African Countries and other Regions

15. During the examination of the problem, it has come to light that circuits, between African countries and countries outside Africa, which were already in existence are in many cases overloaded due to the increased traffic. The efficiency of those circuits is of considerable importance to the economy of the countries concerned and it is recommended that measures be taken simultaneously with the establishment of intra African links to introduce short term improvements which will permit to face the growing traffic needs to places outside the African continent, pending the implementation of the permanent installations.

Comments on the use of Telecommunication Satellites

16. Another alternative which has been mentioned for the above circuits is the use of artificial telecommunication satellites of the synchronous type. It appears however that it will take several years for the technical installations and buildings to be set up, for administrative arrangements to be finalized and for training the specialized personnel. Their practical utilization seems therefore more appropriate to be considered for the long-term programme, referred to in para. 21.

Short-Term National Requirements

17. The proper functioning of the economic and governmental machinery in every country depends largely on adequate and fast means of internal telecommunications. In many countries of Africa, with the present rate of development the telephone ceases to be a luxury or simple convenience and is turning into a necessity for general development in all spheres. With this trend, the demands on the telephone and also on the telegraph systems (including telex) is increasing and existing internal services are highly overloaded in many cases. Urgent measures are necessary to remedy this situation and scrutiny of urgent, internal telecommunication needs should be made by the countries giving high priority to services affecting the economic development. Such urgent national requirements should be brought to notice for inclusion in the short-term programme, particularly if the country requires assistance. The examination of these requirements can be made simultaneously when individual surveys are being made on the short-term programme for inter-African circuits or independently. This will provide a uniform development in the continent and available, potential, aid sources can be directed towards solving the priority needs.

Part two : Long-term Programme

Long-term telecommunication requirement for Africa

18. The main aim of the present programme is the establishment of a large scale pan African telecommunication trunk network and the development of associated national systems as a permanent solution to telecommunication problems of Africa. The preliminary short-term project and the long-term training programmes as well as the financial scheme are considered necessary steps for the implementation and later on for the proper functioning of the projected network. The preparation of routing schemes and technical recommendations for the network is done by the countries themselves at the meetings of the Regional Plan Committee for Africa and by the specialized committees of the CCITT and CCIR of the ITU. The joint ECA/ITU action is intended to facilitate the implementation of the plan.

19. As a first practical step towards building the trunk routes which will form an interconnected continental network as proposed by the Regional Plan Committee for Africa it is necessary to conduct an intensive country-by-country pre-investment survey to assess the relevant economic and technical factors, and to produce a concrete construction and implementation plan. This survey is estimated to take approximately 12 months.

20. The proposed procedure of conducting the survey and preparing the implementation plan on a continental basis will permit a uniform development of telecommunications throughout Africa along modern lines with the possibility of introducing standardized systems suitable for interconnexion. Another important feature is that the pan-African trunk routes can be integrated right away with the national networks resulting in an economic way of implementing both. Emphasis is placed therefore on the importance of starting without delay. Otherwise some of the countries will be impelled by growing requirements to proceed independently with the development of their new systems and later on difficulties for their interconnexion will arise. Also, some countries risk to stay behind in their development leaving new problems open for the future.

21. The implementation of the plan should follow immediately after the completion of the survey. Preliminary estimates indicate that some 30,000 kilometres (18,000 miles) of telecommunication trunk lines may have to be constructed, consisting of wide band transmission systems capable of carrying many hundreds of simultaneous telephone channels, telegraph and telex systems, data transmission facilities, broadcast programme facilities and most likely television channels. Expansion or construction of associated telephone and telegraph installations in the individual countries will also be necessary. It can be anticipated that all modern types of communication equipments and systems will be employed in the African network, like communication satellites, large capacity coaxial cables and microwave relay links, complete automatic switching for telephone and telex, etc. The detail of their application will be determined by the proposed survey.

22. A project of this magnitude has to be backed up by adequate financial resources which must be secured very early. A preliminary estimate indicates that approximately 1000 million dollars will be required in local and in convertible currencies to finance the plan. Chapter 3 refers in some detail to costs and financing.

23. To ensure adequate operation and maintenance of such a network it will be imperative to have qualified personnel in sufficient numbers. The type of technical personnel required is not presently available in the necessary numbers in Africa and a large scale training programme to be started soon is included as an essential part of the working programme. Details will be found in Chapter 2.

Economic and Technical Pre-Investment Survey and
Preparation of a Plan of Operation

24. In order to assess all economic and technical factors involved in the construction of the proposed network a PAN AFRICAN TELECOMMUNICATION PRE-INVESTMENT SURVEY is to be conducted. A separate document^{1/} containing the details of the survey is being submitted to the respective telecommunications administrations in Africa and to the UN Special Fund. See Resolution 106, para. (d).

25. The pre-investment survey is to be conducted from seven sub-regional centres where teams of experts will be posted. Each one of the seven teams will be responsible for conducting the detailed surveys in the proposed sub-regions. The centres have been suggested for administrative reasons providing a geographical distribution of the work. The seven sub-centres are proposed to be located in Cairo, Dakar, Lagos, Léopoldville, Lusaka, Nairobi and Rabat. Between 5 and 7 countries fall into each one of the sub-regions. The survey should take approximately 12 months and it is hoped that the field work can start in July 1965 and be completed by about August 1966. The cost of the project is estimated at US \$ 1.7 million ; the participation of approximately 100 experts will be required. These figures do not include propagation surveys and their cost will be established during the first part of the general survey.

^{1/} ECA-ITU Project No. A-2 (Issue 1)

26. Co-ordination will be established during the survey with other international organizations which have direct interest in the improvement of telecommunication services in Africa, like the ICAO, WMO, UNESCO and others. The ECA Secretariat is to provide all the assistance and experts required for the economic aspects of the survey. It is expected that the project will be in part financed by the UN Special Fund and also from bi-lateral sources, (see also Chapter 3) the latter refers particularly to services of consulting firms for propagation and detailed routing surveys.

27. The survey is to be conducted with active participation of telecommunication experts from Africa, from the various administrations, assisted by international specialists in the various fields. The participation of members of the African telecommunication administrations and other interested departments in this survey will be of considerable importance for making the plan comprehensive of all the existing requirements. Together with the feasibility studies concrete implementation plans are to be prepared by the experts, which should serve as the basis for constructing the new installations in the individual countries.

28. The complete report will be submitted for final approval to a meeting of African government representatives approximately by the end of 1966. This may be a joint ITU/ECA meeting with the participation of all interested telecommunication administrations and representatives of the economic department as well as international organizations, industrial and scientific groups and entities representing the international financial community.

Construction of the Network

29. After the approval of the proposed plans, countries should proceed with the construction of the part of the network falling into their territory. Based on the findings of the pre-investment survey and other available information, schemes will be prepared to provide specific financial and technical assistance as may be required by the countries to permit rapid implementation of the network. (See also Chapters 3 and 4)

30. It is estimated at this time that the entire African network could be operative within about 10 years if the proposed programme is adhered to. Depending on several factors like topography, existence of roads and buildings and several others, certain parts of the network can be operative before the estimated 10 year period.

31. Cancelled.

Chapter 2

TRAINING PROGRAMME

General

32. The importance of training of technical and specialized persons in telecommunications has been repeatedly stressed. Resolution 106 para. (c) requests the Executive Secretary to the Economic Commission for Africa specifically : "to pay special attention to the urgent need for training personnel in the various branches of telecommunications, which is considered a prerequisite for the success of any development programme". The examination of the problem reveals that only a fully integrated large scale training programme for the Continent can bring about the required solution. Steps must be taken rapidly as proper training requires much time even by using modern methods of teaching.

33. A training programme is therefore proposed providing for the establishment of training facilities in various countries or improvement of existing means, when necessary; for a large scale instructors training scheme and for a separate series of refresher courses and seminars in management and organization at director's level. Such comprehensive programmes are considered essential to arrive at self sufficiency in the countries for maintaining a continuous output of trained personnel in telecommunications and electronics, as required by the growing demands, and also to obtain highest efficiency in the management of telecommunication departments.

Establishment of Local and Regional
Training Facilities for Technical and
Administrative Personnel

34. As part of achieving and accelerating sound and self-sustaining development it will be essential to provide local facilities in the various countries for telecommunication training. This is particularly essential for the lower and intermediate technical levels for which regional and overseas training becomes costly and inconvenient. The anticipated telecommunications development in Africa makes it indispensable to devise well conceived and integrated training schemes throughout the continent to arrive at a uniform level of skills. This necessity will be felt mostly after the proposed interconnexion of national networks through the pan-African trunk system, and efficiency of the services in one country will affect the international traffic of others and the reliability of the grid as a whole.

35. It is therefore envisaged in the proposed programme to launch a campaign, starting 1965 to establish new national training centres in the various countries of Africa or to improve the existing means of training, when necessary. A special team composed of training specialists will prepare curricula for uniform training programmes to be adopted at the national training centres. It is also envisaged to prepare plans for standardized establishments at the institutes including buildings, laboratory and teaching equipment, dormitories etc. adapted to the respective requirements.

36. For certain specialities, the utilization of regional training facilities will be more adequate, and some existing national training centres in Africa are already prepared to receive students from other countries. Such facilities should be utilized to provide specialization in particular fields of telecommunications which cannot normally be taken care of in an economical way by the national training institutes. Such special cases, would be for example maintenance, repair and calibration of measuring instruments, maintenance and repair of ARQ and radio telephone terminals and other similar cases where in every country only a reduced number of specialists is required.

37. Evaluation of the requirements and trends must be made at regular intervals throughout the period of the proposed development programme to achieve the most advantageous arrangements in the training procedures. Considerable outside help will be required for a period of 7 years in the form of instructors' services, funds and equipment for organizing the uniform training system, setting up or modernizing where required the national training centres and for getting the actual training courses started. During the implementation of this project, it will be necessary to maintain close co-ordination between the work which is already in progress in this connexion through ITU, through EPTA, the UN Special Fund and also through bilateral programmes. In the meantime, parallel steps should be taken to train instructors from the respective countries to fill the teaching posts in the training centres, as outlined below, in a gradual move towards self-sufficiency in this field.

Training Programme for African Telecommunication Instructors

38. While national training facilities are being set up or improved it appears also necessary to ensure that a qualified body of national teachers becomes available to conduct the courses in the future. A special project has been prepared with the aim of providing ultimately a permanent solution and to gradually overcome the dependency on foreign resources in this field by training telecommunication instructors from the African countries on a large scale.

39. The project provides for the training of a total of 450 instructors for the various fields of telecommunications in successive courses lasting each one four years. The courses are proposed to commence in 1965, thus the first group of 200 instructors could be ready to take up teaching duties in their respective home countries by 1969. Each year after, 100 more instructors should complete their training; the last study tour should comprise 50 instructors arriving at a total of 450 after a 7 year programme. These figures are of course subject to periodic revision to make any adjustments which may be required.

40. A separate document (Project ECA/ITU No. B-2) covers this proposed programme in detail including the curricula, conditions for the selection of candidates, time table, and different items of the financing of the programme. The cost of this project is estimated at slightly over US \$ 1 million per year. This sum is composed of travel, tuition, board and lodging, cost of the teaching staff and of the training equipment. In view of the relatively long duration of the courses a home leave trip for the students is envisaged at the middle of the four-year study tour to maintain contact with their home countries and to visit their families.

41. The ILO Turin Centre for Advanced Training in Italy seems to offer excellent prospects for conducting these courses with the possibility of making a start towards the end of 1965. Arrangements are in progress to organize the project as joint ECA/ILO/ITU enterprise under the technical responsibility of the ITU, and financial arrangements are being explored.

Management Courses and Seminars for
Directors of African Telecommunication Administrations.

42. With the growing demands placed on telecommunication administrations the responsibilities and duties of the directors and managerial staff are also growing. Telecommunication administrations are faced with policy decisions which require thorough consideration of technical as well as economic factors. Directors and managers of the telecommunication administrations must be in a position to take decisions regarding financial and economic aspects, as well as questions of adaptability of new installations and equipment, involving large financial commitments for their governments. They must also be able to organize the departments or sections which are under their responsibility so that the highest efficiency can be maintained when services are growing. With the anticipated development over the coming decade many new tasks and responsibilities will fall on the directorate staff of the telecommunication administrations particularly in view of the influence which communication systems have on the economic and social

development of the countries. Besides technical and managerial skills, a thorough knowledge of economic matters will be essential for officials, responsible for making government policy decisions.

43. It is therefore appropriate to devise special courses and seminars which will allow the personnel at the directorate level, already in service, to become familiar with the latest techniques and procedures. In view of the fact that prolonged absence of the senior staff from their duty stations is impracticable, these courses and seminars are scheduled to take place once a year in two different categories. One course will include lectures by specialists in telecommunications and economics and technical subjects as well as seminars to discuss topics of special interest. Visits will be arranged to various telecommunication administrations with particular emphasis on the policy making and managerial aspects. These courses are intended for director generals and managers as well as deputy directors of the telecommunication services and are scheduled to take 2 months every year. A second type of course is intended for heads of divisions or sections in the telecommunication departments and will comprise the regular management course of the ILO Turin Training Centre with special adaptation to the needs of telecommunication and will last six months every year. Courses will be held in English and French as required.

44. Document (ECA/ITU Project B-3) contains the details of the proposed project, which is considered of major importance for the future development of telecommunications in Africa ; an attempt will be made to start the first series of courses during 1965. It is estimated that there will be approximately 20 participants each year and that the comprehensive cost will be of the order of US \$ 50,000 p.a. The expenses can possibly be covered by a combination of contributions from the interested administrations as well as by outside aid.

Short-Term Training Programme for Technical Personnel

45. Independently of the three long-term projects considered above, it will be necessary to organize ad-hoc training facilities from time to time for specific needs. These needs are usually concerned with new equipment or new operational procedures. This will be particularly the case with the short-term programme for the telecommunication network (referred to in para. 4 to 17 with special reference at the end of para. 11). In most cases it is a matter of training technical personnel who is already working in the service. During the short-term programme it is proposed to send instructors, where required, to provide on the job training on an ad-hoc basis, until the local personnel can adequately operate or maintain the new equipment, or cope with new procedures. The time required for this may vary from case to case and no rigid programme can be set up.

46. It is therefore proposed to recruit instructing personnel who will be available at short notice to take up without delay the special training duties. It is also proposed to set up individual training units, for example for ARQ and telex equipment (automatic telegraphy exchanges), teleprinters, radio telephone terminals and others. With small investment equipment from different manufacturers can be installed at some existing training school and the technicians can be trained on the type of equipment which is utilized in their home countries. The number of instructors will be small and the training units can be set up and operated quite economically on a regional basis. Another means of solving short term requirements particularly for technical personnel who is already in service is to organize study tours, specifically adapted to particular needs,, of from 12 to 18 months in overseas countries. Such procedure was successfully applied during the emergency programme in the Congo and it is recommended that similar arrangements be made within this programme.

Publication of Technical and Administrative Texts and
Engineering Instructions Adapted to needs of
African Telecommunication Administrations

47. Concurrently with the proposed training project it is proposed to establish a special unit in Africa entrusted with the production of text books, publications of general interest and engineering instructions on telecommunications. This unit is also to act in an advisory capacity to the national training centres existing or being set up in the different African countries. While numerous text books on telecommunications can be found in various languages in the world market it is advantageous to introduce a certain uniformity in such texts particularly for the elementary training. This will facilitate the training of instructors and also their subsequent teaching. The unprecedented pace of development in telecommunication has also resulted in the publication of an enormous amount of scientific and technical literature which is so diversified that it is almost impossible to be selected and utilized for practical needs by the technician or administrator engaged in the telecommunication services. It is therefore intended to produce texts containing such information of direct interest to the personnel engaged in development, maintenance or operation of the telecommunication services and to make them regularly available to Administrations in a practical presentation.

48. The unit entrusted with publishing these texts should preferably be located in Addis Ababa as part of the ECA/ITU joint programme and work in close liaison with the International Consultative Committees of the ITU. These Consultative Committees produce important recommendations on telecommunication subjects which are generally used as a technical standard for the installations of administrations and operating agencies. They constitute normally also a basis for manufacturing equipment. In addition, many recommendations and special studies emanate from the Consultative Committees which are important for the operation of the telecommunication networks, including television systems and others. All such texts are of interest to the African

Telecommunication Administrations, and their publication in a form adapted for practical use has been repeatedly requested. The co-operation of UNESCO and of scientific and industrial institutions would also be most valuable for this project.

49. Concrete proposals for the publications will be made during the pre-investment survey in close co-operation with the CCITT and the CCIR as well as the Technical Co-operation Department of the ITU. An initial estimate indicates that approximately US \$ 100,000 a year will be required to carry out this project.

Chapter 3

PRELIMINARY ESTIMATES OF COSTS

AND PROPOSALS FOR FINANCING

(a) Costs

50. The total cost of the proposed ten-year programme is estimated at roughly US \$ 1000 million. The largest proportion - approximately 90% - will be absorbed by the implementation of the permanent pan-African telecommunication network and associated national installations. The remaining 10% will be required to finance the pre-investment survey for the permanent network, the comprehensive training programme and installations for short-term requirements. The total cost of this development programme would be distributed over some forty countries, and represents an average of about US \$ 2½ million per year, per country, over the suggested ten-year period. The actual investment in each country will of course vary according to its size and population. The over-all amount estimated will appear reasonable if it is considered that it will provide a significant step in an important field of development within a relatively short time for one of the largest continents. Telecommunications are normally self-supporting and can be profit-making if adequately planned and operated. They represent a vital support to all forms of economic development and have become a necessity in the modern life of the countries. In view

of the fact that the programme is conceived as a whole to provide ultimately a lasting and permanent solution for the telecommunication problems of Africa, it will be essential to ensure that adequate financial means be available to carry it out integrally. The breakdown of costs is shown in Annex I.

(b) Financing

51. One of the basic requirements for implementing the proposed programme is the availability of financial resources^{1/}. The countries will have to put up amounts in local currency and outside assistance will be necessary to cover the foreign exchange component, mainly for equipment. Part of the funds required to start the programme will have to be provided in form of grants in view of the financial difficulties which many of the African countries are facing at present. This will be particularly the case for the pre-investment survey, the training programmes and short-term circuit requirements. Existing buildings and other establishments not only represent positive national counter parts but in fact make it possible to solve short-term requirements in the proposed two year period. The short-term project will of course not provide a permanent solution to the problems and can only be considered as an integral part of the general plan.

52. The equipment and installations in the long-term programme represent the largest item to be financed with a total amount of about 900 million dollars out of which some US \$ 600 million will have to be financed in foreign exchange. The installations will become part of the national infrastructure and will represent a capital investment for which United Nations and other aid funds cannot be used. But means, particularly in foreign currencies, are also not presently available in the African countries for the large capital outlay which

^{1/} See Resolution No.24 of the ITU (International Telecommunication Union) Convention of 1959 and Opinion No.2 of the Regional Plan Committee for Africa of the ITU, Dakar 1962.

will be necessary for the installations. Countries will be able nevertheless to derive, later on, revenue from these installations and should therefore be in a position to pay for their cost in due time if the funds could be made available now. Under these conditions it seems essential for implementing the plan to create from the outset a financial scheme which will permit the countries to obtain loans for purchasing the necessary equipment and to proceed with setting up the installations after the survey and plans of operation are completed. Such loans should be available for repayment on a long-term basis, at low interest rate.

53. The administration of such financial scheme should preferably be entrusted to a centralized agency. The African Development Bank would be a most appropriate body to establish such a financial scheme which could make the form of a special fund, as provided for in their constitution. The establishment of a central administration is of particular importance for this co-ordinated continental development plan. Since most of the funds required will be for equipment, the participation in such scheme should be of particular interest to countries having telecommunication industries.

Conclusions

54. In the present document a comprehensive working programme is proposed with the aim of solving major problems in the field of telecommunication in Africa over the next decade. The importance which telecommunications play in other basic development aspects of the Continent makes it necessary to allocate highest priority to this work. Efficient telecommunication systems have to-day a decisive influence on the development of aviation, shipping, business and on the political life of the countries. In addition to the public utility rendered by an efficient telecommunication service, it will constitute normally also an important source of revenue for the government in local and foreign currencies.

55. As a starting point the large scale, continental telecommunications development programme—a Pre-investment Survey is to be carried out during 1965 and 1966 for the African continent. This survey will provide the necessary data and plans for the implementation of a complete pan-African trunk line system and for the improvement of existing national networks, to achieve ultimately a uniform level of development in all countries. At the same time a training programme is to be started to ensure the availability of qualified personnel when the new installations will go into operation. Since the implementation of such a vast programme will require a number of years, measures have also been proposed to take care of short-term requirements while the pan-African network is under construction. The working programme has been prepared to arrive at an integral solution and it is therefore necessary to complete every part of it.

56. This programme will serve to mobilize internal resources and will combine the facilities offered on bi-lateral and multi-lateral basis for progress towards self sustained growth as called for in the Resolution on the United Nations Development Decade. To meet the objectives laid down in the Resolution it will be necessary to double the telephone density in Africa over the proposed period in addition to establishing the trunk network which will interconnect the African cities both at the national and the regional levels. While the proposed working programme and time table contemplate the main items which are considered to be essential for its implementation, sufficient flexibility is left for adjustments to include requirements which cannot be foreseen at this time.

57. The responsibility for setting the basic concepts for planning and routing of the proposed telecommunication arteries as well as of the local networks lies with the governments and telecommunications administrations of the countries concerned in the Regional Plan Committee for Africa of the ITU. On the other hand the General Secretariat of the ITU works in close co-operation with the secretariat of the Economic Commission for Africa in devising and co-ordinating means for assisting the countries in the implementation of the programme.

TABLE No.1
(abridged)

DEVELOPMENT OF TELECOMMUNICATIONS IN AFRICA ** ECA-ITU SUGGESTED 10 YEARS PROGRAMME											
	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
<div>POLICY</div>	●	●	●	●	●	●	●	●	●	●	●
		●	●	●	●	●	●	●	●	●	●
<div>FINANCE</div>	●										
											●
											●
PROGRESS EVALUATION	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
<div>NETWORK</div>											
								</			

PRELIMINARY ESTIMATES OF COSTS FOR THE AFRICAN TELECOMMUNICATION PROGRAMME

A. AFRICAN TELECOMMUNICATION NETWORK (see Chapter 1)

Part 1 : Short Term Programme (See paras 4 to 17) US Dollars

Included in this item are High Frequency radio telephone and telegraph circuits, tropospheric scatter links, low capacity VHF links and improvement of existing overhead lines, as well as terminal equipment and small telex exchanges. A total sum has been estimated including installation and training of personnel at 25,000,000

Note : (A practical approach for providing the various types of equipment had been suggested in ECA Document E/CN.14/249 by pooling resources to make equipment available at short notice to those countries which cannot provide it presently with their own means.)

Part 2 : Long-Term Project (See paras. 18 to 31)

This project comprises :

- (a) Economic and technical Pre-Investment Survey to be conducted in 1965 and 1966 covering all African countries. This survey is composed of two parts (i) a general survey and (ii) detailed propagation and routing surveys. The general survey which is expected to be financed by the UN Special Fund is estimated to cost 1,700,000

(See Project A-2 for details) Detailed propagation and routing studies will be determined by the general survey. They will normally be carried out by Consulting Firms under contract and it is expected that this item will be covered from bilateral aid. An initial estimate for the cost of this work is 3,000,000

US Dollars

(b) Pan African telecommunication trunk line network consisting of wide band transmission channels between the various countries, throughout the continent, carrying hundreds of simultaneous telephone channels, teletype channels for multiple applications, television channels, data transmission facilities, etc. Only a rough estimate can be made at present prior to the pre-investment survey. Assuming 30,000 kilometres of trunk routes to be used as interconnecting telecommunication arteries between countries and also as main arteries within the countries for national use, indicate a cost of the order of

450,000,000

(The above estimate is based on a cost of US \$ 15,000 per kilometre including equipment, buildings, approach roads and other civil engineering work)

(c) Terminal installations and telephone exchanges in the countries. Together with the African trunk lines system, national installations have to be improved and the number of telephones has to be increased in many countries in varying degrees to arrive at the proposed uniform level of development. Preliminary estimates indicate the following requirements. Improvement of telephone and doubling present capacity, approximately

300,000,000

150,000,000

Terminal installations (telex and others)

Note: About 2/3rds of (b) and (c) will be required in foreign currency and 1/3rd in local currency.

US Dollars

B. TRAINING (See Chapter 2, paras. 32 to 49)

- (a) Establishment of national training institutes including equipment and instructors. Foreign exchange component estimated at US \$ 1,000,000 per institute.
For 21 institutes

21,000,000

(According to similar projects of the UN Special Fund there is in the average a counterpart in local currencies for each institute of UN \$ 1,800,000 to be estimated. The amount is indicated here only to give an expected order of magnitude ; precise requirements will be established by the pre-investment survey).

- (b) Courses for 450 Instructors (Project B-2)
estimated for 7 years, total

7,600,000

- (c) Courses on Management (Project B-3)
20 participants per year, for 10 years

500,000

- (d) Special Publications
Estimated at US \$ 100,000 p.a.

1,000,000

The total cost of the proposed 10 year programme is of the order of US \$ 1,000 million
(See para. 50 of the report)

This represents the order of magnitude of the cost of the programme but more accurate figures will only be available after completion of the pre-investment survey.