No. 4

BASIC DESIGN STUDY REPORT ON REHABILITATION AND EXPANSION PROJECT OF UGANDA TELEVISION IN THE REPUBLIC OF UGANDA

JULY, 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

BASIC DESIGN STUDY REPORT

ON

REHABILITATION AND EXPANSION PROJECT OF UGANDA TELEVISION

IN

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PREFACE

In response to the request of the Government of the Republic of Uganda, the Government of Japan decided to conduct a Basic Design Study on the Project for Rehabilitation and Expansion of Uganda Television Network and entrusted the Study to the Japan International Cooperation Agency (JICA). JICA sent to Uganda a study team headed by Mr. Kenzo Hirata, Deputy Director of Radio Monitoring and Control, Radio Department, Telecommunications Bureau, Ministry of Posts and Telecommunications from January 26, 1985 to March 3, 1985.

The team had discussions on the Project with the officials concerned of the Government of Uganda and conducted a field survey. After the team returned to Japan, further studies were made and the present Report has been prepared.

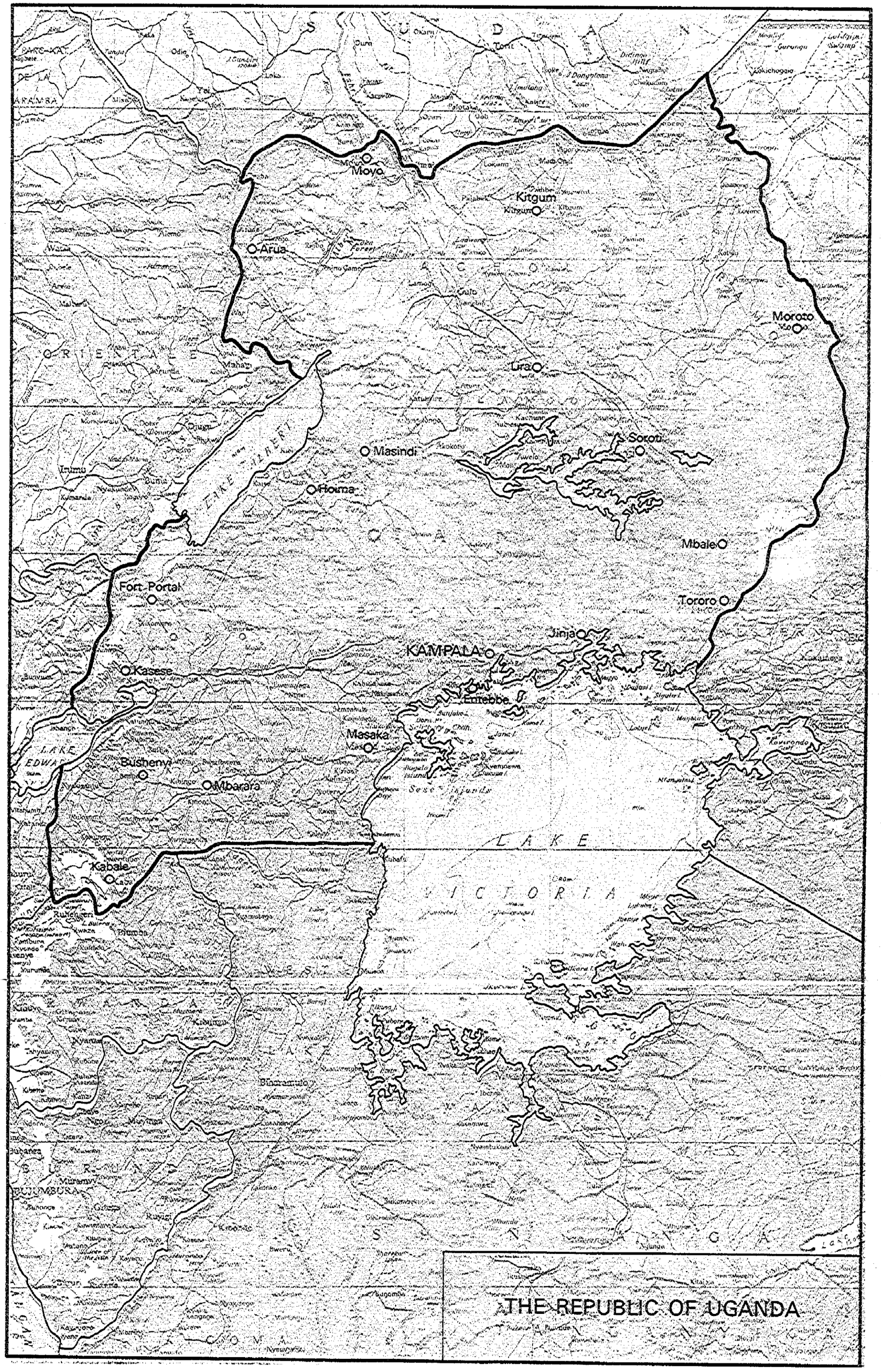
I hope that this Report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Uganda for their close cooperation extended to the team.

July, 1985

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency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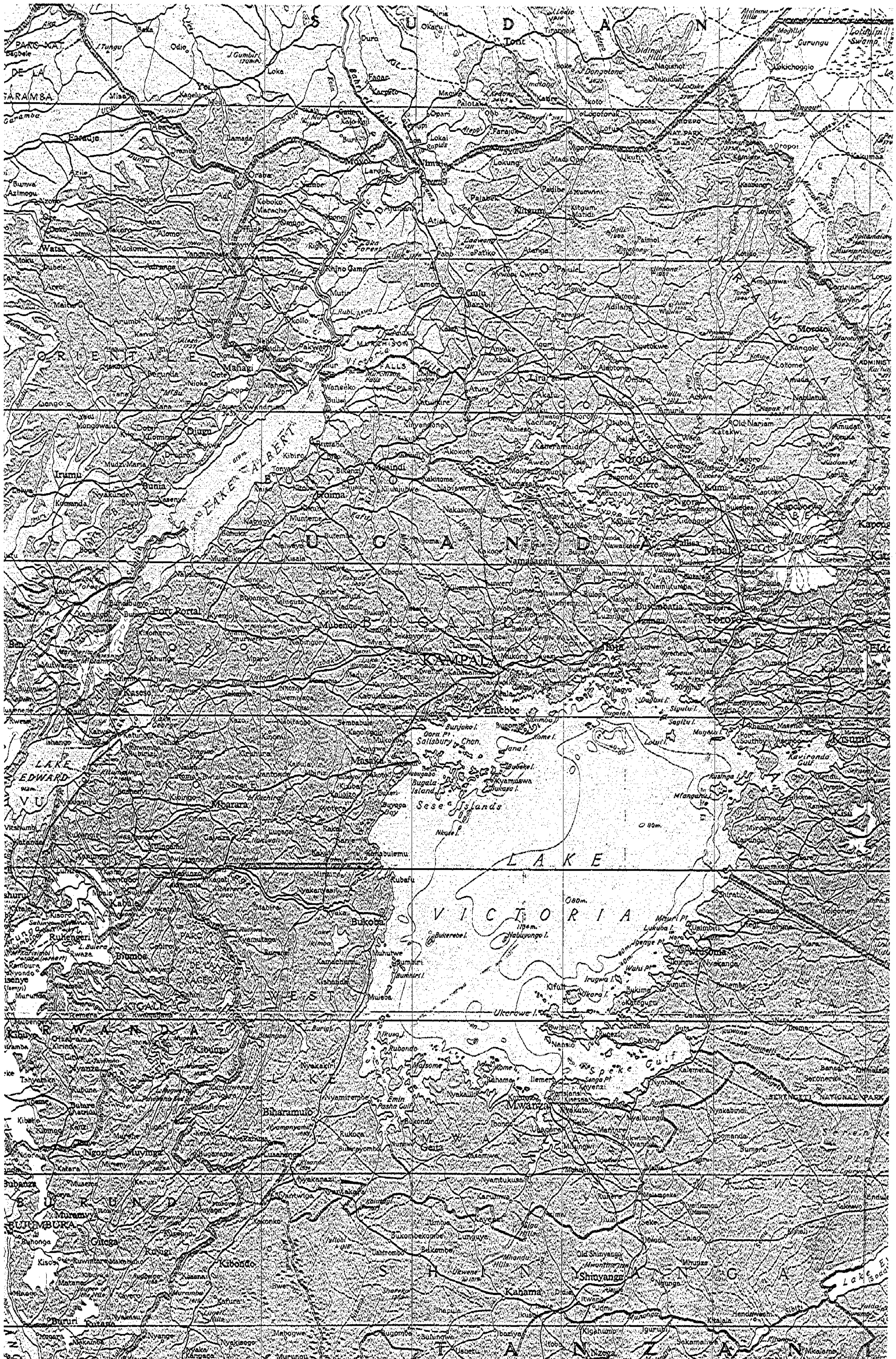
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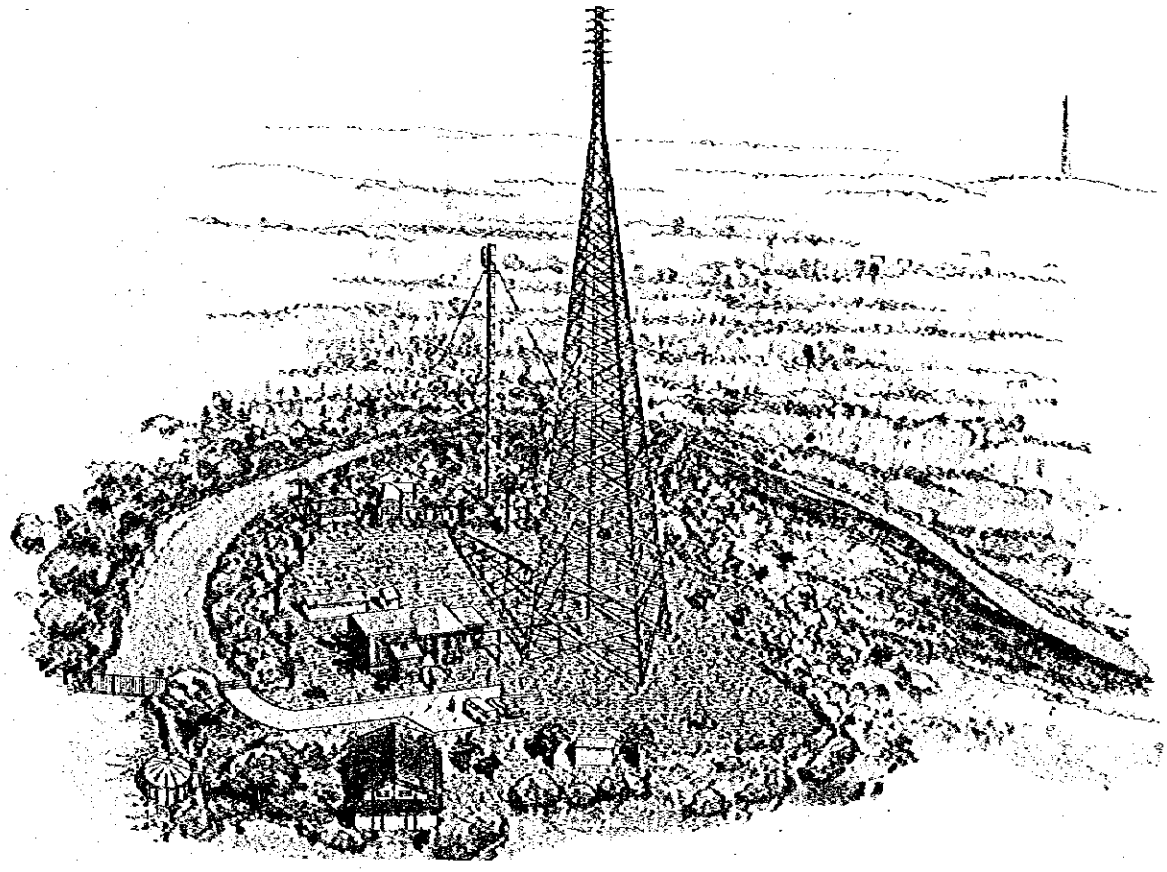
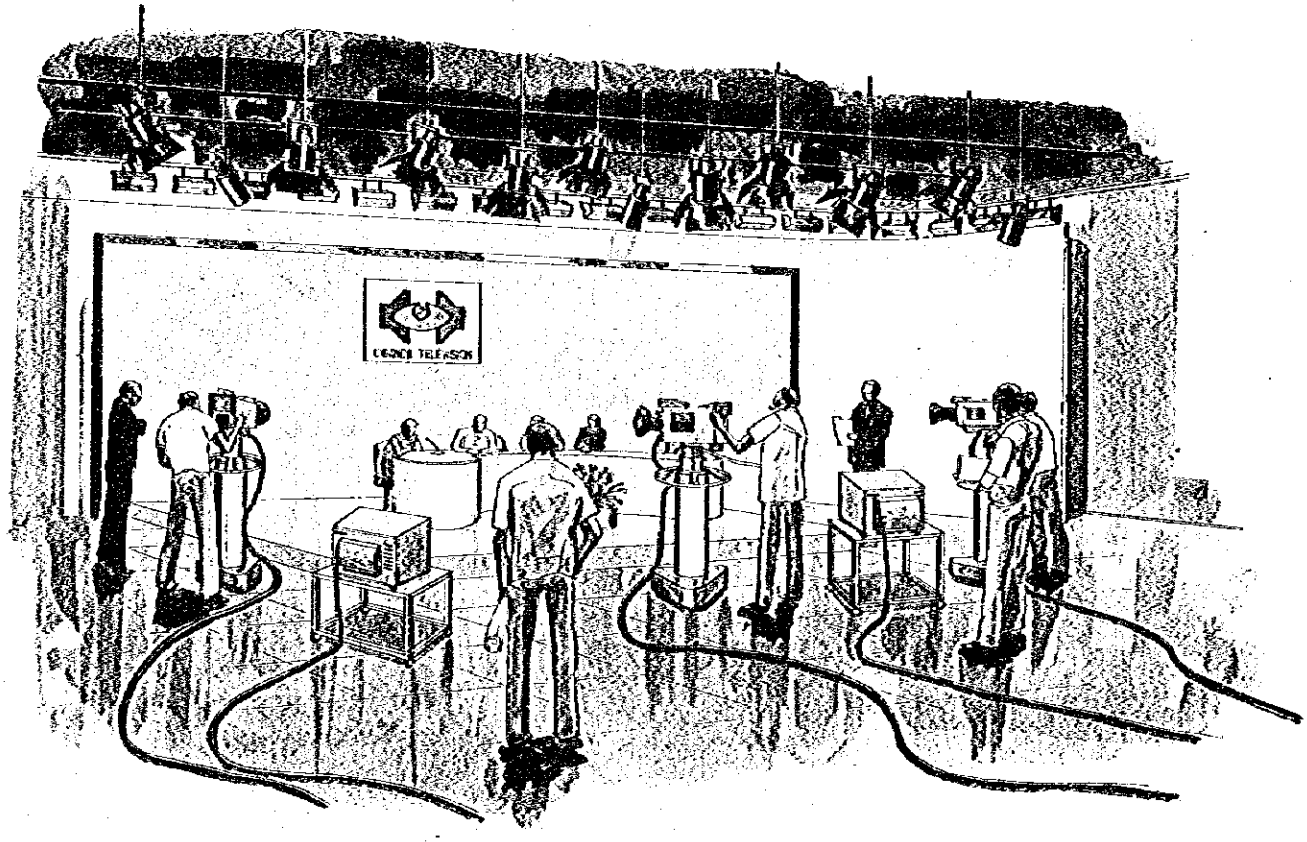
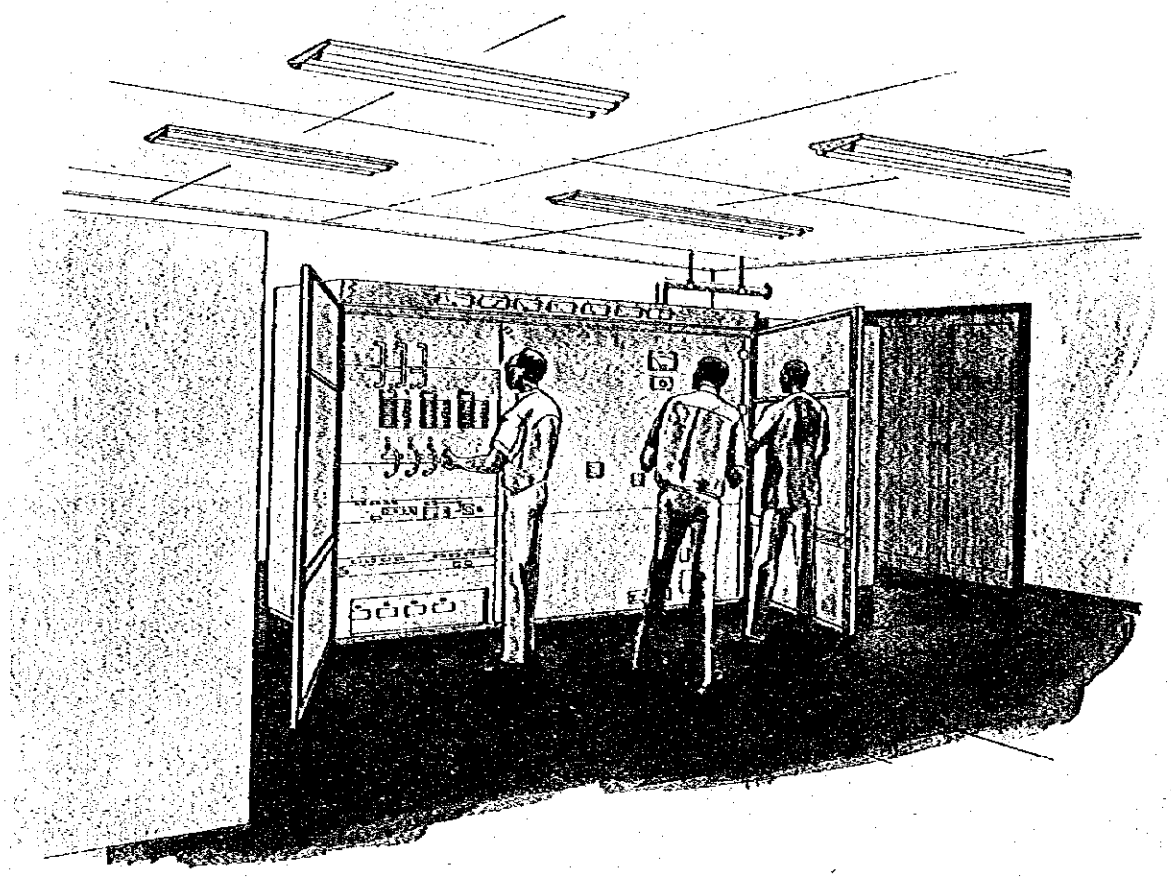


Kololo Transmitting Station



Programme Production in Studio B



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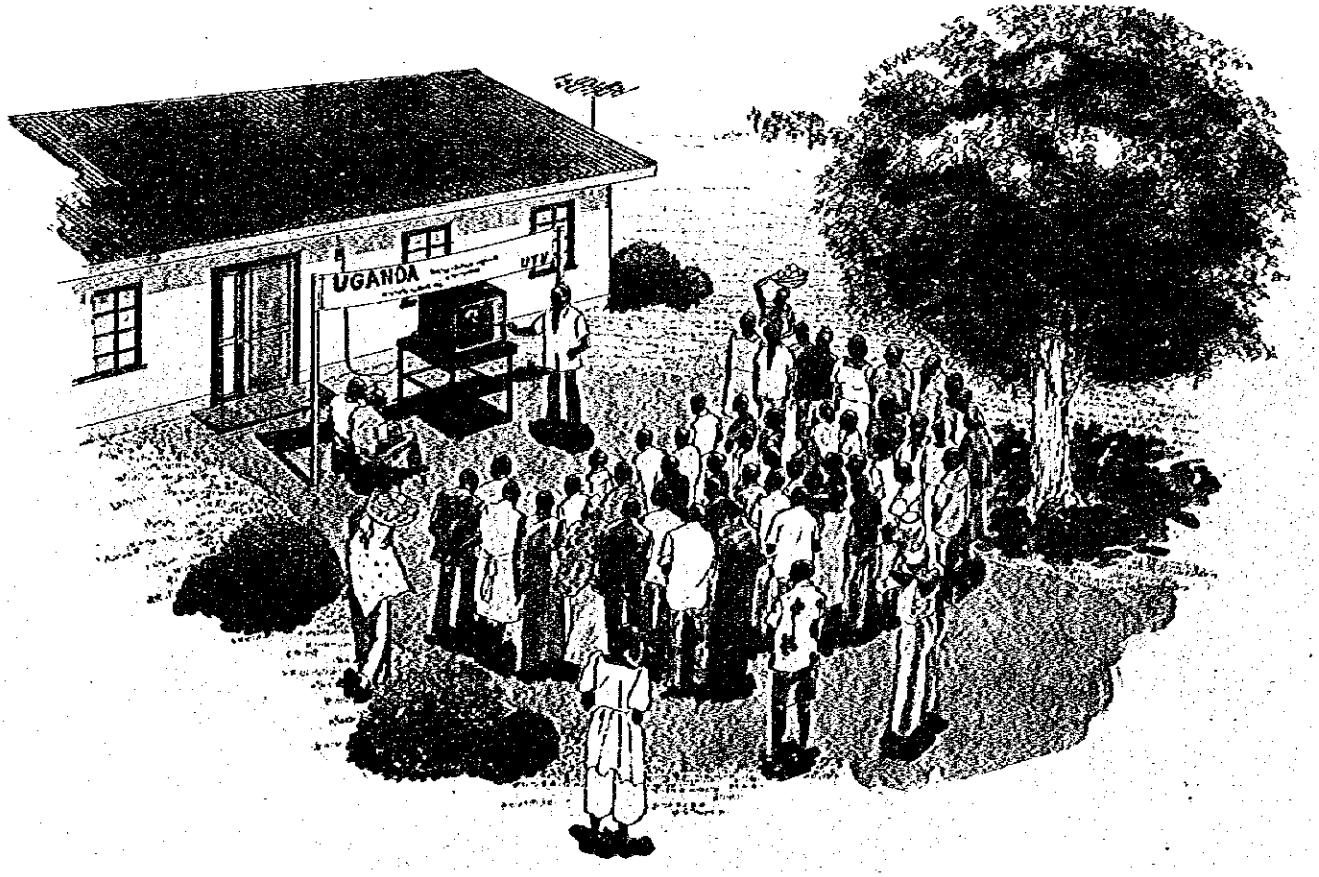

Watching TV at Social Centre

SUMMARY

SUMMARY

The Republic of Uganda is now making strenuous endeavors to restore everything to the "level in the glorious 1960s" and paves the way for further development under its top priority of the national policy.

Marks left by Uganda's revolution war of the 1970s are still seen everywhere in the country, and the influence are clear from social infrastructure including various buildings and facilities, and also still remain a blight over the people's minds and daily lives.

They can also be seen in the area of broadcasting and communication services. In particular, TV broadcasting service, which registered a coverage of 65% of the total population in the 1960s , now covers the capital city of Kampala and a small portion of its neighboring area. Its coverage now has dwindled to a meager 8% owing to the destruction of broadcasting facilities in the 1970s and to the superannuation of facilities and a continued shortage of spare parts that followed.

Similar traces are also observed in the telephone and radio broadcasting service. There is a virtual absence of constant information flow from the capital to rural areas or vice versa, although a slender one-way flow of information from Kampala to rural areas is maintained with a time lag.

The Ugandan Government is eager to promote school and social education by TV broadcasting by making use of its power to "appeal directly to the visual sense of the audience" in an effort to enhance its human resources development scheme and build the basis for the future national development.

At present, school broadcasting programmes produced by the Kampala Station or procured from abroad are broadcast on an irregular basis. Owing to the delayed rehabilitation of the TV broadcasting network, however, these programmes can cover only Kampala City and surrounding areas.

It was from this view point that the Ugandan Government formulated a rehabilitation and expansion project of UTV network as one of its top priority policies to restore the "power" of TV broadcasting service which it once owned in the 1960s and to repair the vestiges occurred in the 1970s, and in order to realize that, requested Japan to cooperate in the project by offering grant aid.

At present, TV broadcasting service in Uganda covers only the capital city of Kampala and a portion of its surrounding area. The Ugandan Government request for Japan's cooperation is basically aimed at restoring the present TV coverage to the level in the 1970s (65%), and its rehabilitation and expansion project of UTV network was formulated for attainment of this coverage increase.

Acceding to this request, the Japanese Government undertook to conduct a basic design survey and entrusted Japan International Cooperation Agency with its execution. The Agency sent a basic design survey team to Uganda during the period from January 26 to March 3, 1985.

During its stay in Uganda, the team studied the existing state of TV broadcasting service in Uganda, ascertained the contents of the project, investigated transmitting stations and studios in Kampala and other major cities, and had series of discussions on the contents of the Project etc. with the competent Ugandan authorities.

After its return to Japan, the team reviewed the findings of its field survey and analyzed all relevant data collected in Uganda, and reached the conclusion that rehabilitation of the following facilities by the Project would be desirable.

(1) Rehabilitation of transmitting stations

1) Kampala Transmitting Station

Transmitter, tower, antenna, and peripheral facilities

2) Soroti Transmitting Station

Transmitter, tower, antenna, and peripheral facilities

3) Lira Transmitting Station

Tower, and antenna

4) Masaka Transmitting Station

Off-air receiver

5) Mbarara Transmitting Station

Off-air receiver

(2) Rehabilitation of Nakasero Station

Rehabilitation of the Studio B facilities, main control room, STL, ENG system with vehicle and peripheral facilities.

The Ugandan Government is now carrying out a TV network rehabilitation plan financed by Japanese debts relief grant (Japanese DRG) together with its own fund. When this plan and the project to be financed by the Japanese grant aid are both completed, it will become possible to put all transmitting stations in major cities into service and attain the aforementioned target coverage of 65%.

The rehabilitation plan of TV network conducted with Japanese DRG with Uganda's own fund will cover mainly the western district (Masaka, Mbarara and the eastern district (Mbale), while the project to be financed by the Japanese grant aid will cover the capital city of Kampala and the northern district (Soroti and Lira).

The coverage increase to and beyond the "level in the 1960s" under the project is certain to produce an immense impact in all areas on national rehabilitation activities.

In particular, when the human resources development scheme, which is the basic and impending need for Uganda's national rehabilitation and development, is set on the right track under the project, it will undoubtedly brighten the future of Uganda by producing a synergetic incentive effect with the high morale and capabilities of the Ugandan people and the abundance of natural resources the country is favored with.

The Government is now making maximum efforts to promote education by appropriating 20% of national budget each year. Reinforcement of school and social education by the revived TV broadcasting service will yield a tremendous promotional impact on Uganda's national education scheme cojointly with regular school education.

Reeducation and training of the entire staff of the UTV (Uganda Television) in advanced technology is essential for ensuring effective operation and maintenance of the new broadcasting facilities and for producing high-quality programmes. It deserves attention, however, that under the TV network rehabilitation plan carried out with Japanese DRG and Uganda's own fund, major local transmitting stations having been interrupted for more than ten years in the past are now given maintenance service and engineers are also assigned to such stations, with some of them given training already.

Judging from the technical level, organization and high morale of the UTV's technical staff, it can safely be said that they are competent for it will be encountered in the maintenance of the new broadcasting facilities after the project completion.

CONTENTS

CHAPTER 1. INTRODUCTION

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The Republic of Uganda, a country rich in verdure and called the "Pearl of Africa" is situated right on the equator, with its entire territory forming a plateau having an average elevation of 1,200 m. It is a farming country blessed with plentiful rainfall and a mild climate throughout the year. It is also one of the few African countries self-sufficient in food.

The country gained its independence in October 1962. By the Government's endeavors, Uganda's TV broadcasting service registered a coverage of about 65% of the total population in the 1960s and its future appeared very bright and promising. In the 1970s, however, the military regime then in power enforced a hasty "Ugandanization" policy and the revolution war that followed resulted in the destruction of many buildings, facilities and organizations, leaving marks seen today as a blight cast over the people's minds.

TV broadcasting facilities, not exempted from the affect of the revolution war, were subjected to the subsequent superannuation and a continued shortage of spare parts. As a consequence, Uganda's TV broadcasting service is operated only in two cities at present, Kampala and Jinja, and its coverage is less than 8% of total population.

Infrastructural facilities which provide the basis for the people's daily lives are heavily dilapidated because they have been left intact without any improvement work for more than ten years in the past. On the whole, however, the country is now pursuing a steady course of rehabilitation, and things are turning for the better as evidenced by the gradual recovery of domestic demand, increase of foreign aids, and the return of increasingly many Asians and Europeans who played an important role in the country's economic development in the 1960s.

Human resources development based on accelerated promotion of education is an essential prerequisite for Uganda's economic

rehabilitation and development. In due recognition of this fact, the Ugandan Government formulated its rehabilitation and expansion project of UTV network to promote school and social education by revitalized TV broadcasting service in parallel with regular school education, and requested Japan's grant aid to implement the project.

Complying with this request, the Japanese Government sent a basic design survey team headed by Mr. Kenzo Hirata, Telecommunications Bureau of the Ministry of Posts and Telecommunications, to Uganda through Japan International cooperation Agency during the period from January 26 to March 3, 1985.

Basic development items mutually agreed upon during the discussions between the team and the competent ugandan authorities were laid down in the Minutes of Discussions signed, and exchanged between the two parties (See the appendix for the Minutes of Discussions).

After its return to Japan, the team examined and analyzed its survey results and prepared the basic design for the project which is presented in this basic design survey report.

CHAPTER 2 BACKGROUND OF THE PROJECT

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2-1 Natural Condition

The Republic of Uganda is an inland country with the total population of 14,280,000 situated in the east of Africa, spreading about 240,000 km^2 in area (close to two thirds of Japan) from long. 29° 34' E to 35° 02' E and from lat. 04° 14' N to 01° 29' S.

Uganda is bordered on the east by Kenya, on the west by Zaire, on the south by Rwanda and on the north by Sudan.

In the southern part of Uganda, there is Lake Victoria, the third largest lake in the world, (the water level is about 1,220 m above sea level and the deepest of the bottom is 80 m.) starting from which the Victoria Nile runs through the country.

The majority of the country being plateaus, 1,200 to 1,300 metres high, is favoured with mild climate and sufficient precipitation. However, in the south west areas and border areas, there are a number of mountains. The area bordered by Zaire in particular is characterized by complicated topography with mountains and valleys. (Climatic condition such as temperature, humidity and precipitation are given by areas in the Appendix.

2-2 General Social Condition

Among many African countries suffering from food shortage, Uganda is one of a few countries that are supplying themselves with food.

The major industry in Uganda is agriculture with farm products continuing to account for close to 50% of the GDP since its independence, and 95% of the total population is farmers.

Since the independence, the economy in Uganda has been marked by " mono-culture economy" which is dependent on coffee and cotton. Especially in recent years, coffee has been predominant in farm products.

These primary products cause a great fluctuation in the production and price by such external factors as climatic condition, planted acreage, harvest or production etc., in competitive exporting countries.

In order to cope with such fluctuation, the government has come a long way in getting rid of mono-culture, but they have gotten only minor results.

Having gone through numerous strifes and conflicts against Great Britain, a former suzerain state Uganda became independent in October 1962, and in 1971 the then president Obote was dropped the reins of the government by the military regime. Hasty Ugandanization executed by the military regime and resultant revolution war and disturbances hit hardest the domestic economy to destruction.

Non-Ugandans of Asian people such as Indians and Pakistanis have lived in Uganda and been engaged in economic activities for many years, they had come to grips with nearly all commodity distribution there. But they left Uganda in August 1972.

The Asian merchants had had a reign over more than 80% of retail, 30 to 40% of wholesale and the majority of textile, sugar, galvanized iron plate and electrical appliances industries, a situation which leads us to assume what serious impact Ugandanization had exercised upon the Uganda economy.

For 10-odd years since 1971, none of improvement of infrastructure such as roads, waterworks, electric power etc., has been made.

Since 1980 when Mr. Obote was re-elected as president, Uganda has been doing its best for across-the-board recovery of the country, but it apparently takes time to get the country back into good shape. The recent economic conditions reveal that the GNP has advanced, that the left foreigners (Europeans and Indians) have returned and resumed their economic activities, and that security has returned to normalcy. All this indicates that the country is on the right track for recovery.

2-3 Infrastructure

(1) Electric Power

The majority of electric power in Uganda is supplied by the Jinja hydroelectric power plant. It is planned to increase the present power generation capacity of 150 MW. (Of 150 MW, 30 MW is sold to a neighbouring country, Kenya.)

The 132 kV or 33 kV power transmission lines are installed through most of the major cities. The expansion plan is underway. During the Team stay in Uganda about 27 days, there was a power failure which lasted for about 40 minutes in Kampala and also in Mbarara, failures of power supply for two days in a row.

(2) Telephone

In local cities, magnet-type telephones are still in use. The telephone facilities have become deteriorated in no small measure, making telephone call between cities difficult and next to impossible, though there is not much trouble within cities. Even in Kampala, people have about the same trouble.

Including domestic microwave links, "rehabilitation" as a whole has been in progress, indicating a future prospect for gradual improvement of telephone circumstances.

International calls are relatively easily transmitted via communication satellite from the earth station nearby Kampala, but people have to wait for some times after request.

(3) Water Supply

Deterioration of water supply facilities has gone so far as to create places where water does not come from the faucets even in Kampala. When it comes to water supply, however, there is no problem with its water sources, since there are a number of abundant water sources in the country including Lake Victoria.

Though there are restrictions of hourly water supply in major local cities, it is possible in principle to utilize the abundant water sources.

2-4 General Condition of Television Broadcasting

2-4-1 Organization and Management

Both television and radio broadcasting in Uganda are under the control of the Ministry of Information and Broadcasting. Though the television and radio broadcasting stations are state-run, advertizing programmes are broadcast with charge.

The UTV consists of the Programme Department, Technical Department, and News Department, and manned by about 210 persons as of 1985. The organization chart of the Ministry of Information and Broadcasting is as shown in Table 2-2 and the lists of UTV staff are shown in the Appendix.

2-4-2 Transition of Television Broadcasting

Television broadcasting, which started in October 1963 in Kampala, capital city, has been solely operated by Uganda Television (UTV). In the latter half of 1960, television broadcasting had been put on the air and such major cities as Masaka and Mbarara in the west, Mbale, Soroti and Lira in the northeast. In the local cities where such transmitting stations are located, there is the district administration which constitutes the centre of politics, economy and community. The coverage has reached up to 65% of the entire population. (Ref. Fig. 2-1.)

Since the total population of Uganda in 1969 is about 9,530,000 persons, the coverage of 65% works out to be 6,200,000 persons. The size of population covered by each transmitting station can be worked out to be as follows from the coverage.

Kololo Transmitting Station:	21.3%	2,030,000
Mbale Transmitting Station:	8.9%	850,000

Soroti	Transmitting Station:	13.9%	1,320,000
Lira	Transmitting Station:	4.4%	420,000
Masaka	Transmitting Station:	5.7%	540,000
Mbarara	Transmitting Station:	10.8%	1,040,000
Total:		65.0%	6,200,000

The grand total data in the population is included in the Appendix.

Marks caused by the revolution war in the 1970's had affected television facilities. In addition due to equipment deterioration and shortage of spare parts, television broadcasting is being continued to serve Kampala and Jinja and their neighbouring areas alone. This means that only about 8% of the total population or 1,140,000 persons are covered. (Ref. Fig. 2-1)

2-4-3 Television Receiver Set

In Uganda, TV receiver sets are generally supplied by the International TV Sales Corporation (ITS). More than 100,000 sets were sold from 1963 to 1980. After the revolution war, about 5,000 sets were sold up to now.

Although TV service is limited in Kampala, Jinja city and their suburbs only, the inhabitants who live in the area where the TV service was made in 1960s, own the sets. It is believed that approx. 50,000 to 60,000 sets have been kept in the whole country. In Kampala, Jinja and their neighbouring areas, the number of TV receivers capable if receiving broadcasting is estimated at about 30,000 sets.

The price of colour TV receiver of 14-inch is about ¥ 150,000. As the monthly wage of an average public officer is ¥4,000 to ¥5,000, an ordinary family cannot afford it. Therefore, the community reception at social centre, school, meeting hall etc., will be necessary. At present, UTV urges ITS to supply TV sets for schools and these public institutions giving priorities over them.

The diffusion of TV sets is now hampered and forms a vicious circle, due to the economic reason mentioned before, shortage of broadcasting facilities, limitation of service area (Kampala city and suburbs), difficulties on producing enchanting and contented programmes. However, TV sets will be diffused to large extent among the people who get a certain amount of income, after the expansion of service areas increase of broadcasting hours and improvement of programme contents, by this grant aid project. These are the same as in the schools, social centres and other public institutions. In conclusion, the expansion of service areas, and improvement of broadcasting programme, will hold the key to accelerate the diffusion and expansion of the community reception.

2-4-4 Technical Ability of UTV Staff

UTV technical staff have a strong desire for promoting maintenance and administration works of TV equipment and facilities with superior technical capabilities, however due to the shortage of spare parts, (it is extremely difficult to secure spare parts because they have become old-fashioned and production has been discontinued for financial reasons.) they are in an impossible position. The realities are that they are forced to suspend broadcasting due to lack of spare parts, once failure occurs.

With regard to the broadcasting programme, since it is difficult to produce sufficient programmes because only one studio is barely available in Kampala station, more procured programmes such as documentary films etc. from foreign countries are broadcast than self produced ones. Despite such difficulties, however, UTV has been active in producing educational programmes in view of their importance.

2-4-5 Educational Broadcasting and Educational System

TV broadcasting plays an extremely important role in such across-the-board fields as expanding and improving education, advancing economic social life, increasing welfare of the people and rapid public delivery of the government policies especially when it comes to a developing country like Uganda. Improvement like this is a national issue for Uganda. On the recognition that fostering of competent men plays an

extremely important part for a developing and resurrecting country, the Ugandan Government places much emphasis on education. A typical example is this.

Of the total national budget, 20% is allocated for education. In other words, $6,737 \times 10^6$ Uganda shillings of the total national budget of $32,573 \times 10^6$ Uganda shillings was earmarked for education for the fiscal year of 1982 to 1983. ("Summaries of the Republic of Uganda" issued by the Japanese Ministry of Foreign Affairs) With such a large amount of budget appropriated for education, the Ugandan Government has been making efforts to build schools, foster and increase teachers, and improve and spread education. As a result, the number of primary school children increased to 1,690,000 in 1984 from 1,290,000 in 1980. (Statistics issued by the Ugandan Government. Details are shown in the Appendix.) The Ugandan Government are getting gradually results.

The realities are that due to shortage of competent teachers and school facilities, improvement has not made headway as expected. As effective means to work out such a problem, improvement of school education and adult education by TV programmes is arresting attention. To be more exact, UTV is producing educational programmes such as biology, physics, languages etc., with the use of their insufficient TV programme production facilities and broadcasting irregularly twice or three times a week. It is expected that the TV education becomes more effective according to the rehabilitation of TV network by the Project.

The education system in Uganda consists of seven-year junior education, six-year senior education and three or four higher education including universities. The compulsory education is still insufficient. About 50% of all the children of school age is attending in primary schools. (Quoted from "Summaries of Republic of Uganda" in 1980, issued by the Japanese Ministry of Foreign Affairs)

Of these primary school pupils, about 30% goes up to senior schools, the majority of them finish school in four years and about 10% of them take a national examination, and they are qualified for entering Makerere University or designated foreign universities. About 5% of the senior school graduates enter an university.

At primary and junior schools in Kampala, lessons are given in two shifts due to the lack of school facilities and teachers. The Ugandan Government is drafting improvement plan of the TV broadcasting network with their own fund and Japanese Debt Relief Grant (Japanese DRG) in order to recover functioning of the currently suspended broadcasting at major local stations and establish beneficial means of information transfer. Even the plan has been executed to the full, the TV network is insufficient both in terms of broadcasting areas and broadcasting facilities and far from the condition of TV network at the end of the 1960's.

2-4-6 Tribal Language and Local Programme Production

Official language in Uganda is English, however, still many tribal languages are used in each area (there are more than 10 major different tribal languages.), many people find it difficult to follow what is going on in TV programmes which Kampala station broadcast using mainly an official language, English. For the reason, the UTV staff are expecting to produce local TV programmes using each tribal language. In order to realize this object, UTV is desirous of executing improvement work of local studios.

2-5 Present State of Television Broadcasting

2-5-1 Broadcasting Programme

Television broadcasting in the Republic of Uganda is performed by Uganda Television (UTV) attached to the Ministry of Information and Broadcasting. UTV broadcasts 5 hours 20 minutes on weekdays and for 6 hours 20 minutes on Saturdays and Sundays by PAL-B colour television system.

The broadcasting programme schedule is determined every two to four months however, there are many changes in programme composition and in addition, the time scheduling is not regular.

The broadcasting times are generally as below.

Monday to Friday	6:00 pm - 11:20 pm	5 hrs 20 min
Saturday & Sunday	5:00 pm - 11:20 pm	6 hrs 20 min
Weekly total		38 hrs 20 min

Broadcasting time in Japan is different by each station, however it is generally for about 18 hours each day, beginning at around 6 a.m. and continuing until 1 a.m. the following day. The broadcasting hour of Uganda television are about 1/3 that of Japan, mainly due to the insufficiency of studio facilities.

The weekly schedule of broadcasting programmes (from January 20 to April 30, 1985) is given in detail in the Appendix and the classification of the programme contents is given below.

News	15% - 20%	(at 9:00 p.m., 11:00 p.m. etc.)
Education	35% - 40%	(Our Dances, Solar System etc.)
Entertainment	25% - 30%	(Pop in Germany, City Game etc.)
Sports	15% - 20%	(Gilette Soccer, Football etc.)

The format of news programmes has a 5 min bulletin at the beginning of the broadcasting time, to provide a brief introduction on the events of the day. More detailed information is given in the 15-minute news programme at 9:00 p.m., while a summary of the events of the day is given in another 5-minute bulletin before closing down time.

However, the content of these news programmes is such that there are many instances of merely headlines being shown on screen, or of simple announcements. There is a partial insertion of some ENG collected material but there is none of the variety that characterizes news programmes in Japan.

As for the school broadcasting programmes, natural science and language lesson are broadcast for thirty minutes every day from Monday to Thursday, these programmes include films and video types produced in foreign countries.

Their own programmes are produced in Nakasero Studio and with ENG (outdoor) by simplified method.

UTV is planning to transmit more school broadcasting programmes one hour in the morning and one hour in the afternoon from Monday to Thursday but it is not realized due to the lack of facilities.

The programmes for agriculture, industry, health and welfare are broadcast as general cultural ones.

Almost all entertainment programmes such as comedy show, music are imported, however traditional music and dance programmes are sometimes produced by UTV's ENG.

Sports are usually introduced in the news but some foreign sporting events are also broadcast. However, immediacy of programme transmission is not expected as they are delivered and supplied in the form of taped programme and not by satellite relay.

2-5-2 Programme Production and Transmission

General programmes are produced at Studio David only, and about four programmes are made each day. However, production can only be carried out in the daytime since the studio is occupied in the evening for live news programmes etc.

Accordingly, it is necessary to complete the production of 30-minutes programme within one hour and a half, which means that the available time for one programme is only 1/2 to 1/3 of that in Japan.

Moreover, it is necessary to complete 6 programmes in a day when educational programmes are produced.

The facilities at Studio David are grossly inadequate with only two cameras where three should be provided. Also, one of the two cameras has unstable operation and results in poor pictures. Only four or five lanterns can be used and other peripheral equipment are only one VTR for playback and recording, and one telecine chain.

Under such circumstance there is no choice and inevitably it limits the amount of programme production, and furthermore simplifies

the method of production, such that studio sceneries are of varnished timber, with a square table and chairs, and a blackboard. Hence it cannot be said that they are suitable sets for television. The process of programme production involves little prior meeting, and practically all programmes go into final shooting with little or no rehearsal.

As the result, the programme content is simplified with little variation, and it becomes unattractive together with its poor video and audio quality.

Production is also carried out by the ENG system to supplement the lack of studio facilities. Actually some educational programmes are shot using the wall of the courtyard as a backdrop the our inspection of the survey team. Picture shooting is completely different from ordinary method conducted at the location, although their efforts are appreciated, however such a method presents problems as far as raising the level of programme effect is concerned.

In order to supplement the insufficiency of programmes for broadcasting, recorded movies etc., are borrowed free of charge from foreign embassies and groups, and the number of such programs outnumbers the number of programmes produced locally by the Uganda Television Station.

In Africa there is the URTNA (Union of National Radio and Television Organization of Africa), union of broadcasters and it has the Programme Exchange Centre as one of its affiliated organizations. Uganda is also federated and programmes are exchanged between the member countries even though insufficient in quality and quantity, and if UTV want to purchase foreign programmes, it is required to pay considerable amount of foreign currency and so there is difficulty in this aspect.

Uganda is one of the countries that is making strong efforts to procure educational programmes as well as general programmes but the insufficiency of foreign currency results in the present state of non-realization of this goal.

There is a satellite earth station on the outskirts of Kampala which is used for the reception of foreign news etc., but for example, the receipt of news from London requires payment of foreign currency which results in difficulties in receiving transmissions everyday.

Considering the importance, progressive measures are taken for the production and transmission of education programmes, however insufficient results are obtained due to the lack of facilities.

An example of the weekly programme schedule of broadcasting from February 18 to 24, 1985 is classified as follows:

VTR broadcasting	(Taped)	25.8 hrs (67.0%)
Studio broadcasting	(Live)	7.2 hrs (18.5%)
Telecine broadcasting	(Film)	5.6 hrs (14.5%)

What is conspicuous here is the relatively large proportion of telecine broadcasting compared to that in Japan. NHK and other broadcasters rarely broadcast film programme directly by loading film into telecine devices and most being recorded onto videotape and then broadcast.

Programmes self-produced by the UTV staff include the news programmes, discussion programmes as the major ones, but these do not occupy more than 25% - 30% of the total hours for broadcasting.

From a survey of this present situation, it can be easily seen that the construction of Studio B and the increase of ENG system, VTR and television facilities is crucial.

2-5-3 Programme Transmission Line

The microwave link of UP&T expands from Kampala to Masaka and Mbarara in the south-west. Accordingly, programme transmission to Masaka and Mbarara stations, in which the rehabilitation is being executed by Japanese DRG and own budget, are to be relayed by the link. For the eastern part, a link is completed from Kampala to Kenya via Bugiri. From Bugiri to northwards a link is under planning to connect with Gulu up to 1988. By this completion, the direct transmission of programme to Mbale,

Soroti, Lira and Gulu will become possible. Video and audio signal quality will be greatly improved compared with those of the off-air relay system and at the same time, relay will become more stable. According to the basic plan, the link has three channels (the digital transmission system is under consideration), i.e. TV, telephone and common backup. In this system, the backup channel is switched to the damaged line, TV or telephone, thus the reliability of TV and telephone transmission will be greatly improved without breaking-down.

UP&T has also a master plan of linking major cities of the country by microwave link for relaying telephone and TV programme.

2-6 Content and Scope of the Request

The complete contents of the Ugandan side's Plan for the rehabilitation and expansion of the television broadcasting network was revealed during the course of the site survey included in the survey work. There was debate regarding the concrete content of the plan, the scale, and the order of priority and the plan appears to have been the result of quite detailed research and investigation. It can be understood that the request for grant aid has been made to the Japanese Government on the basis of the finalized master plan.

The purpose of this master plan is to expand television coverage to the whole nation and also to supplement the programmes broadcast, by upgrading the ENG, VTR tape editing equipment etc.

The master plan is to be executed in several stages in accordance with the given priorities, and the objective of the first stage (Objective of primary rehabilitation) is as follows.

To extend television broadcasting to cover 65% of the entire population instead of the present 8% which is limited in Kampala and the surrounding areas only. At the same time, the replenishment of the studio facilities of the Nakasero headquarters is to be carried out to the level of 1960's.

The Ugandan side anticipates the execution of the following work as part of the first stage.

(1) Rehabilitation work by Japanese DRG and self-fund (work is underway and due for completion in December, 1985).

(2) Rehabilitation carried out by grant aid from Japan (under investigation by the Project).

The rehabilitation of six transmitting stations including the one at Kololo necessitates complete renewal, however by Japanese DRG and self-fund it should be carried out provisionally for operation in the meantime with renewal of only inoperable facilities, and with transmission from six transmitting stations being the objective. This will enable the service of about 60% of the population. However, a considerable amount of aged facilities are included and the workable life spans of these facilities are short and insufficient in stability and performance, so they should be in principle replaced immediately.

The content of the request for grant aid is for the purpose of renewing the old facilities for which renewal cannot be performed under the rehabilitation plan by Japanese DRG and self-fund. The execution of these two rehabilitation plans will result in the renewal of all transmitting facilities at all six transmitting stations, and will also include the rehabilitation of one studio and peripheral equipment at the Nakasero Headquarters.

Upon the completion of both parts of this project, the output of the transmitting equipment at the Kololo transmitting station will be increased (from 5 kW to 10 kW) and the antennas at each of the transmitting stations will have been improved to ones having high efficiency. It is estimated that coverage for about 70% of the population will be obtained.

2-6-1 Master Plan of Television Network Rehabilitation

The basic concept of the plan is summerized in the following:

1) The following works are accomplished at the Kampala Headquarters which is the most important station as the centre of television programme production and transmission as well as the master station of the off air-relay.

   a) Rehabilitation of studio B and its peripheral equipment at Nakasero Headquarters.

   b) Full scale renewal of the Kololo Transmitting Station.

2) Rehabilitation of main local transmitting stations is planned which were in operation for television broadcast in the 1960s.

   These are Masaka, Mbarara, Mbale, Soroti, and Lira stations.

   The cities where these stations are located are the centres of individual districts with the administrative agency. When the plan is completed, the coverage will be extended to more than 65% of whole population.

3) Rehabilitation of transmitting stations in local cities is planned next to the main district cities mentioned in 2) above. These are Kabale, Masindi and Jinja stations.

4) Rehabilitation of TV studios (including ENG and editing equipment) of the local broadcasting stations to enable broadcasting local programmes. This makes possible producing local-oriented programmes using tribal language. Stations for the subject of rehabilitation are Mbarara, Mbale, Lira, Masindi, soroti, Gulu and Masaka.

5) Construction of nine local transmitting stations including Hoima, Kasese etc., to cover about 100% of population.

The master plan is outlined below according to the priority of each station. The priority has been determined after several discussions between the UTV and Japanese representatives.

(1) Rehabilitation of Transmitting station

1) Kampala Station (Renewal of transmitting facilities, tower, studio and ENG system)

2) Soroti Station (transmitting facilities and tower)

3) Lira Station (")

4) Gulu Station (transmitting facilities)

5) Masaka Station (")

6) Mbarara Station (")

7) Mbale Station (")

8) Kabale Station (")

9) Masindi Station (transmitting facilities, tower, and antenna)

10) Jinja Station (transmitting facilities)

11) Mbarara Station (air-conditioned studio, ENG system and 3/4" VTR editing equipment)

12) Mbale Station (")

13) Lira Station (")

14) Masindi Station (air-conditioned studio, and ENG system)

15) Soroti Station (")

16) Gulu Station (")

17) Masaka Station (")

18) Construction of other transmitting stations

Hoima, Kasese, Fort Portal, Moyo, Kitgum, Tororo, Bushenyi, Arua, and Moroto

(2) Common items

1) Spare parts

2) Test equipment

3) Vehicle (maintenance and programme material gathering)

(3) Training

For maintaining broadcasting facilities in good operating condition, and securing stable signal transmission and producing of high quality programmes, maintenance of the equipment are essential. This in turn requires to have highly qualified engineers, technicians and personnel engaging in programme production through proper training. In view of the current rapid progress in technologies, training of technical personnel is urgent. Such situation prompts the UTV to request assistance in participating the training course.

(4) Request for despatching of specialist in a long-term basis

It is desired to dispatch specialists in a long-term (basis around two years) for the comprehensive training about equipment maintenance, administration etc.

The history of long-term specialist dispatch to Uganda reveals that a total of five specialists were dispatched over the period from 1970 to 1976. As Uganda's revolution war flared up, the project was interrupted and stays in that condition to date.

Note: Though the above description has been written in the sequence of (1) Rehabilitation of Transmitting station, (2) Common items and

(3) Training, it has nothing to do with the priority, and these are examined and determined in parallel since individual contents differ.

2-6-2 Rehabilitation Plan by Japanese DRG and Self Fund

Currently Uganda is implementing the rehabilitation of TV network by its own fund and Japanese debt relief grant.

This project is based on the idea that existing facilities, even if functionally unstable due to aging, are used tentatively as far as they operate scarcely and those deemed unserviceable are repaired by country's own fund with Japanese DRG, to radiate TV signal from the six main transmitting stations which were in operation in the 1960s. The coverage in this case is expected to be around 60% of entire population taking into account characteristic deterioration of old facilities, decrease of transmitter output power, low antenna efficiency etc. Among those stations, Kololo alone is currently emitting TV signal.

The transmitting stations to be recovered are Kololo (Kampala), Masaka, Mbarara, Mbale, Soroti, and Lira. The content of rehabilitation is as outlined below, it varies from station to station due to the difference in the extent of aging and damage.

New facilities to be installed have no problem about reliability, stability, performance etc., while the transmitting stations to be rehabilitated together with existing aged facilities will involve serious problems in the future operation due to difficulty of repair and spare parts supply for old facilities even though signal radiation becomes possible.

Outline of Rehabilitation

1) Kololo Transmitting Station

Renewal of 10 kW transmitter, output coaxial equipment and automatic voltage regulator.

2) Masaka Transmitting Station

Renewal of all transmitting facilities (5 kW transmitter and its peripheral equipment, 150 m tower, transmitting antenna, automatic voltage regulator etc.)

3) Mbarara Transmitting Station

Renewal of all transmitting facilities except station building (5 kW transmitter and its peripheral equipment, 150 m tower, transmitting antenna, automatic voltage regulator etc.)

4) Mbale Transmitting Station

Renewal of all transmitting facilities except station building (5 kW transmitter and its peripheral equipment, 75 m tower, transmitting antenna, automatic voltage regulator etc.)

5) Soroti Transmitting Station

Off-air receiver

6) Lira Transmitting Station

Renewal of transmitting facilities except tower and antenna (5 kW transmitter and its peripheral equipment, automatic voltage regulator etc.)

2-6-3 Contents of the Request to Japan

The contents of the request to Japan for grant aid related to the rehabilitation of TV facilities are based on the master plan. Its first target is the recovery of coverage to the level of the 1960s (65% of total population), recovering of the function of studio in Kampala Station, and construction of studio in the local transmitting stations for producing and broadcasting local programmes.

For restoring the coverage of the 1960s and maintain stable broadcasting, rehabilitation of Kololo transmitting station (Kampala) currently in operation, and complete renewal of five main local transmitting stations (Masaka, Mbarara, Mbale, soroti, and Lira) are necessary.

Rehabilitation of the above six transmitting stations is currently underway by Uganda's appropriation, however, since it is far from complete renewal, a considerable number of old facilities those are unstable in operation and difficult to be repaired will remain. For this reason, the transmitting stations using such old equipment will be extremely difficult to continue a stable broadcast for a long time. Of the six stations, Masaka, Mbarara, and Mbale have no problem because transmitting facilities of those stations are completely renewed by Japanese DRG and Uganda's own fund. Remaining stations Kololo, Soroti, and Lira are to be renewed only partially and must enter into operation utilizing a considerable quantity of old equipment holding the problem that looms ahead.

The rehabilitation of transmitting stations which makes a part of the content of request to Japan for grant aid is to renew old facilities of transmitting stations of Kololo, Soroti, and Lira that cannot be serviced by Japanese DRG and Uganda's own fund.

The rehabilitation of the studio in Kampala station is made performed for increasing the number of programmes produced by its own, making the content more substantial, and extending broadcast hours corresponding to the above-mentioned network rearrangement. There are at present three studios in Kampala Station, however it is only one that can operate though in extremely poor condition. It is far from a condition that can produce a satisfactory programme. For the time being, attempt will be made to achieve the aforementioned purpose by recovering the function of one studio among remaining two studios.

The construction of local studios are performed for producing and broadcasting local programmes in tribal languages.

Since the official language is English, many programmes transmitted from Kampala are in English. Those programmes are not always understood by local people due to language barrier. Programmes that contain topics familiar with tribesmen are, they desire, to be produced in tribal languages. To realize it local studios should be constructed.

The contents of the request for grant aid based on the master plan are as follows:

1) Kololo transmitting station

Transmitting facilities, tower, antenna, STL and peripherals.

2) Soroti transmitting station

Transmitting facilities, tower, antenna etc. and peripherals.

3) Lira transmitting station

Tower and antenna

4) Studio

Kampala Headquarters, Mbarara, Mbale, Soroti, Lira, and Gulu.

During the meetings held in Uganda with UTV representatives concerning the content of the request, strong desire was expressed to include the following items in the grant aid.

1) Installation of off-air receiver at Masaka and Mbarara Station.
Though microwave links are used to transmit broadcasting programmes to these two stations, the above are required to serve as a standby equipment in case of failure.

2) Training during the period of implementation of the project
Technical ability of engineers should be enhanced through training for the maintenance/operation of the new facilities in a good working condition for a long period of time.

a) Factory training

During the period when Japanese maker is manufacturing and adjusting equipment, Uganda's engineers participate in the works for about one month.

b) Construction site training

Engineers learn the methods of setting up, installation and adjustment at each site under the guidance of Japanese supervisors.

o) Centralized training

Engineers of transmitting stations are assembled to Kampala (tentative) for a period of about one month after completion of the construction to receive a comprehensive training.

Besides, during the meeting of the explanation on the draft final report of the project held in Uganda, additional requirements were submitted to include the following items.

1) ENG system

At least six sets of ENG systems for producing local programmes in the country area.

2) Transport Vehicle

Seven are required, one each for the ENG's, one for Soroti Station.

3) SSB Communication Equipment

Four more sets of SSB are required, one each for Nakasero Headquarters, Lira, Masaka and Mbarara station.

2-7 Present Conditions and Problems of Broadcasting Facilities

2-7-1 Kampala Station (Headquarters of UTV)

(1) Location

The station is situated on the top of the eastern slope of Nakasero Hill, of which south skirt embraces the downtown of Kampala city. UTV is located in the same premises of Ministry of Information and Broadcasting, as well as Radio Uganda, long. 31° 34' 35" E, lat. 0° 19' 33" N, and 1,241 m above sea level.

(2) Present Condition of Broadcasting House

The buildings consist of studio and office complex, neighbouring with the Ministry of Information and Broadcasting.

The studio complex is one-storied house of brick-built (partly semi basement), and the total floor space is about 1,780 m^2. In the centre, there are Studio David, with floor area of 170 m^2, and Studio B, about 230 m^2, while in the south wing, the facility rooms for studios are disposed, and in the north wing, the stage scenery rooms, OB Van garage etc. The studio complex, former Nakasero Hospital, was remodelled as a broadcasting house at the inauguration of UTV in 1963. Consequently, it has something to be desired, such as the ceiling height of 4.5 m, which is very low for TV studio, and moreover the heightening is impossible due to the limit of height of the gable roof.

Although the grid pipes for hanging of lights are installed in each studio, a few lanterns are hanged only in Studio David. The roof corrugated iron plate laid upon the wooden structure, has problems on sound and heat insulation. Air conditioner and ducts are installed in the space over the ceiling, however, it is not desirable that such noise sources are on the ceiling. The steel frame truss, apart from the roof structure, bears these loads, and the grid pipes for lighting equipment are also hanged from the truss. The roof material is in rust, and rain water leaks through them.

The air-cooled air conditioner of studio complex is out of order and the renewal is necessary.

The office complex, three-storied house of brick-made, total floor space of about 1,000 m^2, is connected to the east side of north wing of the studio complex. Its third floor is the same level of studio floor, because it is located on the eastern slope. It is used for production and management section of UTV.

(3) Transportation

Approach and transportation are easy, because Kampala station is sited on the hilltop at northern centre of city. Check for entering the premises is conducted at the gate, since it is located in the same premise of Ministry of Information and Broadcasting.

(4) Studio Faoilities

1) Studio David

The floor space is about 170 m^2 (effectively 115 ^{2}, due to its irregular shape. Only this studio is actuated barely.

A part of studio wall is painted in chroma-key blue, and on the ceiling grid pipes for hanging lanterns and the wiring of lighting equipment are installed. Switched only circuits are available for lighting without dimmers. Switch board is installed on the wall of the studio. The number of lanterns, actually used, is only four or five, and it is by far below the minimum number necessary for programme production (even for a simple talk programme, seen in the educational programme, about 40 lanterns including small ones, are necessary.)

Generally for a studio of this size of 170 m^2, three or four cameras are used. However, this studio has only two, of which one is unstable, and it causes difficulties on production of sufficient contents.

The control rooms for video and audio are separated independently adjacent to the studio, and their totally superannuated facilities turn into troubles in picture and sound quality.

As an example of audio equipment, disc player is completely out of use, and only one of two tape recorders is barely available.

2) Studio B

The floor space is about 230 m^2. No facility is installed for this studio except wiring for lighting (switched only circuits are available without dimmer as same as Studio David) and grid pipes for hanging lanterns. This studio was originally designed for programme production using an OB Van. However, it is presently out of use because of the failure of the Van.

In order to improve programme production capability of UTV, it is urgent to install sufficient equipment, for video, audio and lighting, and to remodel studio B into a general TV studio.

By these remodelling, production of four to five programmes (the number differs according to the contents) are possible daily, and more improvement of programme will be expected due to longer production time. This can be said also in the production of the education programme.

(5) Master Control Room and Continuity Studio

In the master control room, video and audio signals are sent from studios, VTR, telecine, etc. are switched into one, and sent to the transmitting station according to a programme schedule. Thus, the master control room provide a nucleus function for the broadcasting station. However, the switcher, main component of the room, is of simplified type, and has many troubles due to old model, impeding the daily broadcasting. Renewal into full-scale facilities is necessary.

A continuity studio, adjacent to the master control room, has no facilities other than grid pipes for lighting under the ceiling. It is planned that this studio will be used also for news studio after accomplishment.

(6) Recording and Reproducing Equipment

Recording, reproducing and broadcasting of programmes have severe limitation with only one 3/4-inch VTR, and one telecine chain. For example, continuous reproducing of two taped programmes is impossible with a single VTR, and while recording, reproducing is not available. According to the installation plan, it is expected to provide new 3/4-inch ENG system, one more VTR for reproducing will be necessary, as the increase of cassette tapes is expected. Also, one more telecine chain will be urgently needed, because of comparatively many film programmes.

(7) Outside Broadcasting Facilities

The station has one OB Van, of which equipment are totally superannuated (made in 1968), and at present it is out of use, due to the shortage of spare parts for camera, video and audio control equipment. Though the Van had been equipped with three camera at

first, one was disassembled for preparing spare parts, and the one of existing two is out of order, while the other one is unstable, that is, all of two are out of service.

ENG system consists of a small camera, a portable 3/4-inch VTR and lighting apparatus. Among two sets, only one is in use, the other is under repairing. They are operated by two to three personnel, and their operation is frequent. In the near future, several systems will be purchased by own budget, because only one set does not meet the demand of increasing programmes. At the same time a vehicle for programme gathering is also necessary.

2-7-2 Kololo Transmitting Station in Kampala

The nominal transmitter output power is 5 kW. It serves Kampala District, and the districts such as Entebbe, Mpigi (east), Mubende, south-east), Luwero (south), Jinja and Iganga (south-west). At the same time, it is a master station of off-air relay to the local stations in the north-eastern area.

(1) Location

It is situated on the top of Kololo Hill in the northern part of the city, long. 32° 35' 29" E, lat. 0° 29' 14" N and 1,310 m above sea level, which is about 15 minutes by car from Nakasero Headquarters.

In undulating Kampala city, the station is located on a high hill, and the propagation of TV signals is favourable.

Although only TV station was built at first, after that army camps and the telecommunication facilities of Uganda P&T (Post and Telecommunication) are shore the site at present. The premises of UTV is narrow.

(2) Housing

It is a one-storied house of brick-laid. Floor space is about 117 m^2. Although stains are evident and peel-off of wall surface

and damage of wooden door are found, however the architectural structure itself has no problem.

(3) Transmitting Tower

It is a guyed tower of 150 m height, and is situated at about six metres far from the housing. One of the anchors is placed in the army premise.

In 1975, exchange of the antennas were tried from V-type 12-stack to 4-dipole antenna 4-panel, 4-stack, to improve service area, however shortage of load capacity of tower was found. At present, only one-stack, 4-panel is mounted, and a slight slant of the tower top is observed.

Reconstruction into a tower with sufficient load capacity is necessary. However, the guyed tower is not available due to the narrow site, as mentioned above. It is desirable to construct a new self-supporting square tower in the north of housing.

(4) Road

Transportation of materials and facilities has no problem because of the paved access road. A check point is near the top, and strict checking is done by the army, because army camps are existing near by UTV transmitting station. At the time of in and out of the premises, the presentation of the bearing objects and ID card are requested.

(5) Transmitter

It was made by Toshiba Corporation in 1972. The filterplexer, a part of accessaries, made by Marconi in 1963 for a black and white TV system, has been utilized by adding lower sideband subcarrier (-4.43 MHz) notch filter. The vacuum tubes and other spare parts can not be supplied, due to the old model. A 10 kW transmitter is to be installed according to the plan based on own budget with Japanese DRG. As this Kololo station is most important geographically and from the viewpoint of being a master station of the off-air relay, it will be necessary to install a standby transmitter of the same power.