REPORT

ON

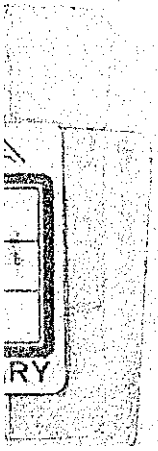
TELEVISION NETWORK PROJECT

IN UGANDA

JUNE 1968

OVERSEAS TECHNICAL COOPERATION AGENCY

TOKYO, JAPAN



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Page			Correct	Error	Correct	Error
	System		Construction Cost(Shis.)		Operation Cost (Shis.)	
31	1.	3	8,842,000	"	278,000	"
"	(1)	2	4,524,000	6,524,000		
"	(1)	3	2,652,000	3,142,000		
"	(2)	2	8,092,000	9,092,000		
"	(2)	3	5,100,000	5,984,000		
"	(3)	3	1,810,000	1,912,000		
"	(4)	2	2,916,000	3,916,000		
"	(4)	3	2,126,000	2,118,000		
"	Total	2	28,806,000	32,806,000		
"		3	20,530,000	23,130,000	824,000	844,000
34		(1)	To link existing stations			
"	Mbarara				6,000	20,000
"		(2)	To link prospective stations			
"	Kampala		310,000	1,310,000	9,000	6,000
"	Soroti		310,000	1,310,000	9,000	6,000
"	Liro		310,000	1,310,000		
"	Mbarara		310,000	1,310,000		
"	Total		8,464,000	12,464,000		
50	Powergenerator		140,000	40,000		
52	UHF Antenna		24,000	14,000		
58,59,60	Total		310,000	1,310,000		
" " "	Grand Total		310,000	1,310,000		
62	Receiving Aereal		30,000	50,000		
67	Receiver (UHF)		100,000	40,000		
"	VHF Receiver		120,000	100,000		
75	TV Transmitter		820,000	800,000		

C O N T E N T S

P R E F A C E

In the second five-year plan of Uganda, one of the major projects is the extension of the television system so as to provide a service to the viewers in all parts of the country. The Uganda Government attaches great importance to this development, particularly to enable the educational function of television to a wider audience.

Reviewing the existing television system, the Uganda Government came to a conclusion to find how it should be strengthened and expanded so as to provide wider coverage.

With this background, the Uganda Government requested the Japanese Government to despatch the technical experts to search for the means and measures to expand the present television service net work.

In response to the request, the Japanese Government despatched the these experts from Feb. 27, 1968 to Apr. 26, 1968 for the purpose of technical investigation and finding out to which extent Japan can cooperate in the future.

Published herewith is the report prepared by the three experts.
It is hoped that this report is to be made full use.

S. Shibusawa

Shinichi Shibusawa
Director General

Overseas Technical Cooperation Agency

I N T R O D U C T I O N

We were dispatched by the Government of Japan as the expects in the field of television broadcasting to carry out the pre-survey for television expansion programme in Uganda in cooperation with the Government of Uganda.

Since our arrival in Uganda at the beginning of March, 1968, we carried out the survey through discussions and exchange of opinions with the staff concerned of the Government of Uganda, gathering maps and other materials, tours of local districts for actual field survey, and so on for a month and a half. We completed the survey successfully in the middle of April.

We made further investigation, examination and study on the basis of the data obtained through the survey in Uganda after our return to Japan, and have prepared this report as a result of it.

We express our hearty thanks for the kind cooperation and assistance extended to us by Ministry of Information, Broadcasting and Tourism of Uganda which was most cooperative during the entire period of survey. We also wish to experess our deep gratitude to the staff of Ministry of Planning and Economic Development, and all who cooperated willingly with us during the period of survey in Uganda.

Toru Kamahara

Radio Regulatory Bureau,
Ministry of Posts and Telecommunications

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Japan Broadcasting Corporation (NHK)

CHAPTER I GENERAL AND SUMMARY

§ 1. Outline of Survey

During our stay in Uganda, we made tours of almost main districts such as Jinja, Tororo, Mbale, Soroti, Moroto, Lira, Gulu, Arua, Masindi, Hoima, Mubende, Fort Portal, Kasese, Kabale, Mbarara and Masaka, as well as Kampala and Entebbe, and practised various basic survey required for improvement and expansion of the television network.

First of all, we had discussions many times with the staff of Ministry of Information, Broadcasting and Tourism, Ministry of Planning and Economic Development and others, and gathered several kinds of maps, informations and materials concerned in Kampala and Entebbe. Secondly, we selected the most suitable sites for new television transmitting and relaying stations and estimated the service area anticipated in the future through making profile maps, calculating field intensity, having further discussions with the television staff of Uganda, and so on. After that we made the survey tours of the local districs in twice.

We inspected the existing television stations, namely, each station in Kampala, Mbale, Soroti, Lira, Mbarara and Masaka, and radio broadcasting stations in Kampala and Mbale also, both studios and transmitting stations. We visited Kakira, Butangola, Kagulu, Pallisa, Serere, Akisim, Ongora, Moru, Pakwach, Mabale, Nakasangole, Biko, Nkirakira, Kichwamba, Mitandi, Nakisaja, Goli, Odora and Erusi besides above mentioned main districts, in order to practise the actual field survey and to confirm whether the selected sites for new stations are proper or not, and practised actual receiving test of radio waves from the existing television stations at Jinja, Tororo, Ongora, Moru, Biko, Nkirakira, and Nakisaja.

In the intervals between the survey tours of the local districts, we began to examine the most suitable relaying system, gathered some additional materials, and had further discussions with the staff of Uganda. After finishing the survey tours, we arranged and examined the results of actual field survey and various kinds of informations and materials gathered, and drew up tentative plans of station sites, service areas, relaying systems, relaying routes and other matters concerned. Finally, the official meeting was held with the presence of Minister of Information, Broadcasting and Tourism, Permanent Secretary of Ministry of Information, Broadcasting and Tourism, and other principal exectutive staff of Ministry of Information, Broadcasting and Tourism and Ministry

of Planning and Economic Development, where we explained the outline and results of our servey and the future prospects, and discussions and exchange of opinions were done also.

§ 2. Result of Survey

1. Channel Allocation

In determining the channel allocation plan, channels of C.C.I.R. band-III allocated by ITU to Uganda has been taken into account. Consequenctly, it is desirable to arrange the nation-wide TV network channel plan as indicated in Appendix-1.

Channels for UHF relay systems to relay programs between stations may be allocated from the channels (470Mc-958Mc) allocated to UHF television.

2. Establishment of Nation-wide Network

The scope of nation-wide TV network, including the prospective plan shall be such as shown in Appendix-2.

The power of transmitters and coverage of population for each station is indicated in Appendix-3.

The specifications of television stations for prospective plan are shown in Appendix-4.

The construction and operation cost of linking stations with relay stations to improve existing off-air relay network and expanding prospective TV network, construction and operation cost of each TV station and relay station are calculated in Appendix-5 to 8, respectively.

The price for equipments quoted are those of Nippon Hoso Kyokai (NHK) now purchasing from manufactures in Japan, converted into shillings.

3. System of Relaying Program

There are three methods suitable to relay programs to adjacent stations; microwave system, UHF relay system, and combination of microwave and UHF relay system.

Among these three systems, it is preferable to adopt the "UHF relay system" as it is considered to be most economical.

4. Materialization of Nation-wide Television Network Plan

It is preferable to begin the construction work in the following order;

(1) Improvement of picture quality of existing stations
   (a) Construction of UHF relay stations
   (b) Improvement of facilities of existing stations
(2) Expansion of network
   (a) Gulu and Kabale area
   (b) Hoima, Masindi and Fort-Portal area
   (c) Arua area
   (d) Jinja, Tororo, Kasese and Moroto area

5. Management Plan and Finance

The television enterprise with expanded nation-wide networks requires many facilities, equipments and personnel as well as much expenses. Therefore, it is indispensable to establish long term management plans for construction, facilities, personnel, program, finance, organization, popularization, etc., and to manage and operate the television enterprise on the basis of these long term plans, in order to stabilize the management looking far in the future.

As principal financial resources for a big broadcasting enterprise, government subsidy, revenue from advertisement and revenue from licance fee are considerable. We think the licence fee in Uganda is too cheap as compared with in several countries, and it is quite natural to raise the licence fee to the proper amount. It is desirable to take this action as soon as possible at the early stages of television popularization, because it becomes difficult according as the popularization proceeds.

As for the advertisement revenue, the considerable amount of increase of it may be expected in the near future in proportion to the expansion of network, the popularization of TV sets, the increase of broadcast hours and the improvement of broadcast programs, considering the high rate of economic growth in Uganda. Therefore, it is desirable to decrease government subsidy by increasing other revenues and lighten the financial burden on the government, and to endeavor establishment of independent profit system of the television enterprise.

6. Organization and Personnel

There are three types of television broadcasting organization in several countries in the world, namely, governmental, public and commercial ones. What type is selected depends upon the financial resources of the television enterprise and the government policy. In Uganda, it seems proper to keep the present governmental type for

the time being, as the government subsidies occupy the greater part of the expenses of the television enterprise and these conditions are likely to continue for a considerable term. But, in the future, when it becomes possible to establish the independent profit system of the television enterprise, it may be worth of considering to study adopting a public type.

To conduct the management and operation of the television enterprise efficiently, it is necessary to establish and maintain the rational organizations,such as decision making organization, management and planning organization,and operational organization. Especially, to make the plans constructing and operating a nation-wide network, it may be required to establish a special organization in charge of this problem. It is desirable, if possible, to manage and operate both television and radio broadcasting enterprises in a single organization, so that common use of many facilities, efficient stationing of senior staff and economization of construction and operation may become possible.

Considerable number of personnel for engineering, program, management and administration shall be required in addition to the present personnel, in order to operate and maintain the nation-wide television network. These personnel, especially engineering and program personnel, shall be required to obtain highly advanced knowledge and technique, consequently it is very important to employ, train and bring up them systematically on the basis of the long term personnel plan. The excellent personnel, who will become leaders in the future, shall be sent to the broadcasting organizations in advanced countries to learn and practise for some months, and other personnel shall be trained in the training center or similar facilities with several equipments.

7. Program and Popularization

As television is the most powerful organ for mass communication, and its programs give strong influence to audience, especially young people, it is indispensable to take all means preserving and improving the quality of broadcast programs. As such means, establishment of consultative committee for program, prescription of program standard, establishment of inspection organ for program and opinion survey of viewer shall be considered.

For the development of television broadcasting enterprise, the

popularization of TV sets is indispensable. The government should endeavor to promote the popularization of TV sets by all possible means, such as expension of broadcast network, increase of broadcast hours, improvement of program, cost down of TV set, etc. In Uganda, judging from the number of household by income classes and the high rate of economic growth, further popularization to the considerable extent may be possible in the near future. Also it is desirable to establish many community viewing centers, in order to give the opportunities seeing television for the people who cannot purchase a TV set.

Further Required Survey

(1) Construction of microwave relay link

The following surveys should be undertaken to construct the microwave relay link :

(a) Confirm whether the individual paths are within sight or not.

(b) Examine the actual site where the relay stations are to be constructed.

(2) Construction of UHF relay link

An actual propagation test should be provided to the following paths, in order to confirm the calculate values:

(a) For the improvement of existing network:

Kampala ..... Butangola
Kagulu ..... Soroti
Nkirakira ..... Masaka
Nakisaja ..... Mbarara

(b) For prospective network:

Mbarara ..... Kabale
Biko ..... Hoima
Akisim ..... Moroto

(3) Others

As for other matters, such as program, personnel, finance, popularization and organization, further detailed surveys, investigations and discussions shall be required to draw up the definite and concrete plan to be practised.

CHAPTER II IMPROVEMENT AND EXPANSION OF NETWORK

§ 1. Improvement of Existing Network

The existing network consists of stations at Kampala, Mbale, Soroti, Lira and Masaka. Their transmitting power is 5 kW. Beside this, a 5 kW station at Mbarara is under construction now.

These stations are presently linked by "off-air" system as shown in Appendix -9. However the span of each adjacent station is not within line-of-sight, except for that of Mbale and Soroti. The span of each adjacent station is as following;

Kampala	Mbale	130 miles
Soroti .....Lira		70 miles
Mbale	Soroti	55 miles
Kampala	Masaka	72 miles
Masaka	Mbarara	85 miles

Therefore, the field intensity of picture signal at each station is presumed to be as;

Mbale	below	40 dBμ
Soroti		80 dBμ
Lira		50 dBμ
Masaka	below	40 dBμ
Mbarara	below	40 dBμ

Considering from these values, the field intensity of each station is not sufficient for practical use, excepting Soroti. The picture and sound qualities of these stations are capable to be improved by the following method;

1. Microwave Relay System

The best method of linking television stations for nation-wide TV network is to utilize microwave links such as performed in advanced countries. This is an excellent method to obtain high quality video and sound signals at each transmitter site. But on the other hand, the constitution of these high quality and high-security microwave link facilities may result in the requirement constructing many intermidiate relaying stations which raise the total construction cost up to an extreme order.

A microwave link plan for linking existing stations is shown in Appendix -10, and the corresponding construction and operation cost of relay stations including facilities at adjacent television

stations are shown in Appendix 5 to 8.

2. UHF Relay System

An economical method to link existing stations is to combine the "off-air" and "UHF relay system". The signal quality of this system is inferior to the microwave system but as far as the following note is carefully taken into account, they will be available for practical use.

"Each adjacent relay stations should be located within line-of-sight or should be in the range of sufficient field intensity to be received". Therefore, for stations not matching these situations, relay stations should be installed between adjacent stations in an appropiate distance.

The essential field intensity for fair reception is deemed to be about 70 dB.

The existing stations linked by this system is shown in Appendix-11., and corresponding constrction and operation cost is calculated in Appendix 5 to 8, respectively.

3. Application of the "East African Posts and Telecommunications Administration" Microwave Network

We have been imformed that E.A.P.T.A. is intending to construct a microwave circuit between Nairobi and Kampla, recently, and it is preferable to utilize this circuit to link your television stations. In connection with this, it is possible to branch a circuit from Bugiri and in the result, this saves four relaying stations to be built compared with the case of constructing an independent circuit. Further negotiations with E.A.P.T.A. shall be necessary to perform this plan. The constitution of circuit for this plan is shown in Appendix-10.

§ 2. Expansion of Network

1. Microwave Link System

The expansion of network may be accomplished by extending microwave circuits mentioned in the preceding paragraph to cities in question; Gulu, Arua, Moroto, Hoima, Masindi, Fort Portal and Kabale.

The route and relaying stations necessary for this plan are shown in Appendix-10 and the corresponding construction cost of these stations are calculated in Appendix 5 to 8.

2. UHF Relay System

This system is shown in Appendix -11 and the cost of construction and operation is calculated in Appendix 5 to 8.

3. Microwave and UHF Relay Combined System

When relaying stations are linked in series by means of UHF relay system, the signal quality of stations at the end are inferior to those of the microwave system. To avoid this kind of defect, a microwave system is applied to the important trunk lines and a UHF relaying system to external stations, thus harmonizing the technical and economical province.

This system is shown in Appendix -12 and the microwave link used from Kampala to Soroti and also to Mbarara is indicated. Stations in other areas are linked by "UHF relay" system. The construction and operation cost of these relay stations are calculated in Appendix 5 to 8.

§ 3. Construction of Sound Link

As the language used in each region differs, a multiplex sound transmission link is necessary to provide simultaneous television broadcast of different television sounds to these individual areas. It is also economical to design them so they can include lines for distributing programs to radio transmitting stations which are intended to be constructed at four places in the country.

Besides this, it is desirable to construct a separate VHF link to meet the object for teleprinting and also controlling, supervising and adjusting unattended stations.

For these objects, the following method may be applied.

1. Television Sound Link

(1) Microwave relay system

Addition of multiplexed sound channel is available. In this case the downward VHF circuit may be neglected. The block diagram of this system is shown in Appendix-13.

(2) UHF relay system

The sound channels are FM multiplexed and transmitted simultaneously with the video signal in the UHF band. This is an economical method but the characteristics of each relay station should be kept up in an excellent condition.

It is also preferable to reduce the number of channels down to such as five, in order to prevent sound channels interfering video signal and also inter cross-talk among these sound channels.

The rest of the channels are able to be multiplexed with the VHF circuit for maintenance and adjustment purpose.

The block diagram of this system is indicated in Appendix-14 and 15.

(3) Microwave and UHF relay combined system

This system is an combination of (1) and (2) described above and the block diagram is shown in Appendix 16 and 17.

2. Radio Sound Link

It is feasible to add channels to the microwave and UHF relay system as far as VHF multiplex circuit is adopted. If not, the sound signals can be sent by multiplexing them with the VHF maintenance and adjustment line. In either methods, it is necessary to add branch lines between relaying stations and radio transmitting stations.

§ 4. Improvement of Studio Facility

In order to improve the quality of television broadcast, radically, characteristics of each equipment at studio site should be maintained to a certain standard, or otherwise be reformed. These can be taken place in every case whenever any equipment has a chance to be renewed.

§ 5. Materializing of the Nation-wide Network

Whenever a network has to be improved or expanded, it is very important to decide a long term plan before undertaking the actual work. In determining the plan, it is necessary to take into account the method of transmitting programs between stations.

Therefore, it is desireable to improve firstly, the picture quality of existing stations and then start extending the network.
The most economical way to work on the network is to begin from the existing station side, step by step towards the fringe areas gradually.

Three methods have been conceived which are previously described to improve the picture quality of existing stations; they are the "microwave relay system", the "UHF relay system" and the "microwave and UHF relay combined system".

The picture quality of UHF relay system is in general somewhat inferior to the microwave system but as far as the relaying spans are short enough and number of relaying stations are not so many the reduction of picture quality can be kept within a negligible order.

The construction and operation cost of this system is cheaper and more economic than the two other systems and is deemed that this system is the best method for improving the existing network.

In the future when the television network is planned to be extended to fringe areas, the microwave relay or microwave and UHF relay combined system may be suitable. In this case, it is rather an economical way to use these circuits in common with other communication purposes.

However, considering economy, it is deemed the best to adopt the UHF relay system for expanding the network. In this case, the change-over to microwave circuit is feasible as far as the site of relaying stations and the change-over period are predetermined during the basic construction plan.

Considering the facts mentioned above, it is preferable to perform the improvement and expansion on network in the following order;

(1) Improvement of picture quality of existing network
  (a) Construction of UHF relay stations
  (b) Improvement of existing facility (including studio)
(2) Expansion of network
  (a) Gulu and Kabale area.
  (b) Hoima, Masindi and Fort Portal area
  (c) Arua area
  (d) Jinja, Tororo, Kasese and Moroto area
(3) Improvement of transmission link
  (a) Construction of 'microwave and UHF relay combined' link
  (b) Construction of nation-wide microwave relay link

CHAPTER III MANAGEMENT AND OTHERS

§ 1. Long Term Management Plan

The television broadcasting enterprise needs larger facilities, more equipments and more personnel, accordingly more expenses also, as compared with radio broadcasting enterprise. Besides it needs highly advanced knowledge and technique, in managing the enterprise, operating and maintaining facilities, and producing programs. Hence, it is indispensable for a sound development of a television broadcasting enterprise with nation-wide networks to secure adequate financial resources, skillful personnel, well equipped facilities and wide popularization of TV sets. Therefore, the several kinds of long term plans as shown below shall be made up, on the basis of the close investigations and the precise future prospects of all these conditions.

(1) Construction and facilities plan

This plan includes construction of television stations, establishment of television networks, arrangement and improvement of studio and transmitting station facilities.

(2) Program plan

This plan aims at increasing the broadcast hours and enriching and bettering the programs.

(3) Personnel plan

This concerns employment and training of necessary personnel.

(4) Financial plan

This plan embodies procurement of financial resources necessary for construction, operation and management expenses.

(5) Popularization plan

This plan includes the estimation of the future popularization of TV sets and the policy to encourage the popularization of TV sets.

(6) Organization plan

This plan aims at establishing the rational and efficient organization of the enterprise, and improving it for these purposes.

It is necessary to establish a long-term management plan on the basis of all the plans put together in order to operate the enterprise properly and stabilize the management looking far in the future.

§ 2. Finance

Usually, the financial resources for television enterprise are government subsidy, revenues from commercial broadcasts and licence fees. Other sources of revenue, that is private contributions and income from incidental business, will do in the case of a small broadcasting enterprise, but are not suitable as financial resources for a big broadcasting enterprise like this project. Therefore, we shall consider here the suitability nnd possibility of the use of the above-mentioned three sources of ravenue.

1. Government Subsidy

The television enterprise with nation-wide networks needs a great deal of expanses and thus imposes burden on the general account of the government. When viewers are restricted only to specific groups of people, even those who are not the viewers are obliged to bear the expenditure on the television enterprise. By government fund, adequate funds to meet rapid development cannot be secured. Therefore, it is desirable to endeavor to decrease government subsidy and to increase other revenues aiming at establishment of the independent profit system of the television enterprise.

2. Revenue from Licence Fee

The total amount of licence fee is the sum of the broadcasting cost and the expense of collecting fees. The amount of the licence fee is obtained by dividing the above amount by the numbers of viewers at the time. However, since the television enterprise involves a vast amount of cost, the amount of licence fee may be far beyond the limit of financial ability of the ordinary viewer when there is not a sufficient number of them. Therefore, the amount of the licence fee must be decided with due consideration for the capacity of the general public to bear the financial burden. As the licence fee is to be a factor checking more or less the popularization of TV sets, it should be in such an amount as may minimize this effect and make it possible to pay and give no feeling of resistance to pay to each household.

The typical amounts of licence fees in principal countries are given in Table 1., but they do not always give us a helpful guide. We think that the amount of licence fee in some country is to be decided politically considering the economic conditions, the present and future popularization of TV sets, etc. in its country. At the

early stages of the television enterprise, the cost of TV set will be expensive due to a limited number of TV sets. In this case, it will be necessary to seek other financial resources such as government subsidy and advertisement revenue to supplement the shortage of licence fee revenue.

Table 1. Licence Fee in Principal Countries

Country	Character	Collecter	Annual Amount of Fee
United Kingdom	Receiver licence tax	General Post Office	Radio £ 1-5-0 (25 Shs.) Radio & TV £ 5-0-0 (100 Shs.)
France	Fee for right to use of receiver	ORTF	Radio 25 Francs(36 Shs.) Radio & TV 85 Francs(124 Shs.)
Italy	Fee for reception	Ministry of Finance (Tax Agency)	Radio 2,450 Lira(28Shs.) Radio & TV 12,000 Lira(139Shs.)
Australia	Licence Fee	Postmaster-General's Department	Radio (1st service area)* £ 2-15-0 (45 Shs.) Radio (2nd service area)* £ 1-8-0 (23 Shs.) TV £ 5-0-0 (81 Shs.)
Japan	Fee for reception	Japan Broadcasting Corporation (NHK)	Radio ¥ 0 (0 Shs.) Radio & TV (black & white) ¥3,780 (76 Shs.) Radio & TV (Colour) ¥5,580 (112 Shs.)

* The first service area refers to the area within 250 miles of a station designated by ABCB, and the second service area to any area other than the first.

In Uganda, it is at the early stages of television popularization and the number of television viewers is not so many, so that the operation of television enterprise is not so much able to depend upon the revenue from licence fee. But the present licence fee

seems too cheap as compared with them of several foreign countries. The raise of licence fee to the proper amount is, in our opinions, quite natural and will give no burden and no feeling of resistance to the present viewers. It is desirable to take this action as soon as possible at the early stages of television popularization, because it becomes more and more difficult according as popularization of TV sets extends.

3. Revenue from Advertisement

When the revenue from television advertisement is added to the operating expenses, a long term plan including the method and the hours of television advertisement is desirable to be established, taking into account the total expenditure to be used for advertisement in the country, the amount of advertisement expenditure to be increased by television advertisement and the rate of advertisement to be placed into television.

In Japan the total advertisement expenditure rose at a very high growth rate as shown in Table 2. This increase may be ascribed, firstly, to be rise in the level of production. The enterprises have come to expect much from advertisement for the opening up of new markets and securing the share of sales. Secondly, the increase is due to vigorous marketing in the enterprises. Marketing is said to be made up of market research, commercialization plan, sales promotion and advertisement. This new management technique has rapidly spread, and advertisement has elevated its position in business management also. Thirdly the increase is due to the growth of the advertisement media. There has been a rapid development of broadcast medium, commercial television broadcasting, in addition to the printing medium as shown in Table 3.

These circumstances may be taken as contributing factors to the development when we consider the future trend of the advertisement expenditure in Uganda. In Uganda, the capacity of the advertising media is considered to be still at a lower level than that demanded by the enterprises, and therefore the rise of the percentage to the national income may be confidently expected (refer to Table 4.).

The share taken by each advertising medium in the total advertisement expenditure is varying from country to country, accordingly to the degree of development of each medium. Generally speaking, the share of the television medium grows rapidly according as the

expansion of network, the popularization of TV sets, the increase of broadcast hours and the improvement of broadcast programs. Therefore, the considerable amount of increasing revenue from television advertisement in the near future may be expected in Uganda.

Table 2. National Income and Advertising Expenditures (1955 - 1966)

(in 100 millions of yen)

Year	National Income	Advertising Expenditures	Percentage
1955	65,346	609	0.93
1956	73,863	745	1.01
1957	82,694	940	1.14
1958	83,591	1,065	1.27
1959	96,660	1,456	1.51
1960	115,045	1,740	1.51
1961	137,303	2,110	1.54
1962	154,145	2,435	1.58
1963	176,625	2,982	1.69
1964	203,900	3,491	1.71
1965	245,479	3,440	1.40
1966	288,300	3,794	1.33

Source: Dentsu Advertising Agency, Tokyo, Japan

§ 3. Organization

The characters of organization and types of operation of television broadcasting in various countries in the world can be divided into three major categories as follows: The first is a governmental television operated by the Government, the second is a public one by the public corporation established for the purpose, and the last is a commercial one by the private enterprises. One of these three types of telvision operation was adopted by different countries after careful study by the respective governments. In some countries, such as England and Japan, the public television is operated in parallel with commercial television

by private enterprises. In other countries, such as France, Italy, Germany, Canada, etc., only public or govenmental television provides the programs. What type of television operation is selected depends upon the financial resources of the television enterprise and the government policy.

Table 3. Mass Media Advertising Revenues (1951 - 1966)

(in 100 millions of yen)

Year	Newspaper	Magazine	Radio	TV	Others*	Total
1951	180	10	3		50	243
1952	270	18	22		75	385
1953	320	25	45	1	100	491
1954	322	30	74	4	120	550
1955	337	35	98	9	130	609
1956	405	40	130	20	150	745
1957	510	50	150	60	170	940
1958	525	55	157	105	223	1,065
1959	618	80	162	238	358	1,456
1960	684	100	178	388	390	1,740
1961	824	125	178	539	444	2,110
1962	922	144	173	690	506	2,435
1963	1,120	169	171	899	623	2,982
1964	1,297	195	170	1,081	748	3,491
1965	1,233	192	161	1,110	738	3,434
1966	1,337	211	169	1,247	830	3,794
	(34.9)**	(5.5)	(4.4)	(32.6)	(15.7)	(100.0)

* Including direct mail, outdoor advertising, export advertising, etc.

** Figures in Parenthes are percentage of each category of 1966.

Source: Dentsu Advertising Agency, Tokyo, Japan

Table 4. Top Ten Countries in Percentage of National Income Used for Advertising Expenditures

(in 100 millions of yen)

Country	Year	Advertising Expenditures	National Income	Percentage
U.S.A.	1962	44,571	1,633,320	2.73
Canada	1962	2,088	101,898	2.05
United Kingdom	1962	4,828	248,905	1.94
Australia	1962	862	46,883	1.84
Netherlands	1962	644	38,467	1.67
Switzerland	1962	541	33,312	1.61
Japan	1962	2,384	154,208	1.55
West Germany	1962	2,653	234,000	1.13
Italy	1961	815	99,911	0.82
France	1962	1,531	197,613	0.77

Source: International Advertising Association

In Uganda, the financial resources of the television enterprise are government subsidies or expenditures, licence fees and advertisement revenues. Among these resources, the government subsidies ooccupy the greater part of the expenses of the television enterprise. As these conditions are likely to continue for a fairly long time, we think it is proper to keep the present type of television operation for the time being. But, in the future, when it becomes possible to set up the independent profit system of the television enterprise by the remarkable increase of revenues from licence fee and advertisement, it will be worthy of considering to investigate adopting a public type which will be able to make the management and operation of television enterprise more efficient and rational.

In order to decide the management policy and to conduct the operation systimatically, rationally and efficiently, a broadcasting enterprise is required to establish the following structures and organizations.

1. Decision Making Organization

A decision making body shall be formed. The head of a broadcasting enterprise acts the chief of this body and the representatives of several divisions such as planning, program, engineering, finance and operation shall be the members of this body. By the establishment of this body, it becomes possible to manage the enterprise in the best way and to effect its most smooth operation from a practical and realistic standpoint.

2. Management and Planning Organization

As secretariat of the decision making body, the function of a management and planning organization is necessary. The respective divisions in a broadcasting enterprise have a close interrelationships among themselves. For example:

(1) Increase of programs would be of necesary result in increase engineering expense and personnel expense.

(2) Plans to build facilities would in principle necessitate increase of personnel.

The various divisions, particularly the functions of the program production division and the engineering division, will become highly specialized. To carry out an efficient and smooth operation of these divisions as an organized unit, a management function based on a broad outlook becomes necessary. Moreover, to make the plan constructing and operating a nation-wide television network, the establishment of special division grappling with this subject and the close cooperation between this special division and all other divisions are required. That is to say, the function of a management and planning organization shall be to cary out necessary survey and research, to make up several basic plans, and to provide accurate data which will enable the decision making organization to make a correct managerial judgement and to determine the policy with a long range vision.

3. Operational Organization

It would be necessary to establish the following divisions to carry out daily business in accordance with the basic policy on operation and management:

(1) Broadcasting division: Planning, compilation, production and examination of broadcast programs; news coverage; announcement; subsidiary function to broadcasting (use and maintenance of

studios, preparation of material and data, copyright, etc.).

(2) Engineering division: Engineering function for production of programs (including development of films); program transmission; maintenance; operation of transmitting machine.

(3) Business division: Receiver's subscription, receipt business; increasing the number of viewers; commercial and advertisement business; public relations measures toward viewers.

(4) General affairs division: Accounting (receipts disbursements and management of funds); maintenance and custody of properties; procurement of goods; personnel affairs such as employment, salaries, welfare and training; other general administrative and clerical business.

Besides, if possible, it is desirable to manage and operate both television and radio broadcasting enterprises in a single organization, because there are many common matters such as management, engineering, program production, accounting, advertisement, public relations, etc. between television and radio broadcasting enterprises, and it will make possible common use of many facilities, efficient stationing of senior staff and considerable economization of construction and operation of television and radio broadcasting.

§ 4. Personnel

To operate and maintain the nation-wide television network in Uganda, about 50 or more engineers at the least will be required in addition to the present engineers, furthermore, if the increase of broadcast hours, the improvement of broadcast programs and the revision of several systems such as licence fee system, advertisement system, etc. will be done, considerable number of personnel for program, management and administration shall be added.

It is almost impossible to employ the personnel who has adequate experience in television engineering or program production, and so it is desirable to obtain the personnel who were or are engaged in television in foreign countries, radio broadcasting, electrical industry, movie and newspaper. These newly employed personnel shall be trained and brought up systematically on the basis of the long term personnel plan.

As for the engineers, the applicants shall be the engineers of radio broadcasting and electronic industry and the graduates from engineering course of university. The excellent personnel, who will become leaders

in the future, are to be sent to the broadcasting organization and broadcast equipment manufacturing company in advanced country to learn and practise field engineering for some months.

As for the program personnel, the applicants shall be planners and producers of radio program, cameramen, artists of theater or movie, photographers and so on. The excellent personnel who will become leaders in the future, are to be sent to the broadcasting organization in advanced country to learn and practise compilation, planning and production of program for some months.

As for other personnel, it is desirable to establish a training center or similar facilities with various equipments. By this training center, it will become possible to train many personnel all together at a time through lecture and practice. Perhaps the invitation of training experts in the field of engineering and program from advanced country will be required. It is necessary to conduct training courses for the new personnel engaging in program, engineering, management and administration on the basis of employment year. It is also important to afford reorientation for the existing personnel systematically so that each employee can work to his highest efficiency and ability.

§ 5. Program

Since television is the most perfected medium for mass communication, the influence it exerts on its audience is considerable. Superior programs of good quality can play an important role in promoting social progress and in the enhancement of the livelihood of the people, whereas vulgar or unrefined programs will have a harmful effect on society. Particularly when we consider the strong influence of television programs on youth, it may well be said that the quality of programs is a decisive factor in determining the future cultural standard of a nation. Accordingly, every possible step should be taken with a view to preserving and improving the quality of programs.

Broadcast programs acquire a reason for being only when there is an audience to listen and to view them. Even when good programs are broadcast, if they are done so at the times when the perticular audience wishing such programs are unable to tune in, the hard work put in by the production staff will not be rewarded. This is where the work of program compilation comes in. Its basic objectives would consist of drawing up a time table of programs that could most easily be utilized by all types

of audiences. For this purpose it would be necessary to carry out a thorough study and analysis of the factors which effect the transmitting side, such as the types of programs, the hours and the content of programs, as well as the factors on the receiving side, such as the living time, taste and extent of the audience.

As to the compilation of programs, program production, production system, programming plan and so on, further detailed survey by a program expert would be required. As means to preserve and improve the quality of programs, the followings are recommended.

(1) Establishment of consultative committee for program

Committee shall be organized by the leading persons of the political, economic, scientific, educational, artistic and religious fields respectively, and act in a consultative capacity to the broadcasting organization on the basic matters relating to program planning, such as broadcast hours, percentage of regular broadcast hours by categories and content of programs and so on.

(2) Establishment of standard for program

The purposes of broadcasting and general standards for the contents of program shall be prescribed, in the internal regulations of the broadcasting organization, such as "program code" and "standards of broadcast programs."

(3) Establishment of inspection organ for program

In order to utilize effectively the above standards of broadcast programs it would be necessary to establish within the broadcasting organization a function for examining broadcast programs in accordance with the standards of broadcast programs.

(4) Opinion survey of viewer

In the production and compilation of broadcast programs it is important to grasp the opinions and reactions of the viewers and listeners. For this purpose it is necessary for broadcasting organization to carry out through scientific methods, opinion surveys of the television audience. A monitor system, whereby the reaction to programs can be obtained through correspondence from monitors entrusted with monitoring programs, might also be effective.

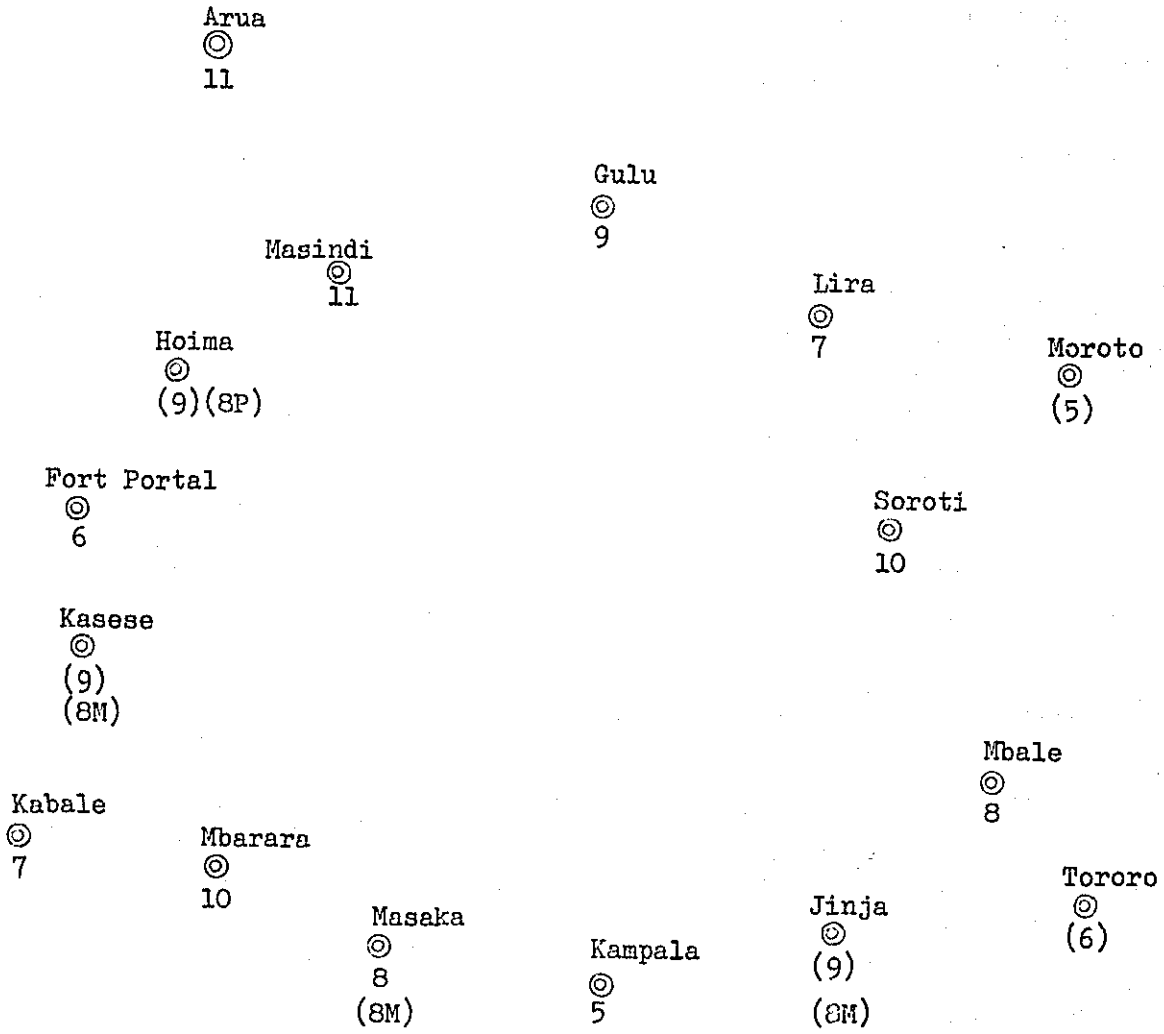
§ 6 Popularization

Prediction of future popularization of TV sets is very difficult, because the factors of popularization are too many as compared with simple

electric appliances. Generally speaking, increase of service area by expansion of network, betterment of picture quality, increase of broadcast hours, improvement of program, decrease of price of TV set and assurance of repairing service of TV set are main factors for popularization. The government should endeavor to promote the popularization of TV sets by all possible means.

The TV set being an expensive commodity, the purchasing standard of consumers should be given thorough consideration. In Japan, it is said, though without statistical ground, that the household twice of whose monthly income exceeds the price of a TV set can afford to buy one. Applying this standard to Uganda, and considering the number of household by income classes and the high rate of economic growth in Uganda, it seems that there is possibility raising the number of TV sets to about 40,000 from present 9,000, when improvement and expansion of television network will be completed, though further detailed survey shall be required to make a precise estimate of future popularization of TV set. Probably the popularization rate of TV set may be not anticipated to increase beyond above mentioned prediction, therefore, in order to give the opportunities for many people seeing television, it is desirable to establish as many community viewing centers as possible, utilizing schools, public halls and so on.

Appendix - 1. Channel Allocation



Notes:

The Channels of Hoima, Moroto, Kasese, Jinja and Tororo, were not allocated in the plan of the African VHF/UHF Broadcasting conference.

ARUA
GULU
LIRA
MOROTO
MASINDI
HOIMA
SOROTI
MBALE
TORORO
FORT PORTAL
KAMPALA
JINJA
KASESE
MASAKA
MBARARA
KABALE

APPENDIX - 2

NATION-WIDE TELEVISION NETWORK.
(ESTIMATED SERVICE AREA OF EXISTING AND PROSPECTIVE STATIONS PROTTED)

GRADE A* ——— EXISTING STATION
——— PROSPECTIVE STATION

GRADE B* - - - - EXISTING STATION
- - - - - PROSPECTIVE STATION

* SEE APPENDIX - 3 NOTE (2)

Appendix - 3. Scope of Existing and Prospective TV. Stations in Uganda

Location	Transmitter Power (kw)		Coverage of Population (in Thousands)				Remarks
	Video	Sound	Grade A	Grade B	Total	Coverage %	
Kampala	5	1	700	600	1300	20	
Soroti	"	"	400	*	400	6.2	
Mbale	"	"	1000		1000	15.4	Present
Lira	"	"	300	150	450	7.0	
Masaka	"	"	250	200	450	7.0	
Mbarara	"	"	500	200	700	10.8	Under construction
Total			3150	1150	4300	66.4	
Gulu	5	1	150	150	300	4.6	
Arua	0.5	0.1	100	150	250	3.9	
Masindi	5	1	70	150	220	3.4	
Hoima	0.5	0.1	50	50	110	1.6	
Fort-Portal	1	0.2	200	200	400	6.2	Prospective
Kasese	0.003	0.0006	10	10	20	0.3	
Kabale	0.5	0.1	100	100	200	3.0	
Moroto	0.01	0.002	10	10	20	0.3	
Jinja	0.003	0.0006	30	10	40	0.6	
Tororo	"	"	10	10	20	0.3	
Total			730	840	1570	24.2	
Grand Total			3880	1990	5870	90.6	

Note: (1) Total population of Uganda is about 6,500,000 (as of 1959 census.)
(2) Grade A: Within 55 db field intensity contour line, where viewers well receive excellent TV signal.
Grade B: " 40 db " " " fair " .
(3) * Over laped with Kampala and Lina

Appendix-4

Specifications of TV Stations for Prospective Plan

(A) Gulu Area

(1) Desirable transmitting site	Top of Mt. Moru	
(2) Radius of service area		
Grade A	48 miles	
Grade B	79 miles	
(3) Population in service area		
Grade A	150,000	
Grade B	150,000	
(4) Frequency	V 203.25MC	S 208.75MC
(5) Transmitter output power	V 5KW	S 1KW
(6) Power (E.R.P.)	V 50KW	S 10KW
(7) Antenna	12-stack superturnstile	
(8) Height of antenna	200ft.	
(9) Length of primary power line	6 miles.	

(B) Kabale Area

(1) Desirable transmitting site	Top of Mt. Kihimuro	
(2) Radius of service area		
Grade A	22 miles (max.)	
Grade B	38 miles (max.)	
(3) Population in service area		
Grade A	100,000	
Grade B	100,000	
(4) Frequency	V 189.25MC	S 194.75MC
(5) Transmitter output power	V 500W	S 100W
(6) Radiated power (E.R.P.)	V 1KW	S 200W
(7) Antenna	2-stack superturnstile	
(8) Height of antenna	100ft.	
(9) Length of primary power line	2 miles	

(C) Hoima Area

(1) Desirable transmitting site	Top of Mt. Ibamba	
(2) Radius of service area		
Grade A	24 miles (max.)	
Grade B	44 miles (max.)	

(3) Populations in service area

Grade A	50,000
Grade B	50,000

(4) Frequency — V 203.25MC (8P) S 208.75MC (8P)
(Not allocated in the plan of the African VHF/UHF Broadcasting conference)

(5) Transmitter output power — V 500W S 100W

(6) Radiated power (E.R.P.) — V 1KW S 200W

(7) Antenna — 2 stack superturnstile

(8) Height of antenna — 100ft.

(9) Length of primary power line — 1.5 miles

(D) Masindi Area

(1) Desirable transmitting site — Top of Mt. Kigulya

(2) Radius of service area

Grade A	34 miles (max.)
Grade B	56 miles (max.)

(3) Population in service area

Grade A	70,000
Grade B	150,000

(4) Frequency — V 217.25MC S 222.75MC

(5) Transmitter output power — V 5KW S 1KW

(6) Radiated power (E.R.P.) — V 20KW S 4KW

(7) Antenna — 6-stack superturnstile

(8) Height of the antenna — 100ft.

(9) Length of primary power line — 2 miles

(E) Fort Portal Area

(1) Desirable transmitting site — Kichiwamba (sea level 6,000ft)

(2) Radius of service area

Grade A	42 miles (max.)
Grade B	65 miles (max.)

(3) Population in the service area

Grade A	200,000
" B	200,000

(4) Frequency — V 182.25MC S 187.75MC

(5) Transmitting output power — V 1KW S 200W

(6) Radiated power (E.R.P.) — V 5KW S 1KW

(7) Antenna — 4-stack supergain on 3 faces of mast

(8) Height of the antenna — 100ft.

(9) Length of primary power line — 1 mile

(F) Moroto Area

(1) Desirable transmitting site — Arikotchong (sea level 4800ft)

(2) Radius of service area

Grade A — 12 miles (max.)

Grade B — 22 miles (max.)

(3) Population in the service area

Grade A — 10.000

Grade B — 10.000

(4) Frequency — V 175.25MC — S 180.75MC

(Not allocated in the plan of the African VHF/UHF Broadcasting Conference)

(5) Transmitting output power — V 10W — S 2W

(6) Radiated power (E.R.P.) — V 100W — S 20W

(7) Antenna — 3-stack supergain on one face of mast.

(8) Height of the antenna — 100ft.

(9) Length of primary power line — 2 miles

(G) Arua Area

(1) Desirable transmitting site — Moni (sea level 4000ft)

(2) Radius of service area

Grade A — 19 miles (max)

Grade B — 34 miles (max)

(3) Population in the service area

Grade A — 100,000

Grade B — 150,000

(4) Frequency — V 217.25MC — S 222.75MC

(5) Transmitting output power — V 500W — S 100W

(6) Radiated power (E.R.P.) — V 1KW — S 200W

(7) Antenna — 2 stack superturnstile

(8) Height of the antenna — 100ft.

(9) Length of primary power line — 1 mile

(H) Kasese Area

(1) Desirable transmitting site — Nyakibingo (sea level 5700ft)

(2) Radius of service area

	Grade A	9 miles (max.)
	Grade B	14 miles (max.)
(3) Population in the service area		
	Grade A	10,000
	Grade B	10,000
(4) Frequency		V 203.25MC (8M) S 208.75MC (8M)

(Not allocated in the plan of the African VHF/UHF Broadcasting Conference)

(5) Transmitting output power	V 3W	S 0.6W
(6) Radiated power (E.R.P.)	V 10W	S 2W
(7) Antenna	2-stack supergain on 2 faces of mast.	
(8) Height of the antenna	50ft.	
(9) Length of primary power line	1.5 miles	

(I) Jinja Area

(1) Desirable transmitting site	Kakira (sea level 4.400ft)	
(2) Radius of service area		
Grade A	10 miles (max.)	
Grade B	12 miles (max.)	
(3) Population in the service area		
Grade A	30,000	
Grade B	10,000	
(4) Frequency	V 203.25MC(8M)	S 208.75MC (8M)

(Not allocated in the plan of the African VHF/UHF Braddcasting Conference)

(5) Transmitting output power	V 3W	S 0.6W
(6) Radiated power (E.R.P.)	V 20W	S 4W
(7) Antenna	2-stack supergain on one face of mast.	
(8) Height of the antenna	50ft.	
(9) Length of primary power line	300ft.	

(J) Tororo Area

(1) Desirable transmitting site	Rock hill
(2) adius of service area	
Grade A	8 miles (max.)
Grade B	11 miles(max.)
(3) Population in the service area	
Grade A	10,000

	Grade B	10,000
(4) Frequency	V 182.25MC	S 187.75MC
(Not allocated in the plan of the African VHF/UHF Broadcasting Confesence		
(5) Transmitting output power	V 3W	S 0.6W
(6) Radiated power (E.R.P.)	V 10W	S 2W
(7) Antenna	3-stack superturnstile	
(8) Height of the antenna	30ft.	
(9) Length of primaty power line	0	

Appendix-5

Construction and Operation Cost (annual) of improving and expanding TV network with each Relay System

	System	Construction Cost (Shis)	Operation Cost(Shis)	Remarks
1. Improvement of existing network	1 2 3	5,908,000 9,974,000 "	248,000 298,000 "	
2. Expansion of prospective network				
(1) Gulu and Kabale area	1 2 3	2,652,000 6,524,000 3,142,000	126,000 148,000 126,000	
(2) Hoima Masindi and Fort-Portal area	1 2 3	5,100,000 9,092,000 5,984,000	258,000 274,000 258,000	
(3) Arua area	1 2 3	1,810,000 3,300,000 1,912,000	80,000 128,000 80,000	
(4) Jinia Tororo Kasese and Moroto area	1 2 3	2,126,000 3,916,000 2,118,000	82,000 92,000 82,000	
Total	1 2 3	17,596,000 32,806,000 23,130,000	794,000 940,000 844,000	

Note: 1. UHF Relay System.
2, Microwave relay system.
3. Microwave and UHF combined system

Appendix-6 Construction and Operation Cost (annual) of each TV Station (Summary)

1. Applying UHF Relay System

Station	Construction Cost (Shis)	Operation Cost (Shis)	Remarks
Gulu	1,810,000	78,000	5KW
Kabale	842,000	48,000	0.5KW
Hoima	1,200,000	48,000	0.5KW
Masindi	1,510,000	78,000	5KW
Fort Portal	1,178,000	48,000	1KW
Moroto	570,000	14,000	0.01KW
Arua	790,000	48,000	0.5KW
Kasese	290,000	12,000	0.003KW
Jinja	220,000	12,000	"
Tororo	330,000	12,000	"
Total	8,740,000	398,000	

2. Applying Microwave System

Station	Construction Cost	Operation Cost	Remarks
Gulu	2,320,000	80,000	5KW
Kabale	982,000	48,000	0.5KW
Hoima	1,772,000	50,000	0.5KW
Masindi	1,730,000	78,000	5KW
Fort Portal	1,270,000	48,000	1KW
Moroto	562,000	16,000	0.01KW
Arua	892,000	48,000	0.5KW
Kasese	290,000	12,000	0.003KW
Jinja	220.000	12,000	"
Tororo	330,000	12,000	"
Total	10,368,000	404,000	

Appendix-7 Construction and Operation Cost (annual) of each Relay Station (Summary)

1. UHF Relay System

(1) To Link Existing Stations

Station	Construction Cost (Shis)	Operation Cost (Shis)	Remarks
Kampala	946,000	28,000	UHF 0.03kw
Butangola	604,000	32,000	" 0.1kw
Kagulu	604,000	32,000	" 0.1kw
Soroti	500,000	6,000	"Receiver only
Ongora	576,000	30,000	" 0.03kw
Lira	198,000	6,000	"Receiver only
Mbale	182,000	6,000	VHF Receiver only
Serere	494,000	32,000	UHF 0.01kw due to propaga-
	576,000		tion test
Nkirakira		32,000	UHF 0.1kw
Masaka	430,000	6,000	Receiver only
Nakisaja	576,000	32,000	" 0.1kw
Mbarara	222,000	6,000	" Receiver only
Total	5,908,000	248,000	

(2) To Link Prospective Stations

Biko	636,000	32,000	UHF 0.1kw
Mabole	576,000	32,000	0.1kw
Odora	526,000	16,000	" 0.01kw
Goli	494,000	16,000	" 0.01kw
Akisim	716,000	32,000	" 0.1kw
Total	2,948,000	128,000	

2 Microwave relay system

(1) To Link Existing Stations

Kampala	1062,000	20,000	SHF 1W x 2
Soroti	792,000	20,000	"

Mbale	312,000	6,000	SHF Receiver only
Lira	312,000	6,000	" "
Mbarara	312,000	20,000	" "
Wankobe	602,000	20,000	
Butangola	"	20,000	
Kamuli	"	"	
Kagulu	"	"	
Serere	"	"	
Ongora	"	"	SHF translater 1W x 1
Tididiek	"	"	
Mbango	"	"	
Nkirakira	"	"	SHF 1W x 1
Masaka	562,000	"	
Nakisaja	602,000	"	SHF translater 1W x 1
Kishakizi	"	"	
Total	9,974,000	298,000	

(2) To Link Prospective Stations

Kampala	1,310,000	6,000	SHF 1W x 1
Soroti	1,310,000	6,000	"
Lira	1,310,000	6,000	"
Mbarara	1,310,000	6,000	"
Kisulo	602,000	20,000	"
Biko	"	"	"
Kyankuanzi	"	"	"
Mabole	"	"	"
Kagora	"	"	"
Igyrua	"	"	"
Koc	"	"	"
Odora	"	"	"
Pakwatch	"	"	"
Goli	"	"	"
Katakwi	"	"	"
Akisim	"	"	"
Total	12,464,000	270,000	

Appendix-8 Construction Cost of stations

- O UHF relay stations for improvement of the existing network.

  Kampala, Butangola, Kagulu, Serere, Soroti, Ongora, Lira, Mbale, Nkirakira Masaka, Nakisaja, and Mbarara.

- O UHF relay stations for prospective network .

  Biko, Mabale, Odora, Goli, and Akisim.

- O Microwave relay stations for improvement of the existing network.

  Kampala, Soroti, Mbale, Lira, Mbarara, Masaka, Wankobe, Butangola, Kamuli, Kagulu, Serere, Ongora, Tididiek, Mbango, Nkirakira, Nakisaja and Kishakizi,

- O Microwave relay stations for prospective network

  Kampala, Soroti, Lira, Mbarara, Kisule, Biko, Kyankwanzi, Mabale, Kagora, Igyrua, Koc, Odora, Pakwatch, Goli, Katakwi, and Akisim.

- O T.V. transmitting stations (UHF relay system).

  Gulu, Kabale, Hoima, Masindi, Fort Portal, Moroto, Arua, Kasese, Jinja and Tororo.

- O T.V. transmitting stations (microwave relay system).

  Gulu, Kabale, Hoima, Masindi, Fort Portal, Moroto, and Arua,

  (Kasese, Jinja and Tororo same as above item)

Estimated Cost of Kampala
UHF Relay Station

(0.03KW) for improvement of the existing network (Unit in Shs)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30 ft.(for Kolol)
Total		
UHF Antenna	24,000	8 ft. ϕ parabola including feeder
UHF Transmitter	360,000	Including Multi-plex Terminal Eqp. and standby units.
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	Including spare unit
" Receiver 2	40,000	"
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.		
Power Generater Eqp.	420,000	Studio 125 KVA Transmitting station 50 KVA
Measuring Instrument	10,000	
Accessory Eqp.	12,000	Tools etc.
Total	946,000	
Grand Total	946,000	

Estimated Cost of Butangola
UHF Relay Station

(0.1KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft. ϕ parabola
UHF Translater	180,000	Including spare units
Receiver( )		
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x 2 Including automatic Control Eqp.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	604,000	
Grand Total	604,000	

Estimated Cost of Kagulu
UHF Relay Station
(0.1KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft. ϕ parabola
UHF Translater	180,000	Including spare units.
Receiver ( )		
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x 2. Including automatic control Eqp.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	604,000	
Grand Total	604,000	

Estimated Cost of Serere
UHF Relay Station
(0.01KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft. ϕ parabola
UHF Translater	140,000	Including spare unit
Receiver ( )		
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	20,000	3KVA
Power Generater Eqp.	140,000	3KVA x 2. Including automatic control unit
Measuring Instrument		
Accessory Eqp.	12,000	
Total	494,000	
Grand Total	494,000	

Estimated Cost of Soroti
UHF Relay Station

( ) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	
Land	Local Purchase	
Building	"	
Tower	"	60-150 ft. due to propagation test
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver (UHF)	100,000	Including sound multiplex Eqp. and spare units.
Receiving Aereal	38,000	13 ft.ϕ parabola
VHF Transmitter 3	90,000	5W
" Receiver 3	60,000	
" Aereal 3	30,000	3 element yagi
Power Supply Eqp.		
Power Generater Eqp.	160,000	50KVA
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	500,000	
Grand Total	500,000	

Estimated Cost of Ongora

UHF Relay Station

(0.03KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft. ϕ parabola
V-U Translater	180,000	Including spare units.
Receiver ( )		
Receiving Aereal VHF	10,000	5 element yagi
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	30,000	15KVA.
Power Generater Eqp.	200,000	10KVA x 2. Including automatic control.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	576,000	
Grand Total	576,000	

Estimated cost of Lira

UHF Relay Station

( ) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver (UHF)	100,000	Including sound multiplex Eqp. and spare units.
Receiving Aereal	38,000	13ft.ϕ parabola
VHF Transmitter	30,000	5W
" Receiver	20,000	
" Aereal	10,000	3 element yagi
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.		
Total	198,000	
Grand Total	198,000	

Estimated Cost of Mbale
UHF Relay Station

( ) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver (VHF)	100,000	Including sound multiplex Eqp. and spare units.
Receiving Aereal	10,000	8 element yagi.
VHF Transmitter	30,000	5W
" Receiver	20,000	
" Aereal	10,000	3 element yagi
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	12,000	
Total	182,000	
Grand Total	182,000	

Estimated Cost of Nkirakira
UHF Relay Station

(0.1KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft.ϕ parabola
V-U Translater	180,000	Including spare units
Receiver ( )		
Receiving Aereal	10,000	8 element yagi
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10 KVA x 2.
Measuring Instrument		Including automatic control Eqp.
Accessory Eqp.	12,000	
Total	576,000	
Grand Total	576,000	

Estimated Cost of Masaka
UHF Relay Station

( ) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	120ft. due to propagation test.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver (UHF)	100,000	Including sound multiplex Eqp.
Receiving Aereal	38,000	13ft.ϕ parabola
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Generater Eqp.	160,000	50KVA
Measuring Instrument		
Accessory Eqp.	12,000	
Total	430,000	
Grand Total	430,000	

Estimated Cost of Nakisaja
UHF Relay Station

(0.1KW) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft.ϕ parabola
V-U Translater	180,000	Including spare units.
Receiver ( )		
Receiving Aereal VHF	10,000	8 element yagi
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 element yagi
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x 2. Including automatic control unit.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	576,000	
Grand Total	576,000	

Estimated Cost of Mbarara
UHF Relay Station

( ) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft. height
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver (UHF)	100,000	Including sound multiplex Eqp.
Receiving Aereal	40,000	13ft.ϕ parabola
VHF Transmitter	30,000	5W
" Receiver	20,000	
" Aereal	10,000	3 element yagi
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	222,000	
Grand Total	222,000	

Estimated Cost of Biko
UHF Relay Station
(0.1KW) for prospective network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft. height
Total		
UHF Antenna	24,000	8ft. ϕ parabola
V-U Translater	180,000	Including spare units
Receiver ( )		
Receiving Aereal	10,000	8 element yagi VHF
VHF Transmitter 3	90,000	One for use at Kampala station
" Receiver 3	60,000	
" Aereal 3	30,000	
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x 2 Including automatic control unit
Measuring Instrument		
Accessory Eqp.	12,000	
Total	636,000	
Grand Total	636,000	

Estimated Cost of Mabale
UHF Relay Station
(0.1KW) for prospective network (Unit in Shs.)

Classification	Cost in Shs	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft. height
Total		
UHF Antenna	24,000	8ft.ϕ parabola
V-U Translater	180,000	Including spare units
Receiver ( )		
Receiving Aereal	10,000	8 element yagi VHF
VHF Transmitter 2	60,000	
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x2. Including automatic control unit
Measuring Instrument		
Accessory Eqp.	12,000	
Total	576,000	
Grand Total	576,000	

Estimated Cost of Odora
UHF Relay Station
for prospective network

(0.01KW) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	24,000	8ft parabola
V-U Translater	140,000	Including spare units
Receiver ( )		
Receiving Aereal	10,000	8 element yagi VHF
VHF Transmitter 3	90,000	Including one for use Gulu station
" Receiver 3	60,000	"
" Aereal 3	30,000	"
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	20,000	3KVA
Power Generater Eqp.	40,000	3KVA x 2 Including automatic control unit.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	526,000	
Grand Total	526,000	

Estimated Cost of Goli
UHF Relay Station
(0.01KW) for prospective network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower		30ft.
Total		
UHF Antenna	24,000	8ft.ϕ parabola
U-U Translater	140,000	Including spare units
Receiver ( )		
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	20,000	3KVA
Power Generater Eqp.	140,000	3KVA x 2 Including automatic control unit.
Measuring Instrument		
Acdessory Eqp.	12,000	
Total	494,000	
Grand Total	494,000	

(0.1KW)

Estimated Cost of Akisim
UHF Relay Station
for prospective network

(Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
UHF Antenna	14,000	8ft. parabola
V-U Translater	180,000	Including spare units
Receiver ( )		
Receiving Aereal	10,000	8 element yagi VHF
VHF Transmitter 3	170,000	5W. Including cost of terminal equipment at Kampala station and one for use at Soroti station
" Receiver 3	60,000	
" Aereal 3	30,000	
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	30,000	15KVA
Power Generater Eqp.	200,000	10KVA x 2 Including automatic control unit.
Measuring Instrument		
Accessory Eqp.	12,000	
Total	716,000	
Grand Total	716,000	

Estimated Cost of Kampala
Microwave Relay Station
(1W) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	60ft.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter 2	400,000	4GC or 6GC
" Receiver		
" Transmitting Aereal 2	100,000	10ft. ø parabola including wave guide
" Receiving Aereal		
Power Supply Eqp.		15KVA
Power Generater Eqp. 2	420,000	Studio 125KVA Transmitting station 50KVA
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	1,062,000	
Grand Total	1,062,000	

(1W)

Estimated Cost of Soroti
Microwave Station
for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	60 to 150 ft. due to Propagation Test
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter 3	90,000	5W
" Receiver 3	60,000	
" Aereal 3	30,000	3 element yagi
SHF Transmitter 2	260,000	4GC or 6GC, Including spare unit
" Receiver	120,000	
" Transmitting Aereal 2	100,000	10ft. ϕ parabola including wave guide
" Receiving Aereal	50,000	"
Power Supply Eqp.		
Power Generater Eqp.	60,000	3KVA for microwave station only
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	792,000	
Grand Total	792,000	

( )

Estimated Cost of Mbale, Lira,
Mbarara Microwave Station
for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter	30,000	
" Receiver	20,000	
" Aereal	10,000	
SHF Transmitter		
" Receiver	120,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	50,000	10ft. ϕ parabola
Power Supply Eqp.		
Power Generater Eqp.	60,000	3KVA
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	312,000	
Grand Total	312,000	

(1 W)

Estimated Cost of Masaka
Microwave Relay Station
for Improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter	140,000	for 4GC or 6GC
" Receiver	120,000	Including spare units
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal	50,000	
Power Supply Eqp.		
Power Generater Eqp.	60,000	3KVA
Measuring Instrument	10,000	
Accessory Eqp.	12,000	
Total	562,000	
Grand Total	562,000	

Estimated Cost of Wankobe, Butangola, Kanuli, Kagulu, Serere, Ongora, Tididick, Mbango, Nkirakira, Nakisaja and Kishakizo (11 stations)

Microwave Relay stations

(1 W) for improvement of the existing network (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft. (150ft. Kamuli) height in
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Translater	200,000	for 4GC or 6GC Including spare units
" Receiver		
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal	50,000	"
Power Supply Eqp.	20,000	3KVA
Power Generater Eqp.	140,000	3KVA x 2 Including
Measuring Instrument	10,000	Automatic control units
Accessory Eqp.	12,000	
Total	602,000	
Grand Total	602,000	

(1W)

Estimated Cost of Kampala
Microwave Relay Station
for prospective network

(Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter	30,000	
" Receiver	20,000	
" Aereal	10,000	
SHF Transmitter	200,000	4GC or 6GC
" Receiver		
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal		
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.		
Total	1,310,000	
Grand Total	1,310,000	

Estimated Cost of Soroti
Microwave Relay Station
(1W) for prospective network *(Unit in Shs.)*

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter	30,000	
" Receiver	20,000	
" Aereal	10,000	
SHF Transmitter	200,000	4GC or 6GC
" Receiver		
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal		
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.		
Total	1,310,000	
Grand Total	1,310,000	

Estimated Cost of Lira and
Mbarara Microwave Relay Station
for prospective network

(1W)

(Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter	30,000	
" Receiver	20,000	
" Aereal	10,000	
SHF Transmitter	200,000	4GC or 6GC
" Receiver		
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal		
Power Supply Eqp.		
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.		
Total	1,310,000	
Grand Total	1,310,000	

Estimated Cost of Kisule, Biko, Kyankwanzi, Mabale, Kagora, Igyrua, KOC, Odora, Pakwatch, Goli, Katakwi and Akishim (12 stations)
Microwave Relay Stations for prospective network.

(1W) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
T.V. Antenna		
T.V. Transmitter (Translater)		
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	5W
" Receiver 2	40,000	
" Aereal 2	20,000	3 or 5 element yagi
SHF Translater	200,000	4GC or 6GC
" Receiver		
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal	50,000	
Power Supply Eqp.	20,000	3KVA
Power Generater Eqp.	140,000	3KVA x 2 Including
Measuring Instrument	10,000	Automatic control.
Accessory Eqp.	12,000	Units.
Total	602,000	
Grand Total	602,000	

Estimated Cost of Gulu
T.V. Transmitting Station
(5KW) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	200ft.
Total		
T.V. Antenna	300,000	12 stack superturn-stile
T.V. Transmitter (Translater)	800,000	Including standby units
Receiver (VHF)	50,000	" "
Receiving Aereal		
VHF Transmitter 2	60,000	Including one for use at Lina station
" Receiver 2	40,000	
" Aereal 2	20,000	
Power Supply Eqp.	200,000	
Power Generater Eqp.	160,000	50KVA
Measuring Instrument	180,000	for VHF
Accessory Eqp.	20,000	
Total	1,810,000	
Grand Total	1,810,000	

Estimated Cost of Kabale
T.V. Transmitting Station
(500W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	100,000	2 stack superturn-stile
T.V. Transmitter (Translater)	440,000	Including standby units
Receiver (VHF)	20,000	
Receiving Aereal	10,000	
VHF Transmitter 2	60,000	Including one for use at Mbarara station
" Receiver 2	40,000	
" Aereal 2	20,000	
Power Supply Eqp.	40,000	
Power Generater Eqp.	100,000	15KVA
Measuring Instrument		
Accessory Eqp.	12,000	
Total	842,000	
Grand Total	842,000	

Estimated Cost of Hoima
T.V. Transmitting Station
(500W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	100,000	2 stacks superturn-stile
T.V. Transmitter (Translater)	440,000	Including standby units
Receiver (UHF)	100,000	" "
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 3	90,000	
" Receiver 3	60,000	
" Aereal 3	30,000	
Power Supply Eqp.	40,000	
Power Generater Eqp.	100,000	15KVA
Measuring Instrument	190,000	for VHF and UHF
Accessory Eqp.	12,000	
Total	1,200,000	
Grand Total	1,200,000	

Estimated Cost of Masindi
T.V. Transmitting Station
(5KW) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	240,000	6 stack superturn-stile
T.V. Translater	820,000	Including standby units
Receiver ( )		
Receiving Aereal	10,000	
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
Power Supply Eqp.	200,000	
Power Generater Eqp.	160,000	50KVA
Measuring Instrument		
Accessory Eqp.	20,000	
Total	1,510,000	
Grand Total	1,510,000	

Estimated Cost of Fort Portal
T.V. Transmitting Station
(1KW) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	200,000	4 stack supergain on 3 faces of mast
T.V. Transmitter (Translater)	600,000	Including standby units
Receiver (UHF)	100,000	" "
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
Power Supply Eqp.	60,000	
Power Generater Eqp.	100,000	20KVA
Measuring Instrument		
Accessory Eqp.	20,000	
Total	1,178,000	
Grand Total	1,178,000	

Estimated Cost of Moroto
T.V. Transmitting Station
(10W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	60,000	3 stack supergain on one face of mast
T.V. Transmitter (Translater)	180,000	Including standby units
Receiver (UHF)	40,000	" "
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 1	30,000	
" Receiver 1	100,000	Including terminal equipment
" Aereal 1	10,000	
Power Supply Eqp.	20,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	12,000	
Total	570,000	
Grand Total	570,000	

Estimated Cost of Arua
T.V. Transmitting Station
(500W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	100,000	2 stack superturn-stile
T.V. Transmitter (Translater)	440,000	Including standby units
Receiver (UHF)	100,000	" "
Receiving Aereal	38,000	13ft. ϕ parabola
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
Power Supply Eqp.	40,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	12,000	
Total	790,000	
Grand Total	790,000	

Estimated Cost of Kasese
T.V. Transmitting Station
(3W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	50ft.
Total		
T.V. Antenna	60,000	2 stack supergain on 2 faces of mast
T.V. Translater	80,000	
Receiver ( )		
Receiving Aereal	10,000	
VHF Transmitter 2	60,000	Including one for use at Fort Portal station
" Receiver 2	40,000	
" Aereal 2	20,000	
Power Supply Eqp.	10,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	10,000	
Total	290,000	
Grand Total	290,000	

Estimated Cost of Jinja
T.V. Transmitting Station
(3W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	50ft.
Total		
T.V. Antenna	50,000	2 stack supergain on one face of mast
T.V. Translater	80,000	
Receiver ( )		
Receiving Aereal	10,000	
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	10,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	10,000	
Total	220,000	
Grand Total	220,000	

Estimated Cost of Tororo
T.V. Transmitting Station
(3W) (UHF Relay System) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	30ft.
Total		
T.V. Antenna	100,000	3 stack superturn-stile
T.V. Translater	80,000	
Receiver ( )		
Receiving Aereal	10,000	
VHF Transmitter 2	60,000	
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter	-	
" Receiver		
" Transmitting Aereal		
" Receiving Aereal		
Power Supply Eqp.	10,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	10,000	
Total	330,000	
Grand Total	330,000	

Estimated Cost of Gulu
T.V. Transmitting Station.
(5KW) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	200ft.
Total		
T.V. Antenna	300,000	12 stack superturn-stile
T.V. Transmitter	800,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 2	60,000	Including one for Koc station
" Receiver 2	40,000	
" Aereal 2	20,000	
SHF Transmitter	260,000	1W 4GC or 6GC
" Receiver	180,000	
" Transmitting Aereal	50,000	10ft. ϕ parabola
" Receiving Aereal	50,000	"
Power Supply Eqp.	200,000	
Power Generater Eqp.	160,000	50KVA
Measuring Instrument	180,000	for VHF
Accessory Eqp.	20,000	
Total	2,320,000	
Grand Total	2,320,000	

Estimated Cost of Kabale
T.V. Transmitting Station

(500W) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna	100,000	2 stack superturnstile
T.V. Transmitter	440,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver	180,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	50,000	10ft. ϕ parabola
Power Supply Eqp.	40,000	
Power Generater Eqp.	100,000	15KVA
Measuring Instrument		
Accessory Eqp.	12,000	
Total	982,000	
Grand Total	982,000	

Estimated Cost of Hoima
T.V. Transmitting Station
(500W) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	100,000	2 stacks superturn-stile
T.V. Transmitter	440,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 3	90,000	
" Receiver 3	60,000	
" Aereal 3	30,000	
SHF Transmitter 2	360,000	1W. 4GC or 6GC
" Receiver 1	200,000	
" Transmitting Aereal 2	100,000	10ft. ϕ parabola
" Receiving Aereal 1	50,000	"
Power Supply Eqp.	40,000	
Power Generater Eqp.	100,000	15KVA
Measuring INstrument	190,000	for VHF and UHF
Accessory Eqp.	12,000	
Total	1,772,000	
Grand Total	1,772,000	

Estimated Cost of Masindi
T.V. Transmitting Station
(5KW) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	240,000	6 stack superturnstile
T.V. Transmitter	800,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver	180,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	50,000	10ft. ϕ parabola
Power Supply Eqp.	200,000	
Power Generater Eqp.	160,000	50KVA
Measuring Instrument		
Accessory Eqp.	20,000	
Total	1,730,000	
Grand Total	1,730,000	

Estimated Cost of Fort Portal
T.V. Transmitting Station
(1KW) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs..	Remarks
Land	Local Purchase	
Building	"	
Tower	"	
Total		
T.V. Antenna	200,000	4 stack supergain on 3 faces of mast.
T.V. Transmitter (Translater)	600,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver	180,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	50,000	10ft. ϕ parabola
Power Supply Eqp.	60,000	
Power Generater Eqp.	100,000	20KVA
Measuring Instrument		
Accessory Eqp.	20,000	
Total	1,270,000	
Grand Total	1,270,000	

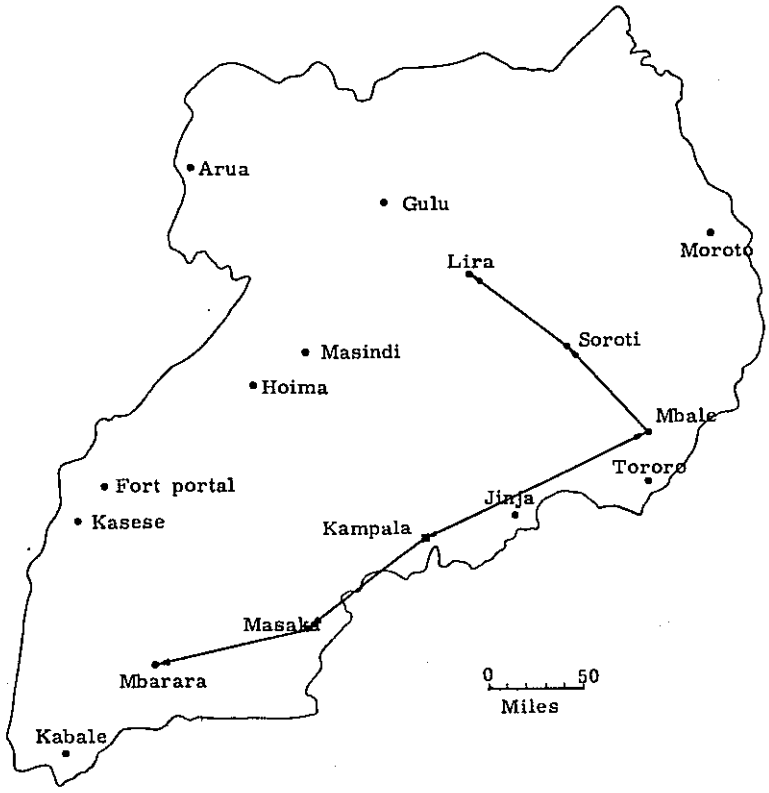
Estimated Cost of Moroto
T.V. Transmitting Station

(10W) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	60,000	3 stack supergain on one face of mast
T.V. Transmitter (Translater)	180,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver	180,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	50,000	10ft. ϕ parabola
Power Supply Eqp.	20,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	12,000	
Total	562,000	
Grand Total	562,000	

Estimated Cost of Arua
T.V. Transmitting Station
(500W) (microwave relay system) (Unit in Shs.)

Classification	Cost in Shs.	Remarks
Land	Local Purchase	
Building	"	
Tower	"	100ft.
Total		
T.V. Antenna	100,000	2 stack superturnstile
T.V. Transmitter (Translater)	440,000	Including standby units
Receiver ( )		
Receiving Aereal		
VHF Transmitter 1	30,000	
" Receiver 1	20,000	
" Aereal 1	10,000	
SHF Transmitter		
" Receiver	180,000	4GC or 6GC
" Transmitting Aereal		
" Receiving Aereal	60,000	13ft. ϕ parabola
Power Supply Eqp.	40,000	
Power Generater Eqp.		
Measuring Instrument		
Accessory Eqp.	12,000	
Total	892,000	
Grand Total	892,000	

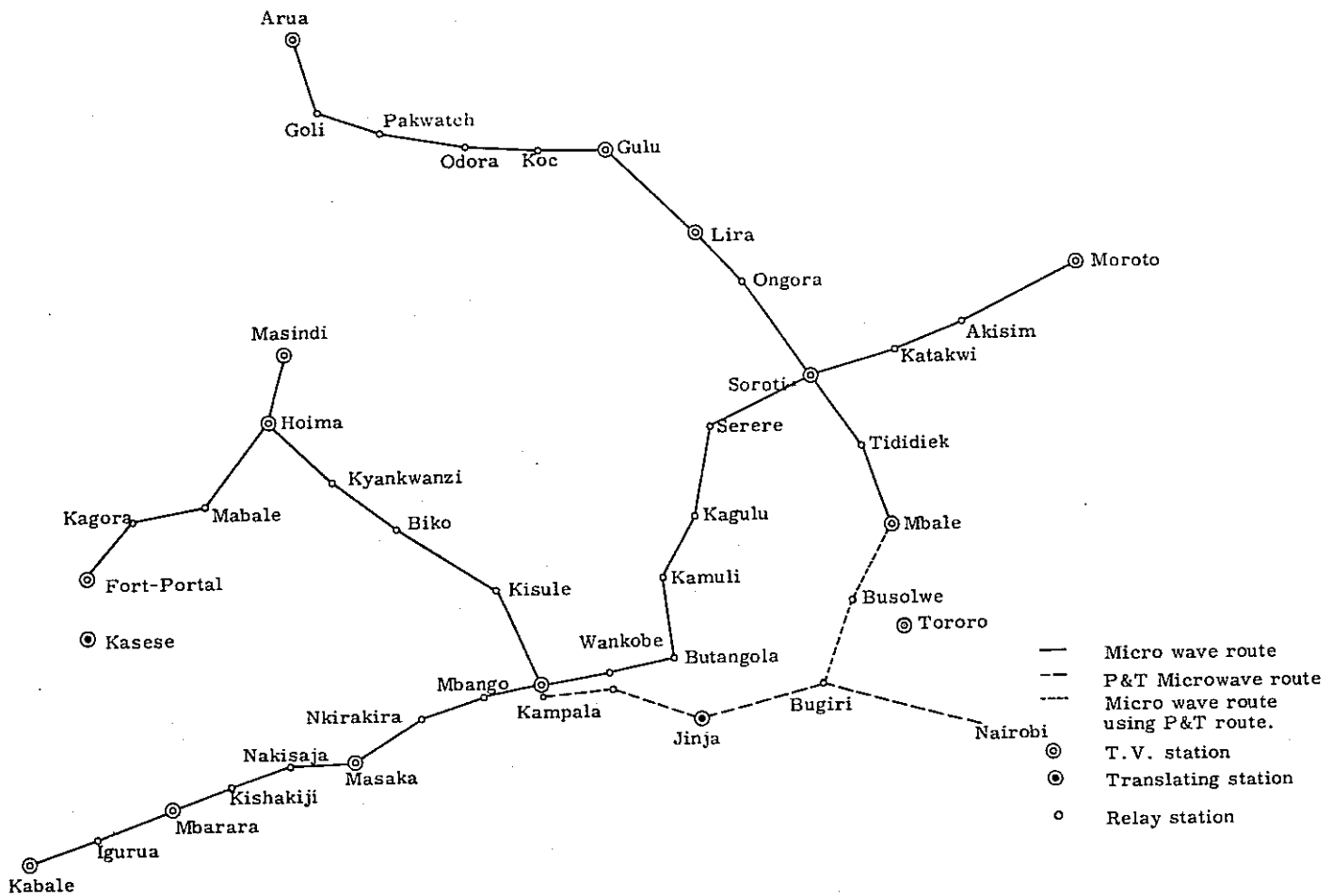


Appendix - 9.

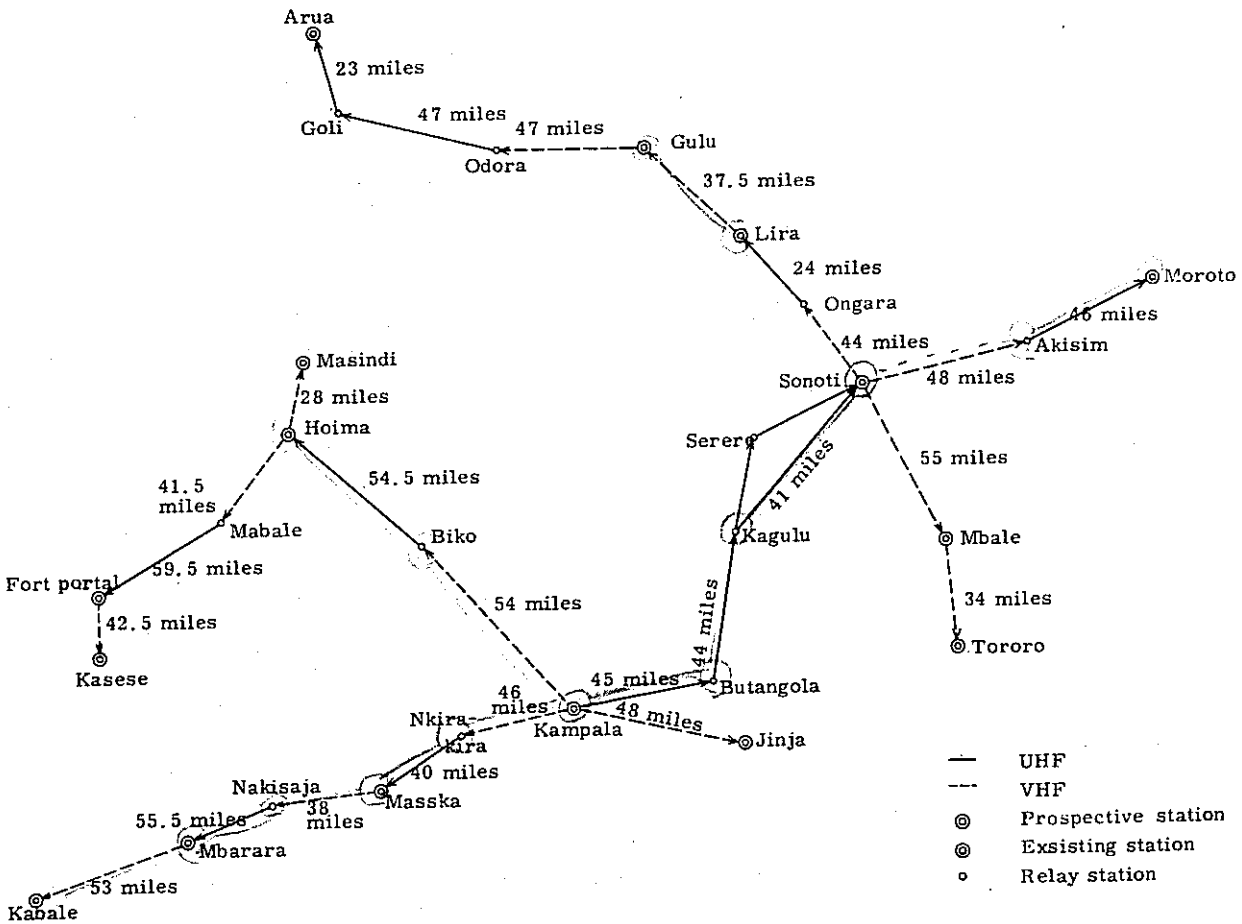
Existing Stations Linked with "off-air" relay system.

Appendix - 10

Expansion of network linked with microwave system.

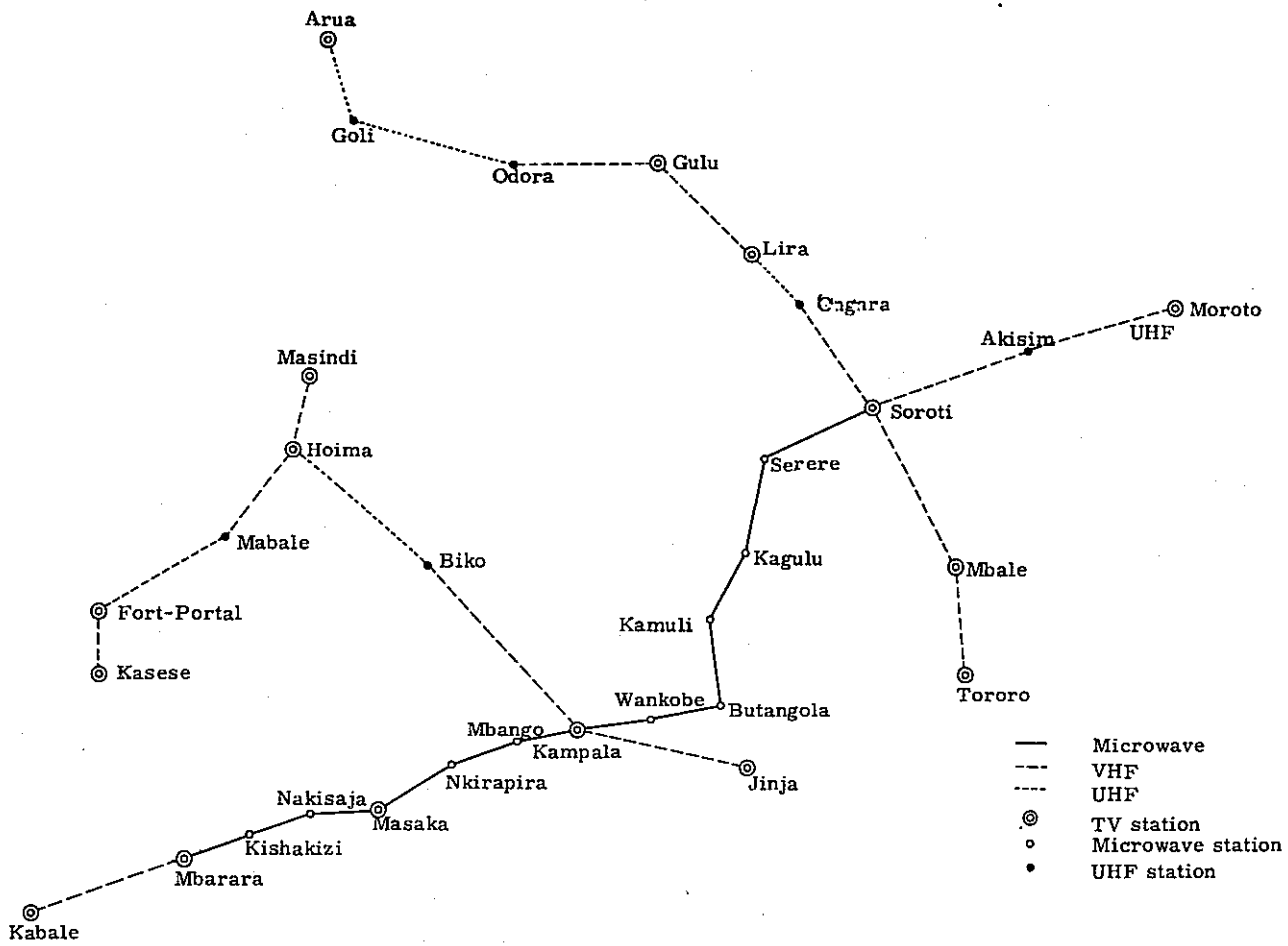


Appendix - 11 Expansion of network Linked with UHF relay system.



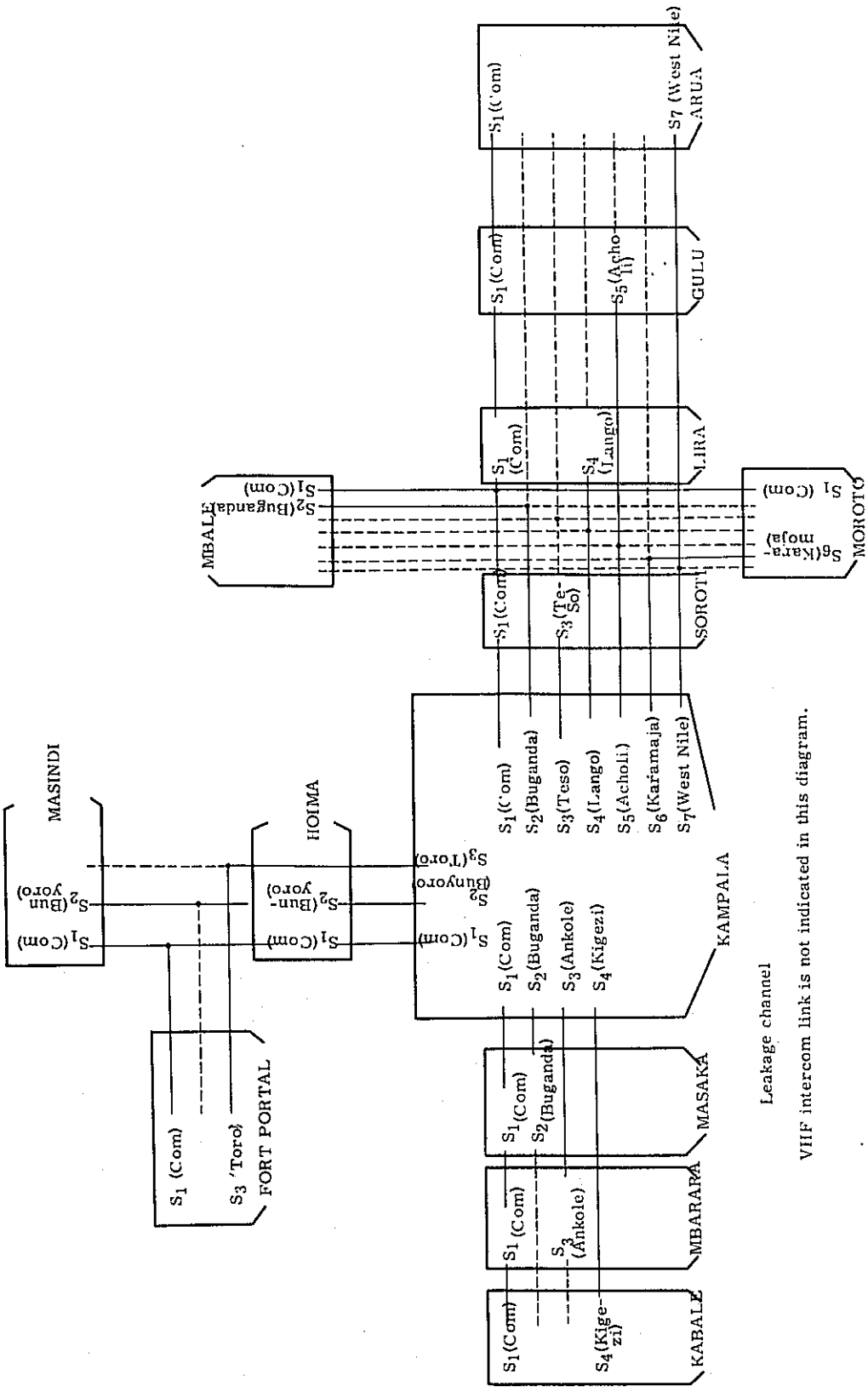
Appendix - 12

Expansion of network linked with microwave and UHF. Relay combired system.



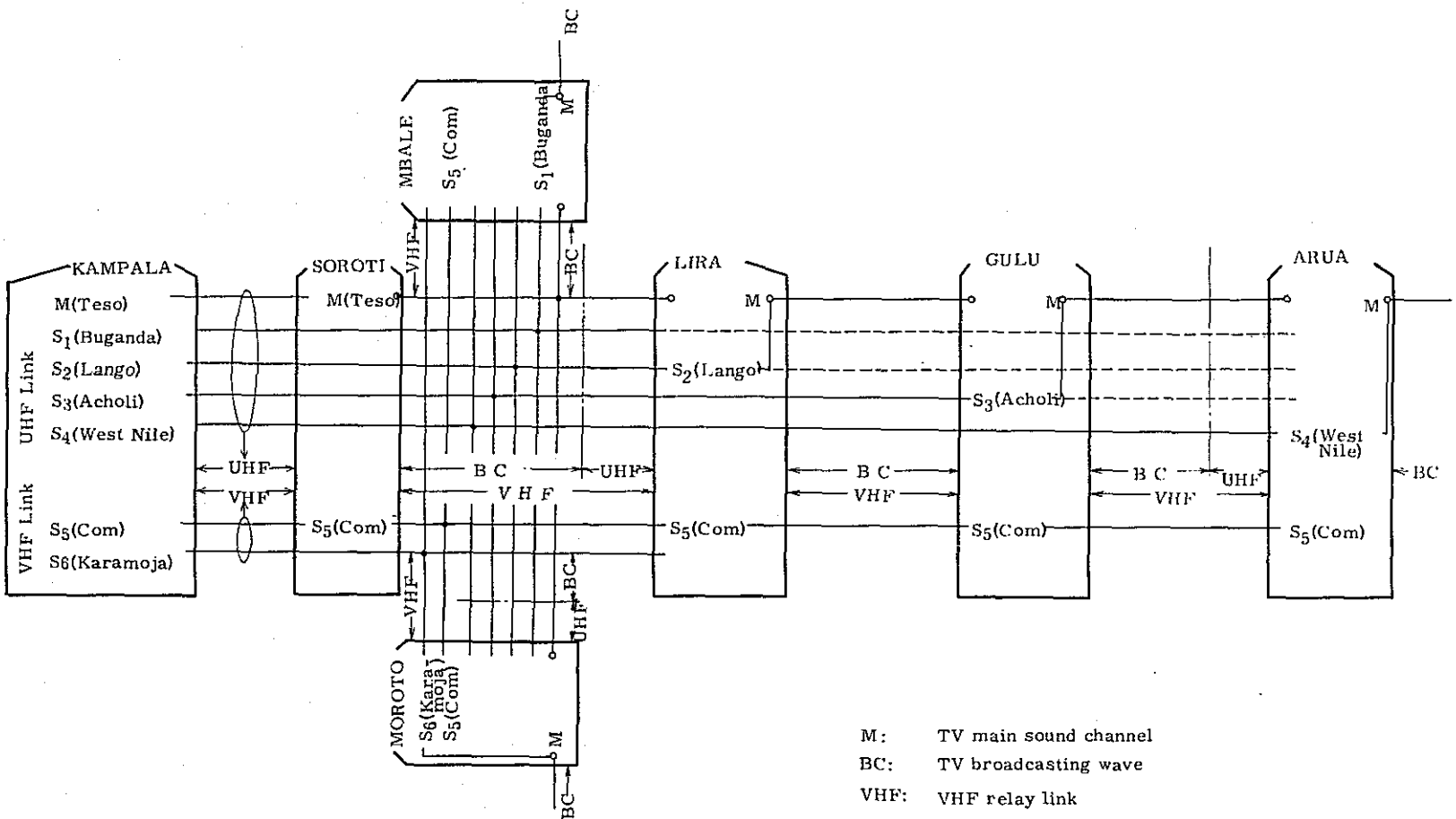
Appendix - 13

Diagram of sound-channel for Microwave relay system.



Appendix - 14

Diagram of sound channels for UHF relay system (Eastern Region)



M: TV main sound channel

BC: TV broadcasting wave

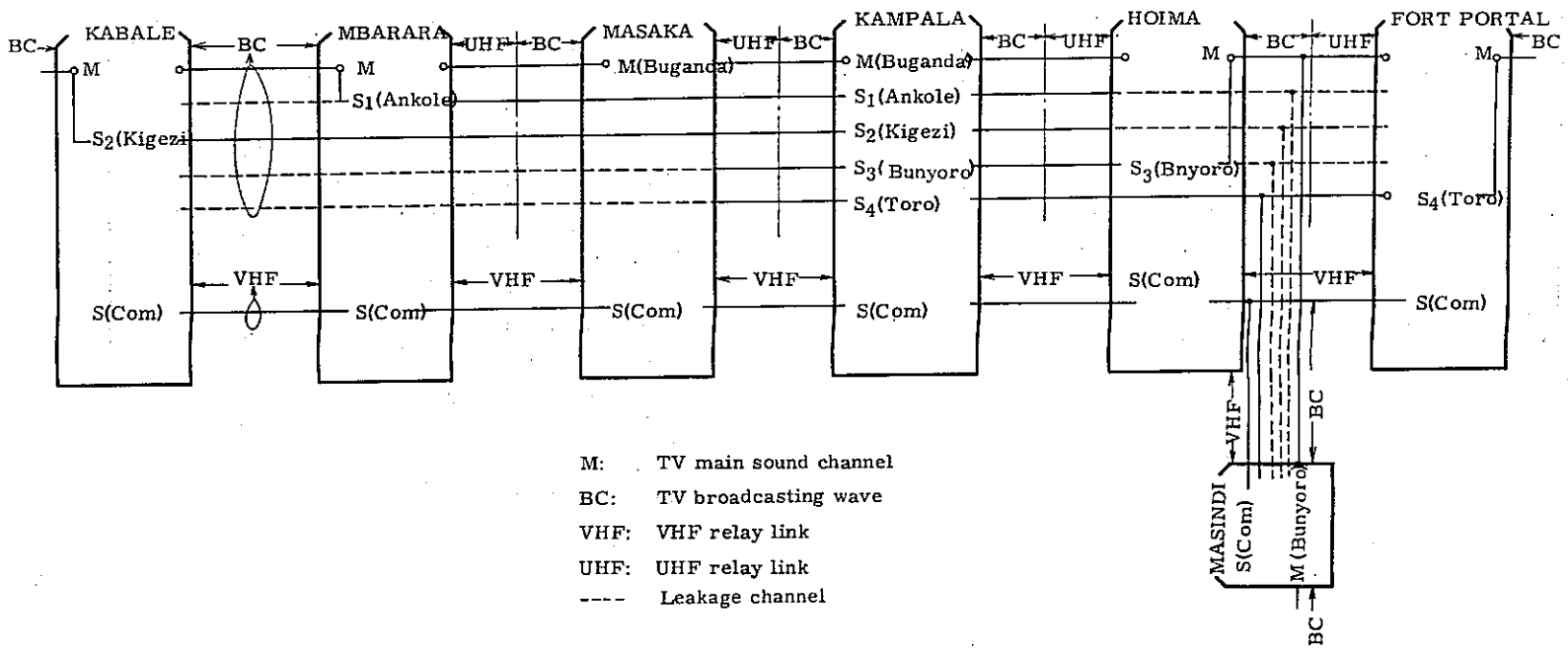
VHF: VHF relay link

UHF: UHF relay link

---- Leakage channel

Appendix -15

Diagram of sound channels for UHF relay system (Western Region)



M: TV main sound channel

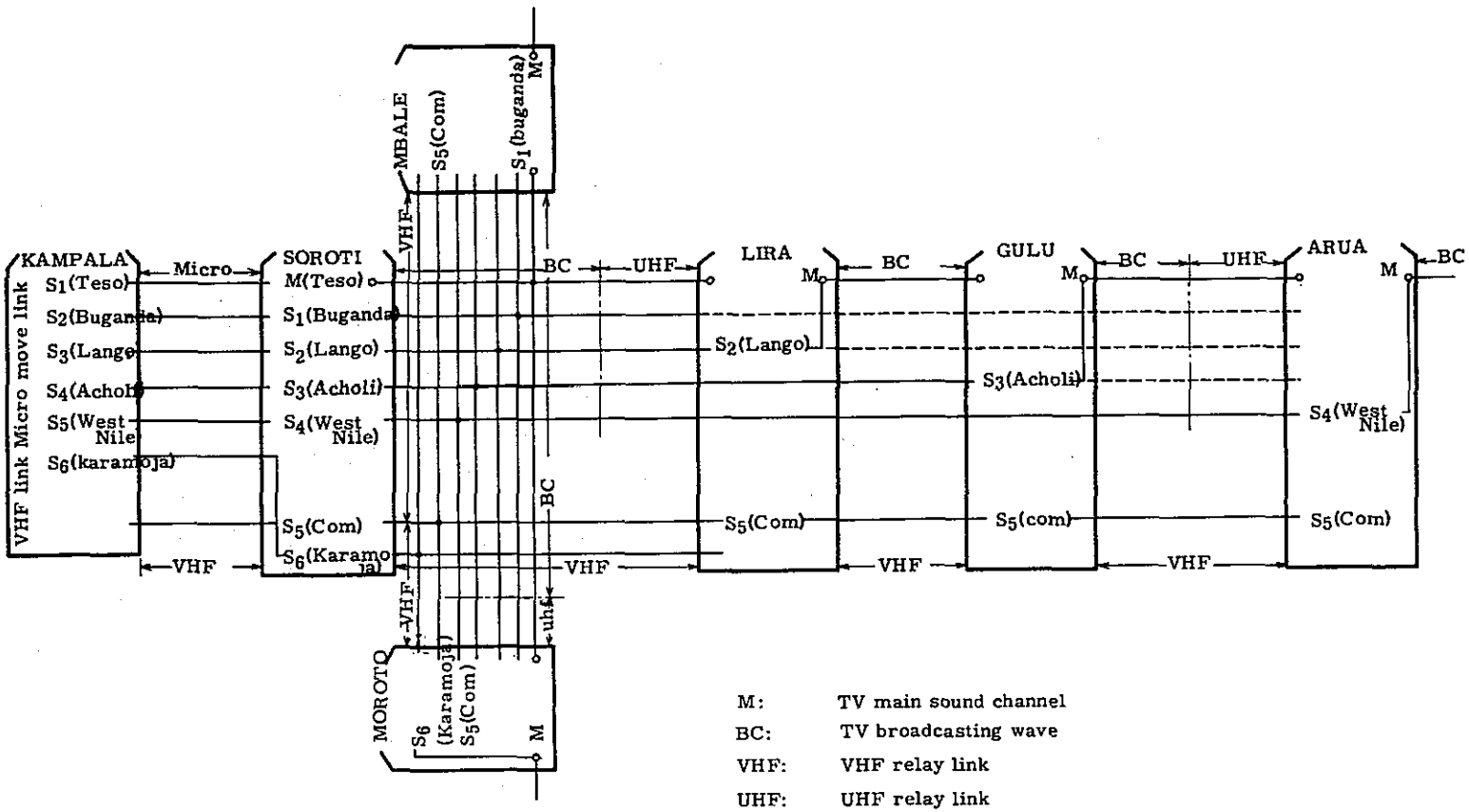
BC: TV broadcasting wave

VHF: VHF relay link

UHF: UHF relay link

---- Leakage channel

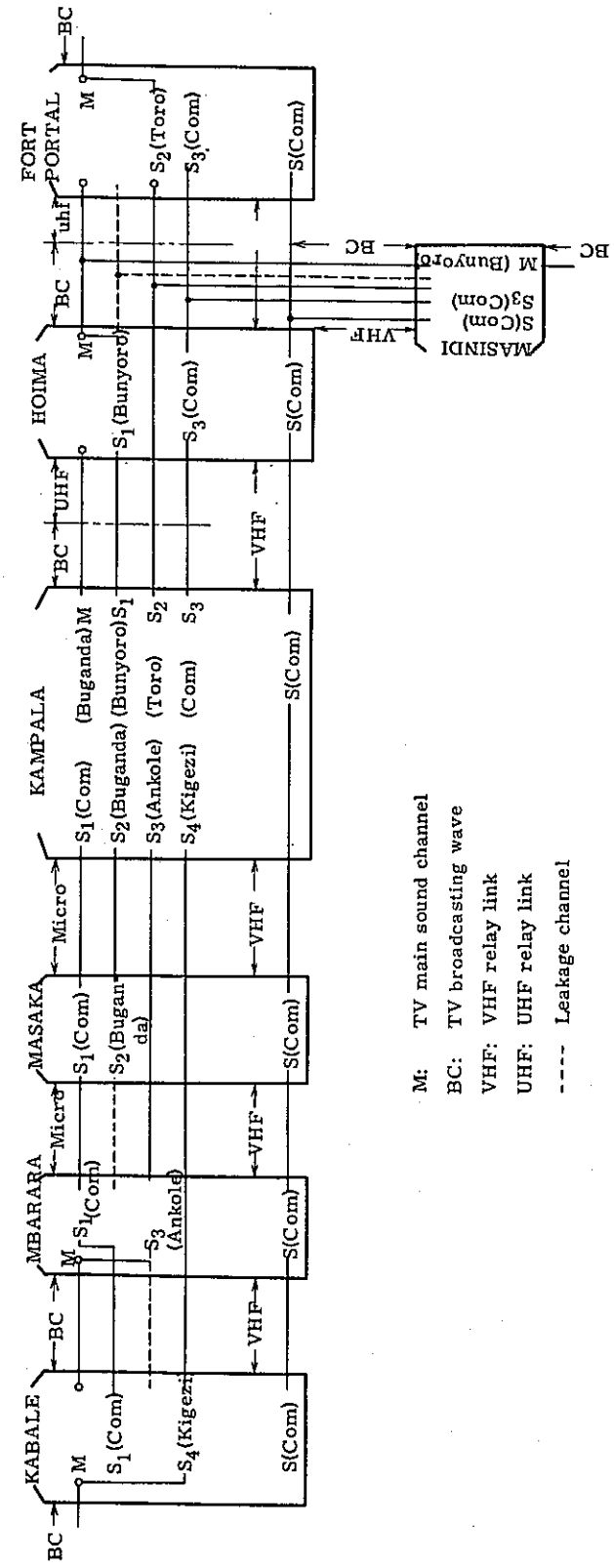
Appendix -16 Diagram of sound channels for microwave and UHF relay combined system (eastern region)



Appendix - 17

Diagram of sound channels for microwave and UHF relay combined system

(Western region)



M: TV main sound channel

BC: TV broadcasting wave

VHF: VHF relay link

UHF: UHF relay link

---- Leakage channel