No. 1

THE BASIC DESIGN STUDY REPORT ON THE REHABILITATION PROJECT FOR THE ZBC TV TRANSMITTER SYSTEM IN THE REPUBLIC OF ZIMBABWE

MARCH,1990

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of the Republic of Zimbabwe, the Government of Japan has decided to conduct a Basic Design Study on the Rehabilitation Project for the ZBC TV Transmitter System in the Republic of Zimbabwe and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Zimbabwe a survey team headed by Mr. Junichi Aoki, Special Advisor for International Cooperation, Communications Policy Bureau, the Ministry of Posts and Telecommunications, from November 14 to December 10 , 1989.

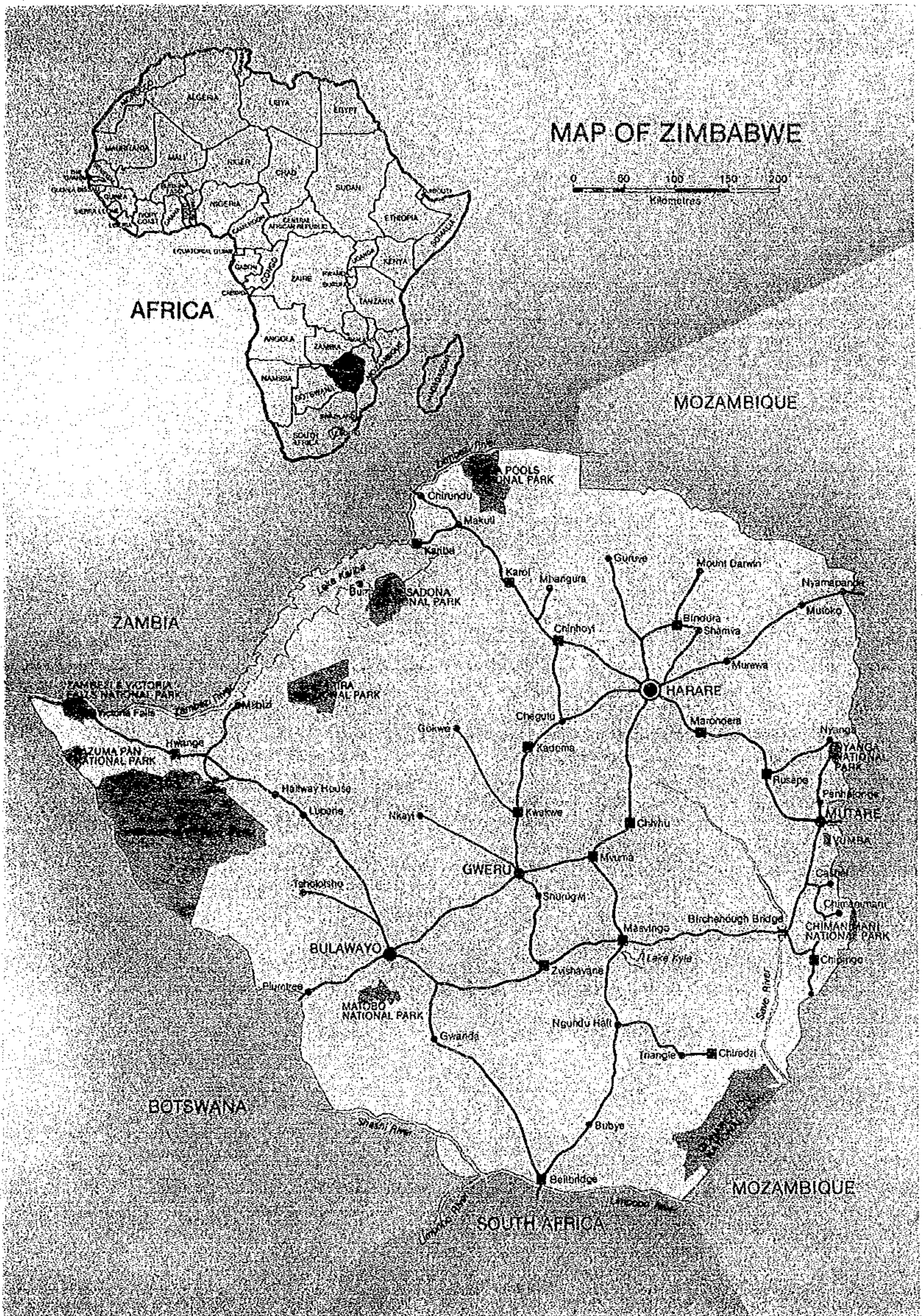
The team exchanged views on the Project with the officials concerned of the Government of Zimbabwe and conducted a field survey. After the team returned to Japan, further studies were made and the present report has been prepared.

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 sincere appreciation to the officials concerned of the Government of the Republic of Zimbabwe for their close cooperation extended to the team.

March, 1990

Kensuke Yanagiya
President
Japan International Cooperation Agency


MAP OF ZIMBABWE
0 50 100 150 200
Kilometres
AFRICA
MOZAMBIQUE
ZAMBIA
BOTSWANA
SOUTH AFRICA
MOZAMBIQUE
HARARE
BULAWAYO
GWERU
MUTARE
Chirundu
Makuti
Kariba
Karoi
Mhangura
Guruve
Mount Darwin
Nyamapanda
Mutoko
Bindura
Shamva
Chinhoyi
Murewa
Chegutu
Marondera
Gokwe
Kadoma
Nyanga
Rusape
Kwekwe
Nkayi
Chivhu
Mvuma
Hwange
Halfway House
Lupane
Victoria Falls
Tsholotsho
Shurugwi
Masvingo
Birchenough Bridge
Zvishavane
Lake Kyle
Chipinge
Plumtree
MATOBO NATIONAL PARK
Gwanda
Ngundu Halt
Triangle
Chiredzi
Save River
Bubye
Beitbridge
Shashi River
Limpopo River
CHIMANIMANI NATIONAL PARK
Chimanimani
Penhalonga
VUMBA
Cashel
NATIONAL PARK

SUMMARY

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The Republic of Zimbabwe, still a young nation that only won its independence in April 1980, is at present vigorously advancing its national development under the Five-Year Plan (1986-1990).

The Government of Zimbabwe, based on its conviction that conveying information to the people widely and effectively is most essential in promoting its national development plans with maximum efficiency, has steadily been emphasizing the importance of TV broadcasting.

In response to the expectations of the Government, the Zimbabwe Broadcasting Corporation (ZBC), the only TV broadcasting organization in the country, has been contributing greatly to national development, not only by conveying information to the public but also by broadcasting programmes designed to promote the people's well being, such as those promoting education and helping enhance the standard of living.

The existing TV transmitting facilities of the Harare Transmitting Station, which has as its service area a densely-populated district with the capital city of Harare at its centre, consist of facilities used for two TV services, viz., TV-1 (general programmes) and TV-2 (educational programmes). TV-1 broadcasts on two channels; one with a 0.2kW transmitter (manufactured in 1959) using the 61-68MHz frequency band (Band-Ⅰ, CH.4) and the other with a 2kW transmitter (manufactured in 1975) using the 174-181MHz frequency band (Band-Ⅲ, CH.5). TV-2, on the other hand, broadcasts on a single channel with a 0.7kW transmitter (manufactured in 1976) using the 195-202MHz frequency band (Band-Ⅲ, CH.8). Although the standard life of a transmitter is 10-15 years, both of the transmitters used for TV-1 and TV-2 are already in a considerably advanced stage of superannuation. Moreover, the manufacturers have already stopped producing spare parts for those transmitters, thus making it extremely difficult for the ZBC to procure spare parts. The situation has been made even more difficult by the fact that, on account of the shortage of foreign exchange in Zimbabwe, the ZBC is financially in no position to provide itself with a redundancy system, such as installing a stand-by transmitter. As a result, ZBC occasionally suffers from suspensions of broadcasting services owing to transmitter breakdowns.

In order to resolve these problems and to ensure that more and more people in the country are provided with broadcasting services through stable and high-quality radio transmissions, the Government of Zimbabwe

has requested Japan to provide grant aid to enable renewal of the transmitters.

In response to this request, the Government of Japan decided to conduct a Basic Design Study for the "Plan to Improve the TV Broadcasting Network in the Republic of Zimbabwe," and, accordingly, the Japan International Cooperation Agency (JICA) sent a Basic Design Study Team to Zimbabwe for 27 days from November 14 to December 10, 1989.

The main items of equipment to be installed or supplied under the Project are as follows:

1.	VHF 5kW TV Transmitter System All solid-state type and including dummy load, auxiliary units and a stand-by transmitter; for TV-1 and TV-2	2 sets
2.	Programme Input Equipment	2 sets
3.	Measuring Equipment	1 set
4.	Feeder Line for Transmitting Antenna	1 set
5.	Stand-by Power Source	1 set
6.	Spare Parts	1 set
7.	Construction Materials and Equipment, etc.	1 set

Among the tasks to be carried out under the Project, those for which the Zimbabwean side is to be responsible are:

1. Construction of a new transmitter building
2. Construction of an engine generator building
3. Laying of power-supply cable between the above-mentioned two buildings

The new transmitter building and the new engine generator building are scheduled to be constructed near the existing transmitter building.

The construction work to be undertaken by the Zimbabwean side at its expense will be taken charge of by the ZBC. As for the term of construction, the work will be started immediately upon conclusion of the E/N between the governments of Japan and Zimbabwe and will be completed within eight months.

A total of 13 months are scheduled for the various work under the Project, including about 3 months from the signing of the E/N to the completion of the tendering process and about 10 months required for the manufacture of equipment and the construction work.

The ZBC will act as the implementing organization for the construction work and operation of the Project. The ZBC has a long years of experience and remarkable achievements in the field of broadcasting and has been engaged in both operation and guidance under a well-established system. The technical level of the staff is comparatively high and, therefore, there seems to be no need for concern with regard to the operation and maintenance of equipment after implementation of the Project.

As a result of the renewal of equipment and the increase in output of the transmitting facilities at the Harare Transmitting Station, the broadcast service area will be expanded widely throughout the suburbs of the city of Harare. The following table shows a comparison of the size of the service area and the served population at the present time and after completion of the Project. This estimation indicates that an additional 370,000 residents will be served by TV-1 and 570,000 by TV-2 as a result of the Project.

Comparison of Broadcast Service Areas

Service Area / Media	Broadcast Service Area			
	Population (in 10,000 persons)		Area km² (Figures in ( ) are radius in km)	
	Present	After Project	Present	After Project
TV - 1	110	147	11,300 (60)	25,450 (90)
TV - 2	90	147	9,500 (55)	25,450 (90)

[Note] Total area of Zimbabwe: 390,245km²

As outlined above, the Project can be expected to contribute dramatically to the society of Zimbabwe as a whole through its effects,

such as improvements in the conveying of public information, promotion of education and enhancement of the people's standard of living. Therefore, grant aid from Japan for the Project will be of great significance.

ABBREVIATIONS

ABBREVIATION	SPELLING-OUT
ZBC	Zimbabwe Broadcasting Corporation
RBC	Rhodesia Broadcasting Corporation
NHK	Japan Broadcasting Corporation
PTC	Posts & Telecommunications Corporation
URTNA	Union des Radiodiffusions et Télévisions Nationales d'Afrique
ZESA	Zimbabwe Electric Supply Authority
CCIR	International Radio Consultative Committee
E/N	The Exchange of Notes
PAL	Phase Alternating Line
VHF	Very High Frequency
FM	Frequency Modulation
PIE	Programme Input Equipment
AMSBA	AM Side Band Analyzer
ENG	Electronic News Gathering

CONTENTS

CHAPTER 1 Introduction

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The Republic of Zimbabwe, through its Five-Year National Development Plan, has been making energetic efforts to enhance the living standard of the people and to promote social and economic development. In order to attain these objectives, the Government of Zimbabwe has made available to the people various kinds of TV programmes including foreign and domestic news, health and hygiene education and school broadcasts, as well as conveying, through TV broadcasts, the Government's announcements and public information.

The transmitters in current use at the Harare Broadcasting Station, the ZBC's key stations, were installed on a commercial basis and are of low output covering only the central part of the city area. Those transmitters currently used for TV-1 and TV-2, all of which are more than 15 years old, are already superannuated and frequently experience trouble. Moreover, the procurement of spare parts is extremely difficult and some of the transmitters have been assembled by the ZBC itself,with the result that matching with the previous equipment is difficult. This has caused the reduction in reliability and further lowering of output. Also, as there is no stand-by equipment, there often occur cases where the station is pressed into the position of having to halt broadcasts for many hours.

In order to improve the situation described above, the ZBC, as an organization responsible for contributing to the enhancement of the people's living standard and cultural level, for the promotion of education and for conveying government information, requested Japan to provide grant aid.

In response to this request, the Government of Japan decided to conduct a Basic Design Study and accordingly sent a study team to Zimbabwe for 27 days from November 14 to December 10,1989.

The study team ascertained the background of the Project and the contents of the request and, at the same time, conducted a survey of the existing transmitters, transmitting antenna equipment, power-source facilities, condition of the project site and the reception of broadcasts, and carried out the gathering of materials and holding of consultations with the officials concerned in Zimbabwe.

After completion of the field survey, the study team examined, in the course of its work in Japan, the estimated effects of the Project and the Project's appropriateness to be implemented with Japanese grant aid, drew

up a basic design concerning the contents and scale of facilities that are necessary and most appropriate to be included in the grant aid, and compiled this report.

The Minutes of Discussions, composition of the study team, survey schedule and names of the officials with whom the study team met are all included in the Appendices (1-4) of this report.

CHAPTER 2 Background of the Project

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2-1 Present Condition of Broadcasting in Zimbabwe

2-1-1 Outline of the ZBC

In Zimbabwe, radio broadcasting was inaugurated in 1951 and TV broadcasting in 1959. During those years and up to now, a number of changes have taken place in various aspects of broadcasting in the country. Based on the change in the name of the country following its independence in 1980, the name of the national broadcasting organization was changed from the Rhodesian Broadcasting Corporation (RBC) to the present Zimbabwe Broadcasting Corporation (ZBC).

The ZBC is a semi-state-operated organization under the jurisdiction of the Ministry of Information, Posts and Communications of the Republic of Zimbabwe. The members of the Board of Governors and the Chairman of the Corporation are appointed by the Minister of Information, Posts and Communications. In terms of the form of management, the ZBC may be considered to be a state-operated organization. However, in terms of its financial setup, the ZBC has a self-supporting accounting system and its financial sources are the income from licence fees and commercial broadcasts. The headquarters of the ZBC is located at Pocket-Hill in Harare city.

The operation of the ZBC is conducted in accordance with the provisions of Zimbabwe's Broadcast Law.

(1) Radio Broadcasting

Radio broadcasting was inaugurated in 1951 (which corresponds to Radio No.2 today) and was subsequently expanded in stages by adding new services; Radio No.1 (1963), Radio No.3 (1981) and Radio No.4 (1982).

At the beginning, the broadcasts were transmitted mainly on medium wave and shortwave, but today, as equipment was either newly installed or renewed, the waves used have gradually shifted to VHF FM. The broadcast service area of Radio No.3 and No.4 has not yet reached the level of nationwide coverage, so measures are now being taken to gradually expand the network. The annual radio licence fee at present is 10.5ZD (one Zimbabwe dollar = about 64 Japanese yen at the exchange rate of December 1989).

- As of 1989, the total number of radio receivers in use in Zimbabwe was 750,000 sets (refer to 2-1-6 (2)). This means a ratio of one set to about 2.4 households.
  (Total population of Zimbabwe: 8.6 million. Average number of members per household: 4.7 persons. (From the results of a survey conducted in 1989 by the ZBC)

- The Government of Zimbabwe has set up community listening centres at schools and growth points (centres of cities/towns/villages), in an effort to make effective use of radio broadcasts (especially Radio No.4) in promoting school education and adult education.

1) Programme Contents

Radio No. 1	General programmes for nationwide broadcast (in English)
Radio No. 2	Local programmes in tribal languages (Shona, Ndebele, English)
Radio No. 3	Programmes consisting mainly of music, including special programmes designed for youngsters (in English)
Radio No. 4	School-education and adult-education programmes (Shona, Ndebele, English)

2) Broadcast Hours

Radio No. 1	5:25 - 24:00	Weekdays, Saturdays and Sundays; there are some variations according to season.
Radio No. 2	5:25 - 22:30	
Radio No. 3	5:00 - 24:00	
Radio No. 4	10:30 - 22:20	

(2) TV Broadcasting

TV broadcasting was started in 1959 as commercial broadcasting (the present general TV broadcasting: TV-1) and in 1982, after the nation's independence, broadcasting in colour (PAL-B system) was commenced. After that, in 1986, educational TV broadcasting (TV-2) was started. At present, TV-1 broadcasts general programmes nationwide and TV-2 broadcasts educational programmes to Harare city and its suburbs.

TV-2 is operated under the national budget and is planned to be further expanded into a nationwide network, the same as TV-1. Accordingly, the ZBC has begun examining a plan for allocating transmission channels in such a way as to avoid the interference of signals with neighbouring countries that may result from the future expansion of the TV-2 broadcasting network, and has already drawn up its frequency allocation plans (see Appendix 9).

At present, the ZBC has its TV programme production studios at its Harare and Blawayo broadcasting stations. At these stations, the ZBC broadcasts news and various other types of programmes and produces programmes on its own. TV transmitting stations are built at 14 locations across the country. However, since such stations in the main cities were constructed in the Rhodesian days for the purpose of serving mainly the white community in urban regions, many of them have an output of only 1kW or so. Yet, these stations are still in operation today. The conditions of installations at the existing TV transmitting stations are shown in Table 2-1-1.

The broadcast coverage area at present is about 45% (about 3.8 million people) of the nation's population, as shown in Fig. 2-1-1.

The nationwide broadcasting of news and main programmes is conducted from the Harare and Bulawayo stations, either via the micro wave link of the PTC (Posts & Telecommunications Corporation) or by means of relaying of broadcast waves from the above-mentioned two stations. The broadcasts are conducted simultaneously across the country. The annual licence fee at present is 50DZ including both radio and TV.

Table 2-1-1 Transmitting Facilities of the Existing TV Transmitting Stations

(As of Dec. 7, 1989)

Station Name (Year of Commencement)	Output Power	Channel	Antenna			Power Source		Manufacturer	Programme Relay
			Tower Height	Ant. Arrangement	Gain	Main	Stand-by		
Harare	(kW)		(m)		(dB)		(kVA)		
(1960)	5	4 (Band. Ⅰ)	Approx. 50	4·STA	6	0		Philips	
(1980)	3	5 (Band. Ⅲ)	155	10·2D × 4	11	0	50	LGT	
(1987)	1	8 (Band. Ⅲ)		(Stack·2 Dipole Ant. × Face)		0		LGT	
Bulawayo									
(1960)	1	3 (Band. Ⅰ)	165	4·2D × 4	8	0	35	Philips	PTC μ Link from Harare
(1980)	1	6 (Band. Ⅲ)	165	4·2D × 4		0	35	LGT	
Gweru									
(1970)	5	2 (Band. Ⅰ)	155						
(1979)	5	11 (Band. Ⅲ)	155	4·2D × 4	8	0	25	Philips LGT	PTC μ Link from Harare
Mutare									
(1973)	1	6 (Band. Ⅲ)	60	4·2D × 3	9	0	30	LGT	Ditto
Kadoma									
(1975)	1	6 (Band. Ⅲ)	110	4·2D × 4	8	0	30	LGT	Ditto
Mutorashanga									
(1974)	1	12 (Band. Ⅲ)	155	4·2D × 3	9	0	30	LGT	Ditto
Masvingo									
(1982)	1	7 (Band. Ⅲ)	90	4·2D × 4	8	0	30	LGT	Ditto
Gwanda									
(1982)	1	5 (Band. Ⅲ)	161	4·2D × 4	8	0	30	LGT	PTC μ Link from Bulawayo
Kamativi									
(1985)	5	5 (Band. Ⅲ)	161	6·2D × 4	10	0	30	LGT	Ditto
Inyanga [Rukotso]									
(1984)	1	7 (Band. Ⅲ)	155	4·2D × 3	9	0	30	LGT	Off-Air from Mutare
Gwendingwe [Chipinge]									
(1987)	1	8 (Band. Ⅲ)	90	2·2D × 4	5	0	10	LGT	Ditto
Kariba									
(1987)	0.05	5 (Band. Ⅲ)	60	(2·2D × 3 / 1·2D × 1)	5	0		LGT	PTC μ Link from Harare
Chivhu									
(1989)	1	12 (Band. Ⅲ)	155	10·2D × 4	11	0		LGT	Off-Air from Harare
Victoria Falls									
(1988)	0.1	7 (Band. Ⅲ)	90	2·2D × 2	8	0	10	LGT	Off-Air from Kamativi

(Note) Manufacturer
LGT: Thomson LGT

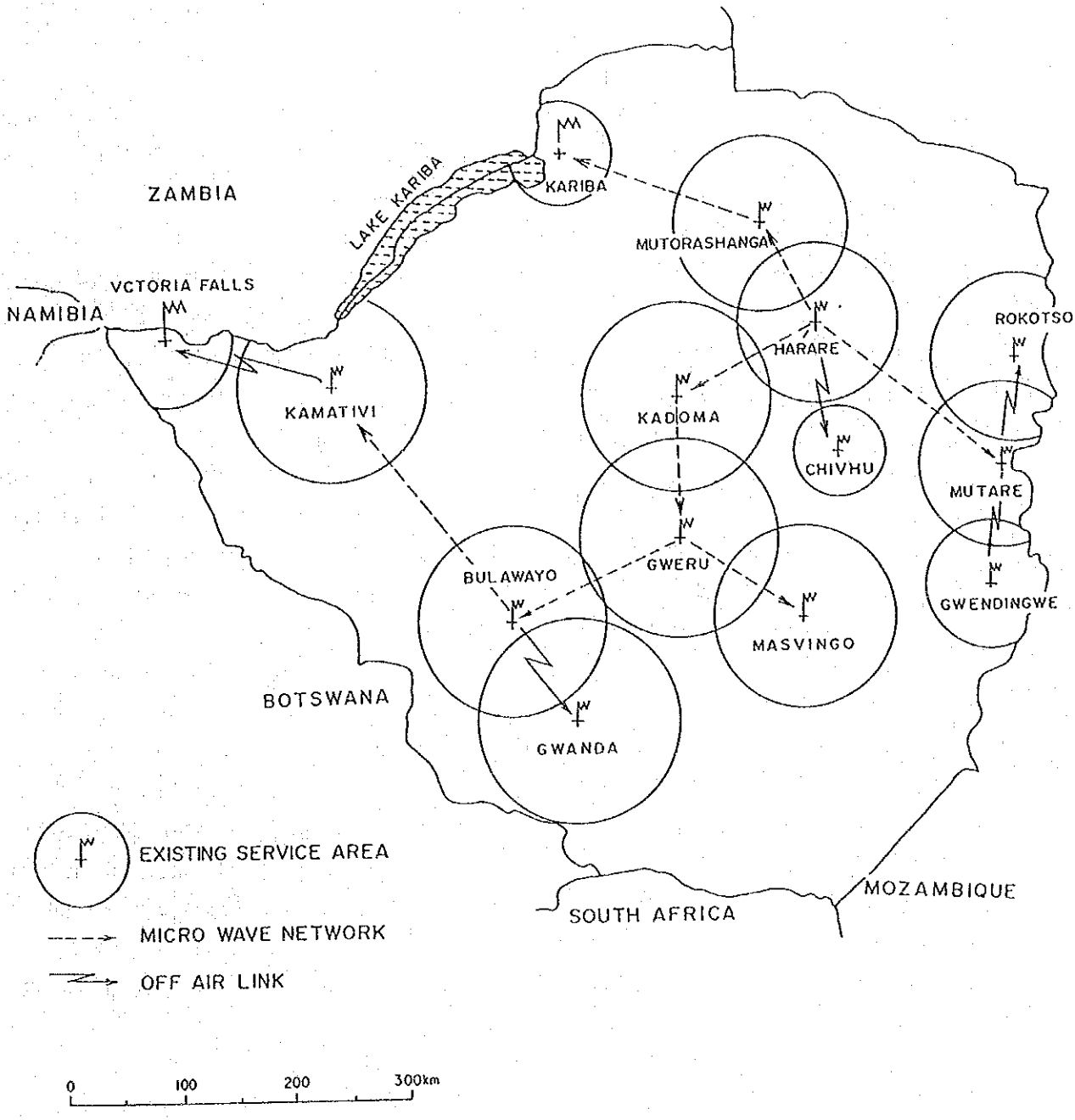


Fig. 2-1-1 Service Areas of the Existing TV Transmitting Stations

1) Present Condition of TV Programmes

The ZBC at present broadcasts general programmes on TV-1 (CH 5) and educational programmes on TV-2 (CH 8).

Making effective use of TV broadcasts, the ZBC actively helps promote the national development plans drawn up by the Government of Zimbabwe. For that purpose, the ZBC conducts programming related to the development of human resources which forms the basis of economic and social development. In other words, the goals of the ZBC in planning its broadcasts are the spreading of education among the people in general, making available to the people livelihood and vocational skills related information that they need, the dissemination of knowledge about health and hygiene, and the providing of entertainment.

The programmes that the ZBC produces on its own are produced mainly at the three studios of the Harare Station and at a studio of the Bulawayo Station. The ratio of the programmes produced independently by the ZBC to the total of the programmes which it broadcasts is about 40%, of which news forms the core.

Furthermore, following the Government's policy to supply the people with the maximum amount of information, the ZBC has installed on the roof of its headquarters building a 4.7m parabolic antenna for reception of satellite broadcasts. With this antenna, the ZBC receives CNN news via the INTELSAT's Atlantic satellite for inclusion in its programming. Such CNN news accounts for about 15% of whole of the programme by the ZBC.

The ratios of programme contents broadcast on TV-1 and TV-2 are shown in Table 2-1-2 and the broadcasting hours in Table 2-1-3, respectively.

Table 2-1-2 Ratios of Programmes by Category

Category	Ratios	
	TV-1 (General)	TV-2 (Educational)
(1) News	15%	16%
(2) Drama	16%	4%
(3) Movies	30%	-
(4) Sports	12%	2%
(5) Educational and Cultural	21%	76%
(6) Music	6%	2%

Table 2-1-3 Broadcasting Hours

Days of the Week	Time of the Day	
	TV-1 (General)	TV-2 (Educational)
Monday through Friday	16:30 — 23:10	16:30 — 22:45
Saturday	12:00 — 24:00	15:30 — 22:45
Sunday	9:30 — 23:30	16:15 — 22:45
Broadcasting Hours/Week	61 hours	45 hours

(a) TV-1 General Broadcasting

Broadcasts on TV-1 consist mainly of news, livelihood related information, talk programmes, drama, music programmes, imported movies and sportscasts and are relayed throughout the country.

The programmes independently produced by the ZBC are produced with a limited budget and using equally restricted equipment. They are nevertheless of high quality, produced with the equipment and through the efforts of the ZBC staff. As for news, in particular, the ZBC is doing all it can to supply the viewers with the maximum range of information by, for example, receiving CNN news via the INTELSAT satellite above the Atlantic and using the materials thus received in the ZBC's news programming. Consequently, viewers of the ZBC's broadcasts are able to receive the main news from around the

world on a real-time basis. The news and current-affairs programmes are broadcast in Shona, Ndebele and English, with the result that such programmes have been enjoying high audience ratings as they are widely regarded as the most intimate source of information by even those people who are not good at understanding spoken English.

The imported movies broadcast by the ZBC are mostly programmes in series which are purchased jointly through the URTNA, the African Broadcasting Union. Equally popular among viewers are cultural programmes, such as documentaries, which the ZBC has obtained through economic assistance offered by foreign countries including Japan.

TV-1 also broadcasts commercials. About 10% of the total broadcasting time is currently alloted to commercials.

(b) TV-2 Educational Broadcasting

TV-2 broadcasts mainly educational and cultural programmes. The greater part of the programmes broadcast on TV-2 consists of documentaries imported from other countries and programmes for transmission to schools to be viewed in the classroom. These programmes are invariably given wide-ranging support by viewers of all ages, from small children to grown-ups. As for news, programmes with the same contents as those broadcast on TV-1 are broadcast on TV-2 at different hours of the day.

In implementing its Five-Year National Development Plan, the Government of Zimbabwe attaches much importance to educational broadcasting and places great expectations on educational broadcasting as a means of supplementing school education which at present is suffering from a shortage of teachers (see Table 2-2-2). Also, in the same way as it does with regard to Radio No.4, the Government of Zimbabwe subsidizes TV educational broadcasting, to which it gives its all-out support as a government project. The ZBC, on its part, has been doing its utmost to enhance the quality of educational programmes but still the programmes cannot be considered sufficient either qualitatively or quantitatively. The reasons for this are that there is a shortage of staff

who can devote their time to the production of the ZBC's own programmes for broadcast on TV-2 and that TV-2 lacks studios or equipment which it can make exclusive use of in producing programmes. Consequently, the production of programmes for TV-2 is actually conducted only in between the production of programmes for TV-1. Thus, in order to overcome such shortcomings, the ZBC has been purchasing a considerable amount of school-broadcast and documentary programmes from overseas, and such imported programmes are being used effectively to maintain the level of the ZBC's programming.

Since TV-2's primary objective is educational broadcasting, which is operated with a subsidy from the Government of Zimbabwe, no commercials are broadcast on TV-2.

Under a long-term plan, the ZBC expects to change the programme production department of TV-2 into an independent system so as to increase the ratio of self-produced programmes to TV-2's total programming. The ZBC also hopes to increase the broadcasting hours of programmes on TV-2 to a level equal to that of TV-1.

2) Present Condition of Facilities

a) Studios

The main equipment currently used in the studios are mostly those manufactured in the 1970s and are mostly of European make, especially the products of Thomson of France. Besides the studio facilities, there are, at the Harare Station, two OB vans, an ENG (Electronic News Gathering) system, and other equipment, but they are all of outdated types manufactured between 1970-80. In this connection, the provision of TV programme production equipment with Japanese grant aid under the E/N concluded in August 1989 (see 3-2-3) is expected to contribute substantially to the increase in the ratio of independently-produced programmes to total TV programming and to raising the quality level of such programmes.

b) Transmitting Facilities

At present, the Harare Station broadcasts two TV services, viz., TV-1 and TV-2. TV-1 broadcasts on CH. 4 (Band Ⅰ) and CH. 5 (Band Ⅲ), while TV-2 broadcasts on CH. 8 (Band Ⅲ).

The actual condition of these transmitters is that, with their progressing superannuation, practically all of them have deteriorated considerably in function, with the result that accidental broadcast suspensions, each for several minutes to about 50 minutes, have been taking place at a rate of two or three times a month. Even though routine broadcasting services are somehow kept going despite such conditions as mentioned above, it is feared that things may get even worse in the future, and the ZBC has expressed its strong desire that urgent measures be taken for renewal of the superannuated transmitters.

Things have been made even more difficult by the shortage of foreign exchange which has been causing a chronic lack of spare parts and a shortage of measuring equipment. Consequently, the ZBC has been unable to take preventive maintenance measures and has been obliged to rely on corrective maintenance. (As to the question of maintenance, see Appendix 6.)

(3) ZBC Headquarters Building

Fig. 4-4-1 shows the outline of the site for the ZBC's headquarters and that of the headquarters building.

The existing buildings of the ZBC's headquarters consist of the administration wing and a two-story building containing three TV studios and seven radio studios. However, on account of the increase in the number of staff members resulting from expansion of the scale of work, the buildings have now become too small and so short of space that a make-shift office room has had to be built to accommodate the staff.

In order to solve this problem and also to enhance the percentage of its independently-produced TV programmes, the ZBC is currently constructing a 4-story building containing a TV studio.

This new building is being constructed right next to the existing building and is scheduled to be completed by fiscal 1991.

2-1-2 Organization and Financial Status

The ZBC, a broadcasting organization placed under the jurisdiction of the Ministry of Information, Posts and Communications of the Republic of Zimbabwe, is financially self-supporting and is operated as a public corporation.

(1) Organization

The ZBC, which possesses rich experience in broadcasting since pre-independence days, is operated on a well-established organizational basis. The level of skill and expertise of the ZBC's technical staff is also quite high and all problems that routinely confront the ZBC, including emergencies, are handled systematically and efficiently.

The organizational chart of the ZBC is given in Fig. 2-1-2, and that of the ZBC's Technical Division, in Fig. 2-1-3.

The numbers of staff members classified by division are as shown in Table 2-1-4. As indicated in the table, the total work force of the ZBC as of November 1989 was 893 persons.

Table 2-1-4 Numbers of Staff Members of the ZBC by Division

Division \ Stations	Harare Hq.	Bulawayo	Mbare (Suburbs of Harare)	Gweru	Mutare	Total
Members of the Board of Governors	8	–	–	–	–	8
Members of the ZBC Board of Directors	25	–	–	–	–	25
Finance & Budget Div.	40	–	–	–	–	40
Sales Div. (Commercials)	42	4	–	–	–	46
Sales Div. (Licence fee)	61	25	–	13	8	107
Technical Div.	90	19	5	26	2	142
Radio No. 1 Production Div.	32	3	–	–	–	35
Radio No. 2 Production Div.	–	19	40	–	–	59
Radio No. 3 Production Div.	13	1	–	–	–	14
Radio No. 4 Production Div.	–	4	27	–	–	31
TV Programme Producton Div.	125	25	–	–	–	150
News Div.	69	3	–	2	1	75
Administrative Div.	125	35	1	–	–	161
Total	630	138	73	41	11	893

(As of Nov. 1, 1989)

Fig. 2-1-2 Organizational Chart of ZBC

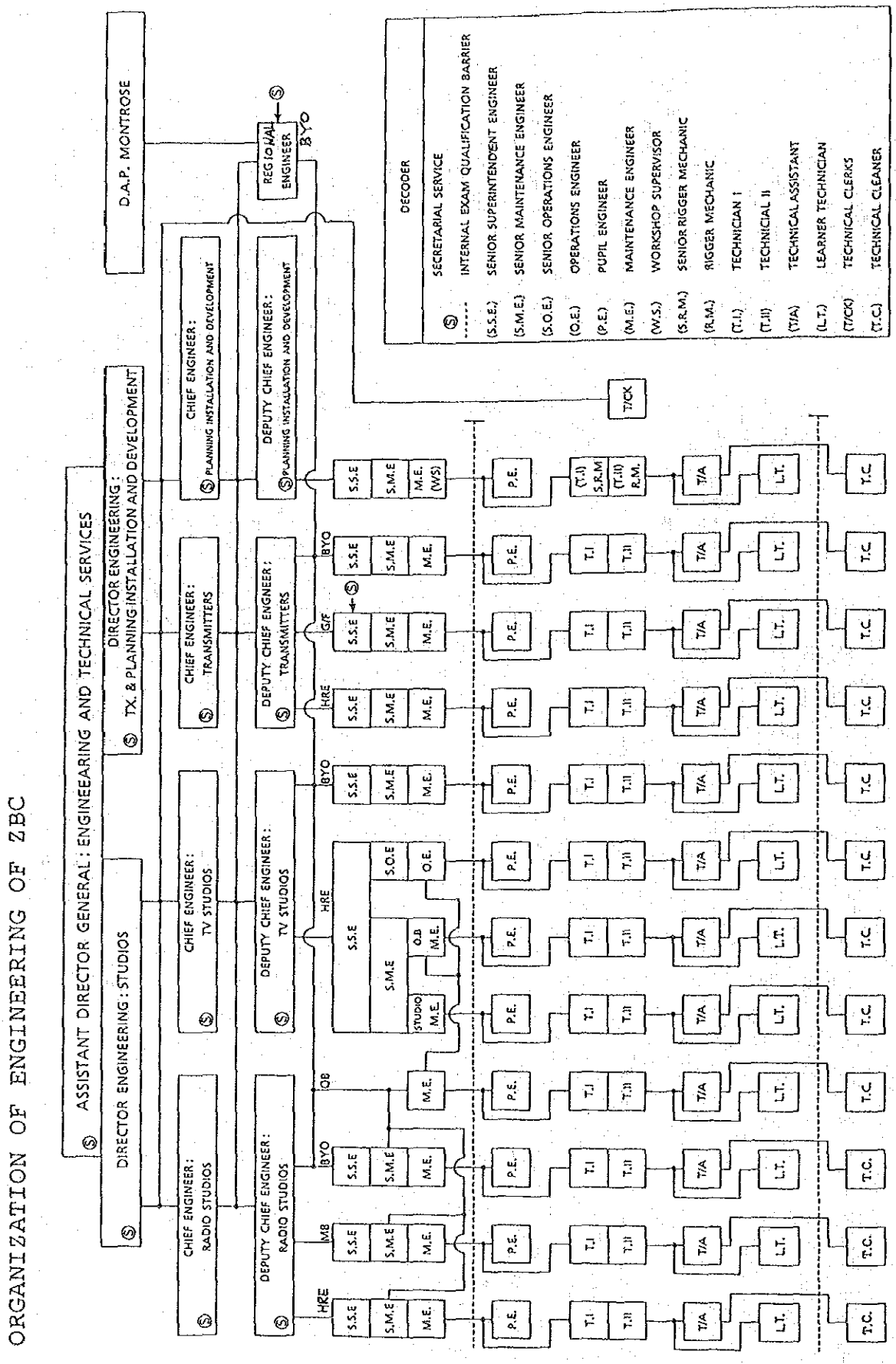


Fig. 2-1-3 Organizational Chart of ZBC's Technical Division

(2) Financial Status of the ZBC

The income and expenditures of the ZBC during the last five years are as shown in Table 2-1-5. With the enrichment of broadcast programming and the expansion of the service area, the ZBC's annual income increased from about 10 million ZD in 1984 to about 20 million ZD in 1988, showing a growth of about a double in four years.

Of the various items of income, it must be noted that the radio and TV licence fees are charged to each "household" as a unit. In the case of radio, for example, each household having radio sets is required to pay the licence fee for one radio set only, no matter how many sets the household may actually own. And in the case of TV, a TV licence applies to both the TV and the radio sets owned by each household.

The current radio and TV licence fees are:

- Radio licence fee (annual) 10.5ZD
- TV licence fee (annual) 50.0ZD

Table 2-1-5 Income and Expenditures of the ZBC

(Unit: 1,000 ZD)

Breakdown \ Year	1984	1985	1986	1987	1988
[Income]					
Licence fees	3,647	4,144	5,023	6,123	6,517
Advertising charges	5,887	6,367	8,230	9,354	10,700
Miscellaneous (Production of CM., etc.)	946	1,132	1,487	1,734	2,766
Total Income	10,480	11,643	14,740	17,211	19,983
[Expenditures]					
Programme Development (production, purchases, material-gathering, etc.)	4,182	4,695	5,520	7,394	8,568
Technical costs	1,917	2,158	2,524	2,526	2,884
Maintenance of equipment (Figures in ( ) are a part of the respective Technical Costs)	(332)	(420)	(488)	(604)	(496)
Financial costs (Exchange losses and interest)	904	1,779	3,658	2,093	2,434
Depreciation	1,511	1,654	1,959	2,242	2,638
Other expenses (relating to the Hq.)	2,416	3,067	3,484	4,184	4,165
Total Expenditures	10,930	13,353	17,145	18,439	20,689
Balance (Surplus/Loss)	-450	-1,710	-2,405	-1,228	-706

The collection of licence fees is done through the post offices, which, after deducting a 4% collection commission, transfer the collected fees to the ZBC. The ZBC, with a view to promoting the collection of licence fees, assigns a total of 63 receiving-contract supervisors throughout the country and has been achieving good results by having these supervisors make door-to door visits to encourage payment of the fees.

As a result of such efforts by the ZBC, the number of households signing the Broadcast-receiving Contract with the ZBC has increased from about 90,000 in 1986 to about 110,000 in 1989. However, the number of households that have not yet signed the contract is estimated at more than double the number of those that have signed.

So, with further efforts made to promote fee collection, the ZBC's financial situation is expected to become increasingly more stable.

The income from advertising charges, on the other hand, has kept on increasing along with the expansion of broadcasting hours. Today, the total number of sponsors exceeds 600 companies and the income from advertisements now accounts for more than a half of the ZBC's annual income.

The income of the ZBC has been showing steady growth every year. During the last three years, the annual deficits have tended to decrease gradually. These deficits are compensated for each year from the Government Fund account which is shown in the Capital section of the ZBC Balance Sheet.

As of the date of the closing of accounts in June 1988, the balance of this Government Fund account was 10,219,000ZD (more than half of the ZBC's total annual income). From the above, it is evident that, even though the ZBC is slightly in the red in terms of independent calculation for a single year, its finances are, on the whole, in sound condition and overall operation has been going on quite smoothly.

The Profit & Loss Statement and the Balance Sheet, both for 1987 and 1988, are included in Appendix 10.

Furthermore, the Government of Zimbabwe considers the ZBC as a public broadcasting organization and, apart from the balance of payments of the ZBC as mentioned above, has been contributing each year to the ZBC as shown in Table 2-1-6. The contribution of the Government, which is annually paid into the Government Fund account, takes the form of government investment and is used for such purposes as the covering of deficits in the ZBC's operational expenses and thus has become an integral part of the ZBC's financial foundation.

The Government's contribution to the educational broadcasting conducted on TV-2 and Radio No.4 is used to cover a part of the expenses to produce or purchase programmes. This government contribution is treated and processed as a part of the national budget, separately from the ZBC's own general account.

In terms of actual figures recorded in 1988, the total amount of the Government's contribution defrayed to the ZBC reached as much as one-third of the ZBC's annual income. From this fact alone, one can realize the extremely high level of commitment made by the Government of Zimbabwe to the nurturing of TV broadcasting.

Table 2-1-6 Contribution Defrayed by the Government of Zimbabwe to the ZBC

(Unit: 1,000 ZD)

Year / Breakdown	1986	1987	1988
Contribution to General Fund	1,831	1,222	1,500
TV-2	——	967	2,816
Radio No. 4	1,585	2,023	2,361
TOTAL	3,416	4,212	6,677

2-1-3 Present Condition of TV Broadcasting Facilities at the Harare Transmitting Station

The Fig. 2-1-4 shows the present broadcast service areas of the Harare Transmitting Station, a key station which has been designated as the object of the Project. This chart has been drawn up on the basis of the estimated values of the field intensity (the strength of the radio waves), the values obtained as a result of actual measurement during the field survey conducted at main locations, and the results of the study conducted on the picture quality by actual viewing of the pictures on TV sets. This field survey was conducted on December 1 and 4, 1989, to measure the field intensity within the radius of about 100km from the centre of Harare city. From the results of this survey, it was found that a picture of good quality can be obtained even in the area where the level of the signals received was lower than the normal standard level. This was due to various reasons, such as the fact that the topography of the suburbs of Harare city and the surrounding areas is flat, a condition that is extremely advantageous in terms of radio wave propagation, and that there are few facilities which cause city noise at the city centre, This means that, as compared with the conditions in the cities of other industrialized countries, the relative broadcast service area has been spreading considerably. The measurement data are given in Appendix 5.

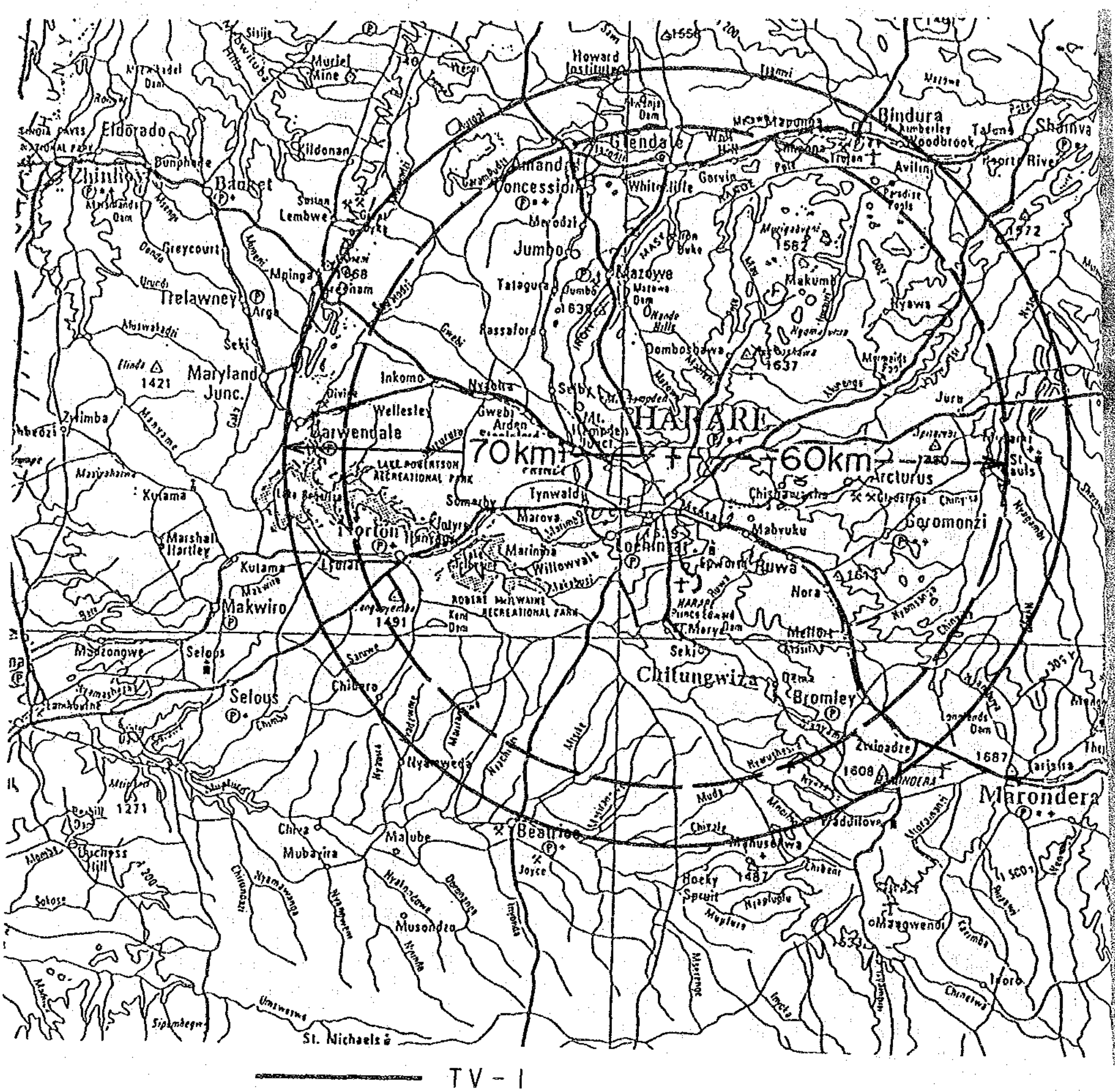
At present, Harare Station broadcasts two TV services, viz., TV-1 (general programmes) and TV-2 (mainly educational programmes). TV-1 transmits its programmes on CH.4 (Band Ⅰ) and CH.5 (Band Ⅲ), while TV-2 transmits on CH.8 (Band Ⅲ).

As will be explained in the following paragraphs, practically all of the transmitting equipment is in an advanced stage of superannuation, and because of the shortage of spare parts and lack of stand-by equipment, it has now become quite difficult to ensure high-quality and stable broadcasts.

(1) TV-1 (CH.4: Band I)

The installations established back in 1959, the year when TV broadcasting was started in Zimbabwe, are still in operation today. On this channel, the same programmes as those currently broadcast on CH.5 are being transmitted. CH.4 continues to be operated simply because there still remain viewers owning only Band I black-and-white receivers. The transmitter now being used is an old generation unit that has been in continued use far beyond the service life of the equipment. The manufacture of this type has already been discontinued and procurement of spare parts for it is next to impossible. Continuation of maintenance and management of this transmitter is no longer possible. At present, when Band III colour TV receivers are gradually spreading among the people, broadcasts on CH.4 are now losing their significance and so CH.4 is scheduled to be abolished when CH.5 on Band III is renewed. When it first began, CH.4 was able to obtain an output of 5kw, but at present measures are being taken to prolong the life of CH.4 by continuing transmission with an output of 200W. For transmission, an STA (Superturnstile Antenna), erected on top of a self-sustained 50m steel tower, is being used.

A 2D Antenna (2 Dipole Antenna) is installed on the side of the upper part of this tower. This antenna was previously used for FM broadcasts, but today it is used for monitoring purposes, viz., to measure the field intensity of the eight main radio broadcasting stations (FM).



TV - 1

TV - 2

[46dBμ conture line]

Kilometres 10 0 10 20 30 40 50 60 70 80 90 100

Fig. 2-1-4 Service Areas of Existing Harare TV Station

(2) TV-1 (CH.5: Band Ⅲ)

CH.5 was started in 1982 for broadcasting in colour, and its station building, steel tower and antenna were installed separately from those of CH.4.

The exciter of this transmitter is a 1975 product of Thomson of France. The output-amplifying unit was assembled by the ZBC itself.

Ever since its opening, the station has always been operated with this single transmitter; no stand-by equipment has ever been installed at the station. Even though its maintenance and management have been performed relatively well, the deterioration of quality due to superannuation is evident. Breakdowns of the equipment occur at the rate of two or three a month. Consequently, under such conditions as described above, once an unforeseeable accident takes place, the broadcasting service is suspended for a long time and this requires the staff to take immediate steps for recovery. In the transmitter room are installed a total of six transmitters to broadcast on four radio (FM) waves and on TV CH.8 as well as CH.5. The conditions here cannot be assessed as being good, in view of such shortcomings as inadequacy of the building structure and the insufficient measures taken against heat-radiation from the transmitter and protection of the equipment against dust and vibrations. The shortcomings mentioned above are also related to the deterioration in the effectiveness of the equipment.

Fig. 2-1-5 shows the present layout of radio and TV transmitters in the transmitter room.

The TV transmitter roughly consists of two units, viz., the exciter unit and the output-amplifying unit that is right behind the former. (See the Basic Design Chart given in 4-4-5 and also Fig. 4-4-6.)

The exciter is divided into two parts; one for video and the other for audio. The signals coming from the studio are modulated here and are converted into high frequency. Since its output is as small as about 0.1W, the signals are sent into the adjoining output-amplifying unit so that the rated output may be amplified; video to 5kW and audio to 0.5kW, respectively. (At present, because of superannuation, video output is less than 2kW and audio output less than 0.2kW.)

Normally, the exciter unit and the output-amplifying unit are designed and manufactured under a unified design concept and the transmitter is completed after assembling and adjustments.

However, in the case of the transmitter currently used at the Harare Station, the exciter being used is one that was previously used at Kwe-Kwe, a regional station, and the output-amplifying unit is a vacuum-tube amplifier assembled by the ZBC itself. As a result, there is no guarantee of the quality of the transmitter as a system.

Furthermore, because of the insufficient matching between the exciter and the output units in their characteristics, the vacuum-tube amplifier does not work well and this, coupled with the deterioration in effectiveness, has become a cause of the shortening of the service life of the equipment. The life of the vacuum tubes currently in use is estimated at less than 5,000 hours, which, compared with the service life of vacuum tubes of an equal type used by NHK and others in Japan, is about half.

Furthermore, because this transmitter is of a system in which video and audio signals are amplified simultaneously with a vacuum tube (manufactured by Tomson; TH-361), it has the shortcoming that fluctuations in the effectiveness of the vacuum tube have a substantial effect on the output and the picture quality, even though it has the advantage of being compact in its structure. For this reason, this system is almost never adopted in Japan's standard-type VHF transmitters, the system generally adopted in Japan being one in which video and audio signals are amplified by separate amplifiers and are then combined.

(3) TV-2 (CH.8: Band Ⅲ)

CH.8 was inaugurated in September 1986 when the Conference of the Non-aligned African Nations was held in Harare city. Since then, CH.8 has been broadcasting TV-2 programmes (mainly education-related programmes). The transmitter being used is the one which originally had been intended for installation at the Matopos Station (output 1kW, made in France). For this transmitter, too, there is no stand-by equipment and its output has now fallen to less than 0.7kW. The transmitting antenna is used jointly with TV-1 (CH.5) through a 2-channel combiner (made in Italy).

In addition to the rated output of this transmitter being as small as 1kW, the equipment, manufactured in 1976, is already superannuated, with the result that the output has dropped further, causing a big gap in service area and picture quality of 2 degree sas compared with TV-1.

Meanwhile, in this country where the people are highly education-oriented (see Notes below), complaints are frequently heard about the

deterioration in picture quality from the residents of the suburbs of Harare city.

[Notes]

1. Of all government spending, the expenditure on education is the largest. As the following data indicate, expenditure on education accounts for nearly 20% of the national budget each year. (Source: 1987-89 government publications.)
   1984/85: 16.7%, 86/87: 15.7%, 87/88: 15.2%,
   88/89: 17.1%, (projected)
2. The compulsory education at elementary school is free of charge, and the percentage of school attendance in Zimbabwe is the highest among all African countries (see Appendix 11).

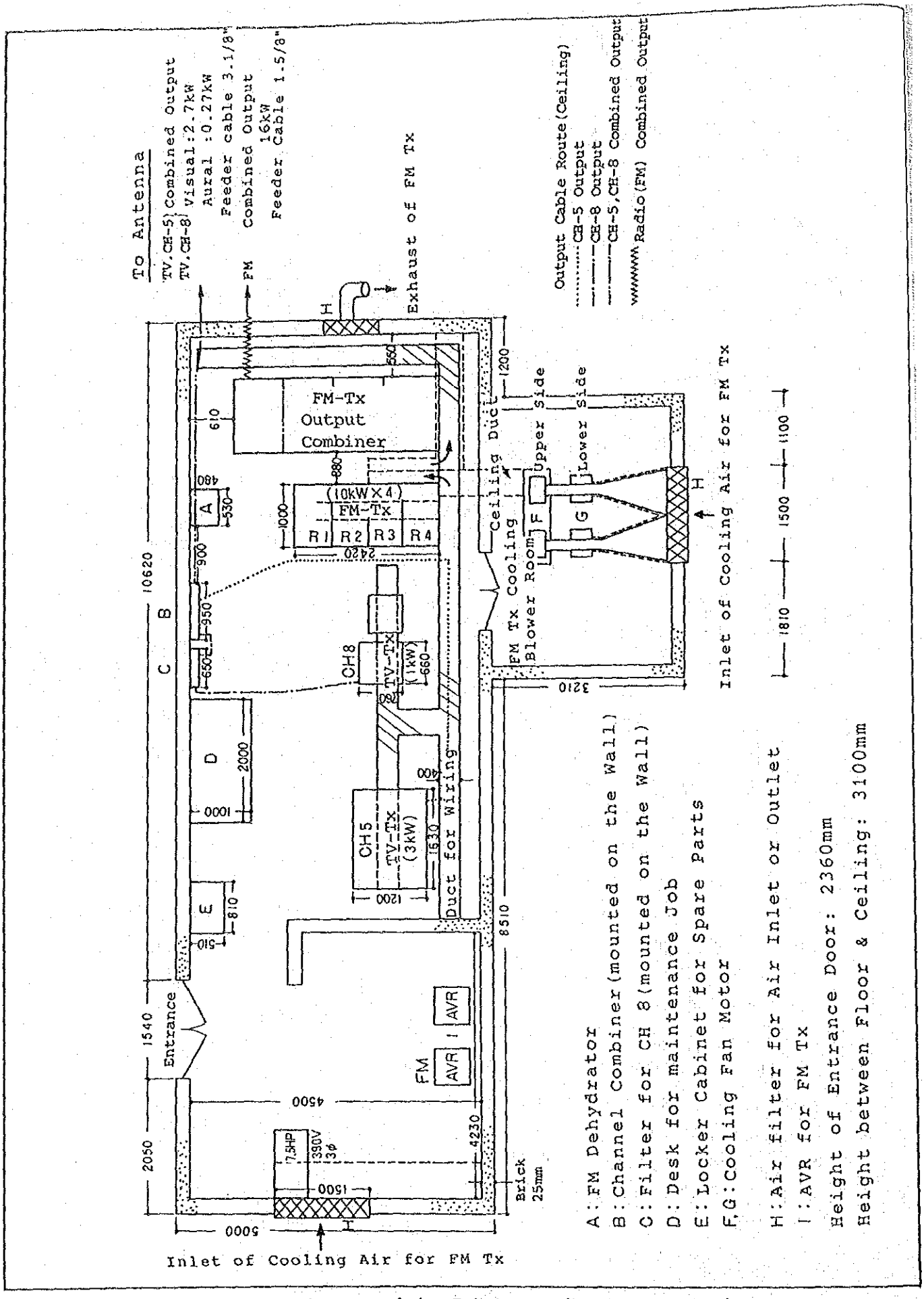


Fig. 2-1-5 Layout of the Existing Radio & TV Transmitters at the Harare Station

(4) Programme Input Equipment and Programme Transmission Lines

Programme input equipment normally includes such built-in units as input/output signal monitor and demodulator. So, the monitoring of transmitting equipment is quite easy. In the case of the existing CH.5 and CH.8, however, there are no such built-in units and, consequently, the staff in charge is required to check each section of the transmitting equipment visually, taking many hours.

For the programme transmission lines (between studio and the programme input equipment for the transmitter), coaxial cables are used. But since 1972 there has been the problem of power-source noise (a 50Hz hum which is about 0.6 volt to one volt of the video signal) overlapping the video signals and causing deterioration in picture quality. For the present, no adquate solution has been found.

As possible causes of this power-source noise, defective earthing, imbalance in load, etc., can be considered.

In order to cope with this problem, the ZBC introduced optical-fiber cable manufactured by Telefunken of West Germany and this has led to an improvement of about 23dB. However, there still remains a degree of noise. In order to lower the noise to an acceptable level, an improvement more than 17dB would be necessary.

The solving of this power-source noise problem has been strongly requested by the ZBC and it, indeed, is one of the problems that should be solved under the Project which is to be implemented.

[Note] The above-mentioned optical-fiber system was a sample offered by the manufacturer to be used experimentally. (Non-standard specification)

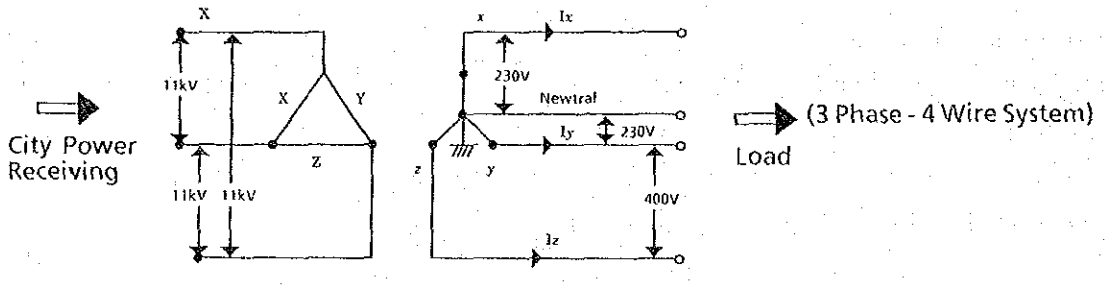
(5) City Power Source

The city power consists of two series of incoming 11kV high-voltage power. Such units as the power-receiving transformer beyond the high-voltage main switch are assets of the ZBC, although their maintenance is done by ZESA (Zimbabwe Electric Supply Authority). During the period of the field survey, measurements were conducted of the voltage and load current on the secondary side of the transformer in the presence of the ZESA officials in charge. As a result, a considerable imbalance in the current was noticed between the phases (see Fig. 2-1-6). To pinpoint the cause of this phenomenon, a recommendation was made that the actual

condition of the load should be investigated by the ZBC so that measures for improvement may be taken.

This inter-phase imbalance can be considered as one of the causes of the power-source noise phenomenon which is occurring on the programme transmission lines. The diagrams showing the power-source systems are given in Figs. 4-4-2 and 4-4-3.

[Note]



Receiving Power Transformer: 500kVA

[Rating]	Voltage	Current
Primary:	11kV	
Secondary:	230V/380V	800A ($Ix = Iy = Iz$)

[Present Condition]

Primary:	11kV	I
Secondary:	230V/380V	Ix, Iy = 450A. Iz = 350A

[Remarks]

Normal Condition: Load current should be balanced
($Ix \fallingdotseq Iy \fallingdotseq Iz$)

Fig. 2-1-6 Unbalanced Condition of City Power Source Load Current

(6) Engine Generator

As a stand-by power source, a small diesel-engine generator (50kVA) is installed for the TV and radio (FM) transmitter room and TV studios. The equipment has been maintained well. However, if the power needs of the TV studios are also considered, the total station requirement would be a maximum of about 400kVA. So, in terms of capacity, this generator is quite inadequate, as the power it is capable of supplying in the event of a city power failure is only about 50kVA. In the case of a failure of the city power source, the installations for TV-1 (CH.4 and CH.5) and TV-2 (CH.8) will be supplied with power by the stand-by equipment but, in this case, it must be noted that it would take 10 minutes or so before the

generator engine starts, owing to such procedures as the manual switching of the power lines and adjustments that need to be made in various divisions to adjust the load to below 50kVA.

Furthermore, because of load restrictions, the operation of some studio equipment needs to be halted, and this results in the paralyzation of operations. For these and other reasons, the effectiveness of the generator as the current stand-by power source has been reduced to half.

The switch for power-receiving is installed on the wall.

The generator is supplied with fuel manually from the supply tank at the rate of 200 liters per fill, which is enough to keep it in continuous operation for about 10 hours. Maintenance of the equipment is conducted every Wednesday when a test run of about 30 minutes is also made.

(7) Antenna Equipment

In 1982, when colour TV broadcasting was started on CH.5, a 155m stayed steel tower was constructed and, on top of this tower, a 2-Dipole pannel antenna, assembled by the ZBC on its own, was installed. The antenna power-feeding parts (cable, power divider, etc.) were purchased from Thomson (France) and the installation and wiring work was carried out by the ZBC itself. Since then, in order to improve performance, the antenna was replaced with one manufactured by Thomson.

As a result of visual checking done on the feeder cable, antenna, tower component materials, anchors for the stays, etc., it was found that the antenna equipment has been kept in fine condition; partly due to the good environment without such hazards as damage from salt or air pollution. No major defects were noticed, such as damage or deterioration caused by erosion, with the exception of some slight rusting seen on some of the metal fastenings of the stays for the tower. As for the rust, repainting of the tower is scheduled for 1990, so a recommendation has been made to the ZBC that necessary repairs be done on that occasion.

As a result of inspection of the feeder cable and the way the parts are attached, some inappropriate sections were noticed. Some of these sections give rise to apprehension about their long-term durability, while others seemed to show some lack of skill in their design and construction work. However, there should be no problems in the future, since those defective parts are due to be renewed within the range of this project.

2-1-4 Maintenance and Operation

(1) Maintenance of Transmitting Equipment

As to the maintenance and management of equipment, the items to be checked by day/week/month/year are each stipulated and maintenance and management are conducted in conformity with such stipulations (a maintenance planning table is given in Appendix 8). However, because of the inadequacy of measuring equipment, the ZBC staff are more or less obliged to depend on the five senses, such as in visual checks of equipment, checking for the generation of unusual noises and unusual heat, or visually checking indications on the meter attached to each unit of equipment. In emergency cases, they sometimes borrow appropriate measuring equipment from the PTC for use in restoring the equipment from any damage sustained.

While the ZBC has the capability of conducting preventive maintenance [Note] to positively prevent accidents before they actually occur, they are unable to do so, simply because they do not possess an adequate amount and variety of measuring equipment. Of the ZBC's measuring equipment, only a few pieces are actually usable.

[Note] As reference materials, "Equipment Failure and Maintenance" and "Redundancy System and Reliability of Transmitters" are included in Appendicies 6 and 7. These include such information as measures taken to deal with failures, reliability and practical methods of equipment maintenance.

(2) Composition of Technical Staff

The staff members in charge of operation and maintenance at the Harare Station are as follows:

1) Technical Staff	Total : 90 persons
Sound studio	18 persons
TV studio	9 persons
Transmitting station	9 persons
Others	35 persons

2) Classification of Personnel by Job-ranking

a) Sound studio — Total : 18 persons

Director	0
Chief Engineer	1
Deputy Chief Engineer	1
Senior Superintendent Engineer	2
Senior Maintenance Engineer	2
Technician	12

b) TV studio — Total : 9 persons

Director	1
Chief Engineer	0
Deputy Chief Engineer	1
Senior Superintendent Engineer	0
Senior Operations Engineer	1
Maintenance Engineer	1
Technician	5

c) Transmitters — Total : 9 persons

Director	1
Chief Engineer	1
Deputy Chief Engineer	1
Senior Superintendent Engineer	1
Senior Maintenance Engineer	0
Maintenance Engineer	1
Technician	4

(3) Work System (at the transmitting station)

A two-shift system is adopted. In case of equipment failures, construction work, etc., they make it a practice to organize a special work system.

(4) Division of Responsibility for Maintenance

The division of responsibility for maintenance of equipment at TV and radio stations throughout the country is as shown in Table 2-1-7. The management of maintenance work is taken charge of by the staff of each main broadcasting station concerned.

Table 2-1-7 Division of Maintenance and Management

Station in charge	Maintained Station
Harare	Harare, Chivhu, Mutorashanga, Kadoma, Kariba, Gokwe, Karoi, Kwekwe
Mutare	Mutare, Rukotso (Inyanga), Gwendingwe (Chipinge)
Masvingo	Masvingo, Rutenga, Beitbridge, Chiredzi
Gweru	Gweru
Bulawayo	Bulawayo, Gwanda, Kenmur, Kamativi, Victoria Falls

(5) Repair of Failures

For the whole of the ZBC, the accidental suspension of broadcast services occurs at the rate of about 4-5 times (more than 3 minutes each) a month. Many of the causes of such accidents are thunderbolts. In the case of the transmitters, the portions that break down most often are the power-source section, output-amplifying unit (defective contact of cavity, in the case where vacuum tubes are used), and defective contact in the magnet relay system.

Occasionally, scenes were witnessed where the manager himself was personally taking the lead in the repair work, holding a soldering iron in his hand. It is quite important to enhance the technical level of the engineers through that kind of on-the-job training and to bolster the supply of capable workers. This applies also to those who are in charge of work relating to transmission techniques.

The fact, however, is that most of the regional transmitting stations scattered across the country are manned only by security staff who are simply safeguarding the stations; no engineer is stationed at almost any of the transmitting stations. Hence, when an accident occurs and the technical staff in charge of management is unable to cope technically with the accident, a veteran engineer would be required to rush to that station from the Harare Station in order to solve the problem. During the period of about one month when the study team was in Zimbabwe for the field survey, such senior engineers as a Deputy Chief Engineer or a Senior Superintendent Engineer (SSE) were seen making several emergency trips to repair failed equipment at one or another of the regional stations.

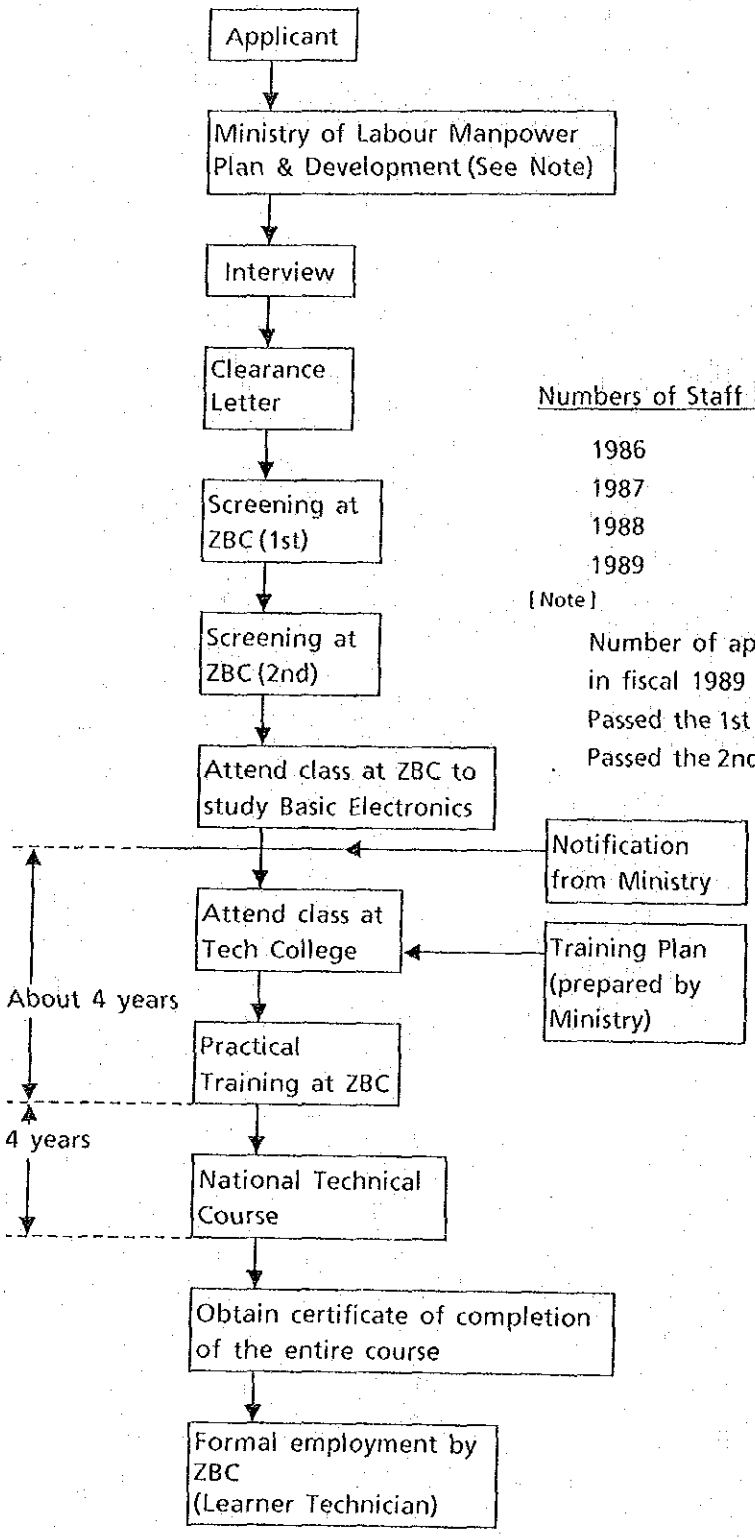
2-1-5 Education and Training of Staff

(1) Employment of New Staff

1) Flow Chart Showing the Process of Employment of a New Technical Staff Member

- The employment of new staff is conducted irregularly.
- Those eligible for employment are individuals with an educational background of at least graduated High School, who have studied English, mathematics and science at school.

Flow Chart Showing the Process of Employment of a New Technical Staff Member



Numbers of Staff Members Employed Each Year

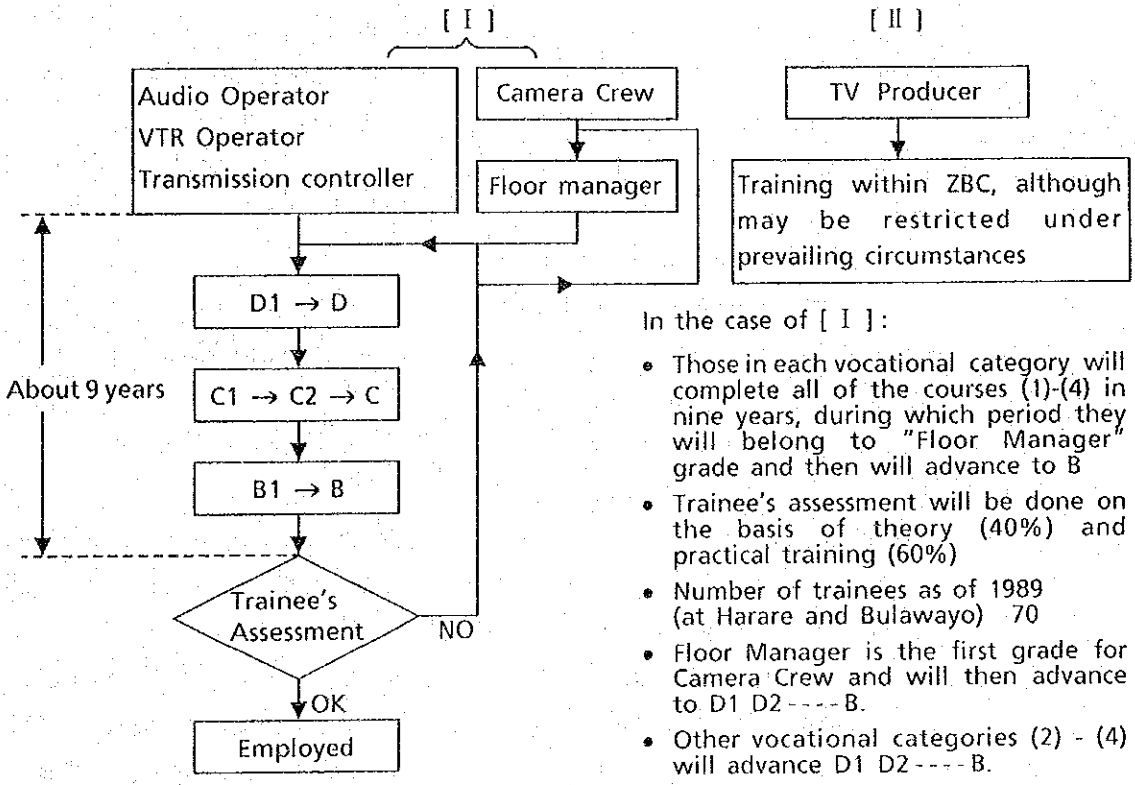
1986	7
1987	9
1988	8
1989	8 [See Note]

[Note]

Number of applicants in fiscal 1989	1800
Passed the 1st Screening	30
Passed the 2nd Screening	8

2) Flow Chart Showing the Process of Employment of a New Programme-production Staff Member

- The training is given in the form of on-the-job training in the ZBC.
- The training will be conducted separately for two groups of staff members; [I] the vocational group consisting of (1) Camera crew, (2) Audio operator, (3) VTR operator and (4) Transmission controller - Video switching; and [II] those that belong to the vocational category of TV producer. The training for the latter may sometimes be subject to some restrictions.
- The flow chart for training is as follows:



In the case of [I]:

- Those in each vocational category will complete all of the courses (1)-(4) in nine years, during which period they will belong to "Floor Manager" grade and then will advance to B
- Trainee's assessment will be done on the basis of theory (40%) and practical training (60%)
- Number of trainees as of 1989 (at Harare and Bulawayo) 70
- Floor Manager is the first grade for Camera Crew and will then advance to D1 D2 - - - - B.
- Other vocational categories (2) - (4) will advance D1 D2 - - - - B.

3) Budget

a) In the Case of Technical Staff:

- The salary will be borne by the Ministry of Labour Manpower Plan & Development
- The training expenses incurred at the Tech College will be borne by the Ministry of Labour Manpower Plan & Development

- The costs of stationery, etc., will be borne by the ZBC
- Expenses incurred during the training at the ZBC will be borne by the ZBC

b) In the Case of Programme-production Staff
- Expenses will be borne by the ZBC
- Every Wednesday, using the existing studio equipment as teaching materials, training lasting about 4 hours will be conducted. However, in the case where studio is being used for broadcasting, such training will be suspended.

(2) Training of Staff

1) Training Facilities

Audio training room within the ZBC building 1

Studio (currently in the process of improvement; to be used as a TV studio) 1

2) Current Status of Training

a) Using the above-mentioned facilities, training will be given to those who have actual work experience at the ZBC.

b) On-the-job training will be conducted at each work-site.

c) training is conducted in various forms, for example, the training given on the occasion when the staff is sent abroad to receive the delivery of equipment ordered from a manufacturer overseas, in which case the work of inspection and acceptance of the ordered equipment at the factory will be used also for the training of the staff concerned. There also is the training given on the site where the equipment is being installed.

d) Participation in training courses and seminars held in industrialized countries, such as the U.S., Britain, France, West Germany and Eastern European countries.

- The numbers of participants in TV engineering training courses conducted in West Germany (1981-1988) were as follows:

1981	2
1982	4
1983	1
1988	6

e) Numbers of ZBC staff members who were sent overseas during 1989 by the ZBC (including those sent for the purpose of taking part in a training course, a seminar or an international conference)

Male 55
- 20 - for technical training, seminar, inspection trip, etc.
- 35 - non-technical staff, including programme producers, announcers and news reporters

Sent to Europe, the U.S., etc.

Female 11 . . Programme producers, news reporters, announcers, etc., for training or for participation in seminars, women's conferences, etc.

Sent to Europe, the U.S., etc.

3) Officers in Charge of Staff Training

One officer of managerial level in the staff administration division is in charge of training.

Since that officer is required also to act as a lecturer for technical trainees, he is required to undertake a formidable amount of work. Increasing the number of lecturers and augmentation of teaching materials are urgent problems that need to be tackled now.

2-1-6 Spread of TV Receivers in Zimbabwe

(1) Spread of Radio and TV

According to estimations made by the ZBC, the number of radios and TVs in use in Zimbabwe as of 1989 would have reached about 400,000 sets throughout the country. (Source: the Public Market Survey - from among the materials formally submitted by the ZBC; see Fig. 2-1-7)

Of these, about 110,000 sets are those which have been formally registered with the ZBC. And of these 110,000, about 60,000 are formally-registered sets in Harare city.

(2) Production of TV Receivers in Zimbabwe

Zimbabwe is the country that ranks second in Africa in the development of its machine industry, next only to the Republic of South Africa. Zimbabwe possesses the technology for the manufacture of TV receivers and has actually produced TV receivers. The World Radio System and Supersonic are the two major manufacturers of TV receivers in this country. At present, however, owing to lack of foreign exchange and the resultant shortage of main parts, those companies are operating at only about 30% of capacity. Of the two, Supersonic is export-oriented, shipping some 90% of its output to neighbouring countries.

The actual output of the two companies in 1988 was about 900 sets each, which corresponds to about 30% of capacity. In view of the ongoing improvement of Zimbabwe's economic condition, it seems that the day will not be too far off when a total output of 6,000/year (of which about 45% are to be exported) in planned capacity can be expected to be achieved.

From 1986 to 87, the domestic economy of Zimbabwe continued to remain depressed. However, this country has apparently been emerging from its depressed state of late, as can be seen from the December 6, 1989 issue of the local daily, The Herald, which reports on the relaxation of controls over the issuance of import licences.

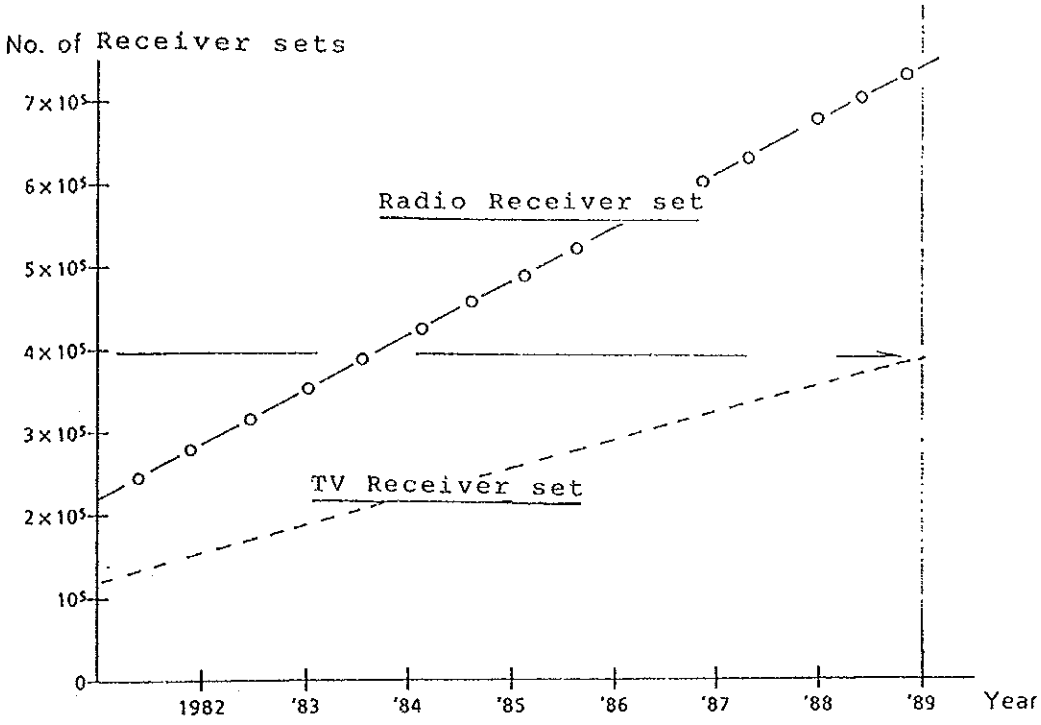


Fig. 2-1-7 Spread Rations of TV and Radio Sets

(Source: The Public Marketing Survey included in the materials submitted by ZBC)

2-1-7 Present Condition of Radio Broadcasting Facilities

Radio broadcasting in Zimbabwe was inaugurated in 1951 (corresponding to Radio No.2 of today). Since then, the radio broadcasting services have gradually been expanded; the start of Radio No.2 was followed by Radio No.1 (1963), Radio No.3 (1981) and radio No.4 (1982), in that order. Even though there are some variations between the different services in broadcast coverage, Radio No.1 and Radio No.2 have already attained coverage that is close to 100% (see Fig. 2-1-8)

(1) As shown below, the frequencies used by different radio channels are VHF-FM (frequency band: 97.78MHz - 106.9MHz), medium wave (frequency band: 585kHz - 1368kHz) and shortwave (frequency band: 3306kHz - 6045kHz).

Frequency Bands Used by Different Radio Channels:

Radio No.1 : VHF (FM), medium wave, shortwave	General programmes for nationwide broadcast (in English)
Radio No.2 : VHF (FM), medium wave, shortwave	Local programmes in tribal languages (Shona, Ndebele, English)
Radio No.3 : VHF (FM)	Programmes consisting mainly of music, including special programmes for youngsters (in English)
Radio No.4 : VHF (FM) and shortwave	School-broadcast programmes and adult-education programmes (Shona, Ndebele, English)

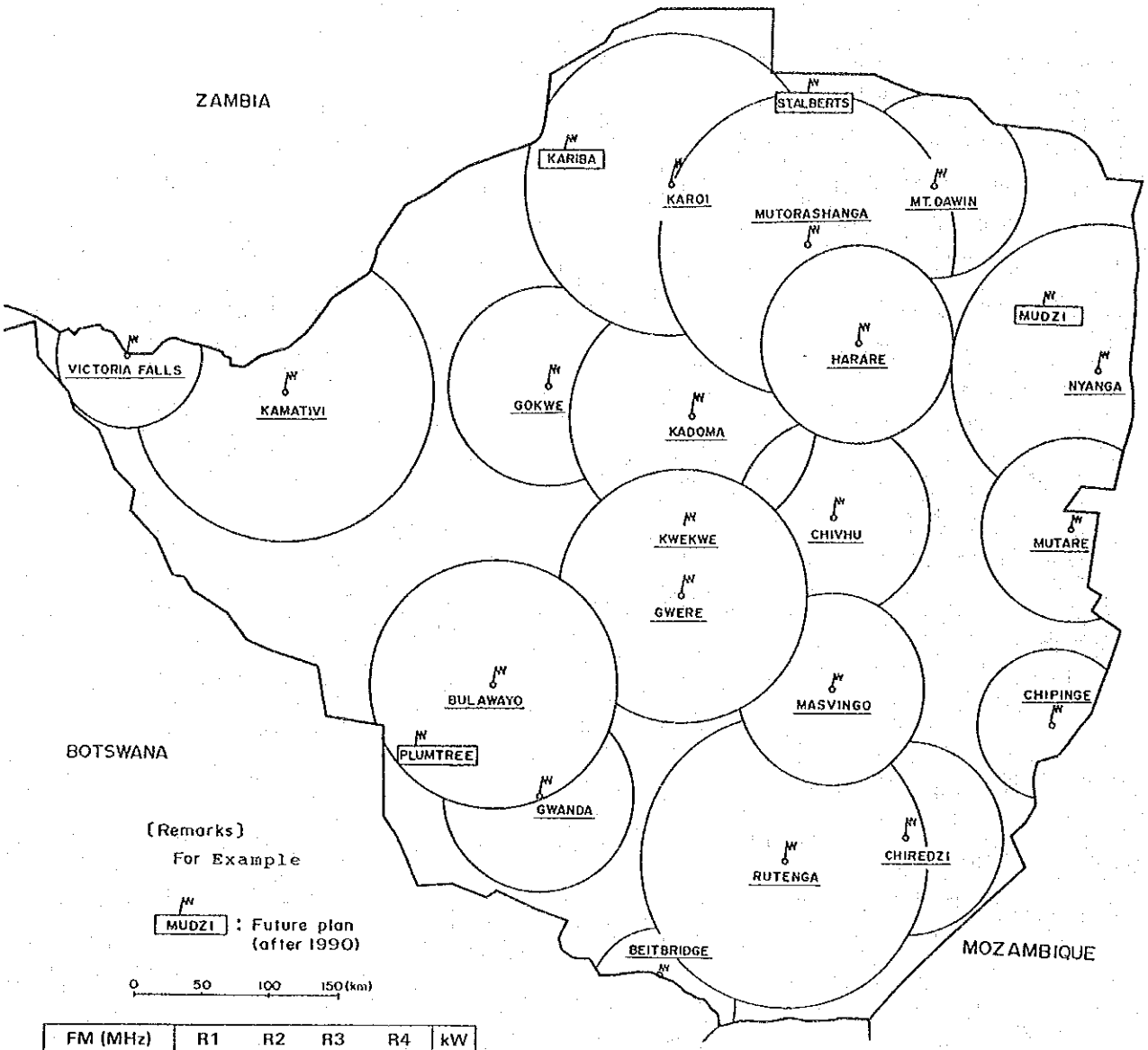
(2) The VHF-FM broadcasts are superior to those on either medium wave or shortwave in the following points: they are more economical in that installations can be made effective use of (that is, the building and the antenna tower can be shared with TV), they ensure high sound quality and no interference (especially at night), and they also surpass either the medium wave or shortwave broadcasts in operation and maintenance. Hence, most of the radio stations in Zimbabwe have already shifted to VHF-FM, with the result that, at present, only a

few radio stations in the country are still using either medium wave or shortwave.

(3) Overseas Broadcasting

Zimbabwe is not conducting any overseas radio service at present. There are, however, plans to start overseas services in the future to North America, Europe, India and South Africa.

(4) A list of transmitting facilities of the existing radio stations is given in Table 2-1-8.



FM (MHz)	R1	R2	R3	R4	kW
Harare	92.80	96.0	99.3	102.8	10
Mutoroshanga	104.7	94.3	91.1	101.1	5
Mt. Darwin	88.9	92.0	95.2	102.0	5
Karoi	99.9	96.6	93.4	90.3	5
Mutare	102.2	89.1	95.4	98.7	3
Rukotso	105.3	88.6	94.9	101.7	5
Bulawayo	90.0	96.3	99.6	103.1	10
Hwange	91.5	98.0	94.7	101.5	5
Gweru	90.7	93.9	97.2	100.7	5
Masvingo	106.5	92.9	99.4	102.9	5

(Allocated Frequencies (Main Station))

Fig. 2-1-8 Service Areas of the Existing Radio Stations

Table 2-1-8 Transmitting Facilities of the Existing Radio Stations

(December, 1989)

Station		No. of Channels	TX Output (kW)	Manufacturer	Stand-by Power (kVA) (Manufacturer)	Antenna Mast Height (m)	Remarks
1.	HARARE	4 (FM)	10	TFN	50 (PETTER)	150	
2.	BULAWAYO	4 〃	10	TFN	50 (Ford)	129	
3.	GWERU	4 〃	5	Nortron	25 (Ford)	155	FM & MW are servicing
4.	MUTARE	4 〃	5, 3	RCA	30 (Ford)	60	
5.	KADOMA	4 〃	10	TFN	30 (Ford)	110	
6.	MUTORASHANGA	4 〃	5	RCA	30 (Ford)	155	
7.	KAROI	4 〃	5	RCA	30 (Ford)	155	
8.	MASVINGO (GLENLIVET)	2 〃 2 〃	5 5	Nortron RCA	30 (Ford)	155	
9.	KAMATIVI	4 〃	3, 5	RCA	30 (Ford)	161	
10.	MT. DARWIN	2 〃	5	RCA	30 (Ford)	155	1990. 4 channel
11.	VICTORIA FALLS	1 〃	1	RCA	10 (PETTER)	30	1990. 4 channel
12.	GWANDA	4 〃	3, 5	RCA	30 (Ford)	161	
13.	CHIPINGE	3 〃	1	Nortron	10 (Ford)	100	
14.	RUTENGA	4 〃	10	TFN	30 (Ford)	155	
15.	RUKOTSO (NYANGA)	4 〃	5	RCA	30 (Ford)	155	
16.	GOKWE	3 〃	5	LGT	70 (Ford)	155	1990. 4 channel
17.	BIET BRIDGE	2 〃	1	RCA	30 (Ford)	30	1990. 4 channel
18.	KWEKWE	1 (MW)	0.1 1.0	Collins RCA			
19.	KARIBA	0 (FM)				51	1990. 4 channel
20.	CHIVHU	4 〃	1	LGT		155	
21.	CHIREDZI	4 〃				155	
22.	KENMAUR	4 〃	5	LGT		155	
23.	PLUMTREE	0 〃					1990. 4 channel
24.	MUDZI	0 〃					1990. 4 channel
25.	ST. ALBERTS	0 〃					1990. 4 channel

2-2 Future Plans for TV-1 and TV-2

2-2-1 Prospective Plans for TV-1

(1) Installation Plans

The Government of Zimbabwe plans under Phase I (short-term plan) to renew the superannuated transmitters at the existing TV stations in five main cities and to expand the national broadcasting service area from the present 45% to 60%. And under Phase II (medium-term and long-term plans), the Government plans to further expand the service area, eventually to 75%, by newly constructing transmitting facilities at 13 regional stations. With the completion of these plans, the Government of Zimbabwe aims at achieving efficient social development by making effective use of the TV media. The outline of these plans is shown in Table 2-2-1.

(2) Frequency Plan

As a result of the remarkable expansions of TV broadcasting networks in the African countries, a readjustment of the international allocation of frequencies became necessary. Thus, in 1986, a CCIR conference for the African region was held in Nairobi to decide on the allocation of frequencies to each country. Appendix 9 shows the current conditions of main stations of the ZBC and the projection of future frequency allocations.

Table 2-2-1 Phase I and Phase II Plan for the TV-1 Broadcasting Network

Phase	Station	Content
I	Harare	1. VHF 5kW VT Transmitters, existing/stand-by ···1 set (1) Dummy load (2) Channel combiner (3) AVR and Distribution Board 2. Programme Input Equipment ···1 set (1) Monitor, Adjustment units (2) Transmission cable, Hum canceler 3. Measuring Equipment ···1 set 4. Feeder cable for antenna ···1 set (1) Main feeder cable and Branch cables (2) Junction boxes 5. Stand-by Power Source ···1 set (1) Diesel engine generator (2) Control panel 6. Spare Parts··· 1 set for transmitter, feeder cable and engine generator, 7. Installation Materials
	Bulawayo	1. VHF 5kW TV Transmitters ···1 set 2. Feeder cable for antenna ···1 set 3. Transmitting antenna ···1 set 4. Engine generator ···1 set 5. Programme Input Equipment ···1 set 6. installation materials ···1 set
	Gweru	The same as Bulawayo
	Mutare	Ditto
	Masvingo	Ditto
II	Rutenga	1. VHF 1kW TV Transmitter ···1 set 2. Transmitting Antenna ···1 set
	Gwendingwe	Ditto
	Beitbridge	Ditto
	Kariba	1. VHF 3kW Transmitter ···1 set 2. Transmitting Antenna and Feeder cable ··· 1 set
	Mt. Darwin	Ditto
	Plumtree	1. VHF 1kW Antenna and Feeder ···1 set 2. Transmitting Antenna and Feeder ···1 set

Phase	Station	Content
II	St. Alberts	Ditto
	Hwange	Ditto and Tower, Area
	Zvishavane	Ditto
	Mashava	Ditto
	Mberengwa	Ditto
	Mudzi	Ditto

2-2-2 Prospective Plans for TV-2

(1) Present Status of Educational TV in Harare

The Government of Zimbabwe has over the years been devoting its efforts to the nurturing of human resources as the nucleus of the national development. And based on this national policy, the Government has always allocated a large percentage of the national budget to various measures to promote education. The current ratio of the budget allocated to education is as high as some 20% of the total national budget, the largest percentage share of the entire budget of Zimbabwe.

The ratio of elementary school attendance in Zimbabwe at present is the highest of all the African nations (See Appendix 11). However, with the increase in population, the insufficient number of teachers has now become an acute problem. The following table shows the number of children each elementary school teacher is required to teach, by year.

Fiscal year	1979	1983	1985	1986	1989
Number of pupils enrolled	819,128	2,044,487	2,216,878	2,228,000	2,230,000
Number of Teaching Staff	18,483	50,937	55,900	56,691	59,000 (estimation)
Pupils enrolled per Teaching Staff	44	40	39.7	39.3	37.8 (estimation)

(Statistical Yearbook, 1985/1986, UN)

As a measure to cope with this situation, plans have been made to increase the capacity of the courses for prospective elementary school teachers at the universities, as follows:

Fiscal year	1979	1983	1985	1986	1989
Incremental Numbers of Teachers	8,330	9,004	9,510	10,030	10,287

(Published by the Government of Zimbabwe: "First Five Year National Development Plan)"

As a result of implementation of these plans, the number of children taught by each teacher is estimated at about 37-38 in fiscal 1989. This, as compared with the 39 pupils to each teacher in 1986, shows a slight improvement but, compared with the situation in other countries (Table 2-2-2), the shortage of elementary school teachers still continues in Zimbabwe.

As a measure to supplement the number of teachers, the Government of Zimbabwe makes sure that TV educational broadcasts are made effective use of and places great expectations on the expansion of the curricula using audiovisuals teaching materials. The TV-2 programmes are used at elementary schools and growth-points to supplement the number of teachers, and this has been effective.

[Note] Growth-points: Centre of municipalities

However, the actual condition of TV-2 at present is , as mentioned in 2-1-3 (3), that it is not performing its functions adequately because of insufficient facilities, with the result that TV-2 has been finding it difficult to live up to the Governments expectations. Hence, the renewal of TV-2's transmitters under the Project is considered both necessary and appropriate.

(2) The First Phase Plan for the Educational TV Network

Transmitting equipment shall be newly installed at six locations in order to cover the capital city and its neighbouring areas that are economically and socially important, including the second largest city, Bulawayo. When this plan is implemented, the coverage will have been increased to 45% of the national territory. At the same time, in order to

further improve production and broadcasting of local programmes using different local languages, one TV studio shall be newly constructed in each of the stations in Harare and Bulawayo. The outlines of these plans are shown in Table 2-2-3.

(3) The Second Phase Plan for the Educational TV Network

In order to cover the medium and small local cities and their surrounding areas, which were not included in the first phase plan, transmitting facilities shall be newly set up at the 17 locations listed in Table 2-2-3. As a result of the implementation of this plan, coupled with the outcome of the first phase plan, TV-2's coverage will reach 75%. Furthermore,in order to ensure production and broadcasting of local programmes that are more intimate and more carefully designed, a TV studio shall be newly constructed at four locations.

(4) Frequency Plan

Please refer to 2-2-1 (2).

Table 2-2-2 Comparision of Number of Teachers and Children in Elementary Education in Different Countries

Country	Number of Primary Schools	Number of Teaching Staff	Number of Pupils enrolled (× 1000)	Pupils enrolled / Teaching Staff
Zimbabwe (86)	4,234	56,691	2,230	39.3
Sudan (85)	6,707	50,089	1,738	34.7
Zambia (85)	2,894	3,555	115	32.3
Kenya (86)	11,996	13,000	432	33.2
Japan (86)	24,901	457,767	9,872	21.5
China (86)		5,413,600	131,825	24.4
Indonesia (86)	105,000	1,078,597	29,883	27.7
Malaysia (87)	6,557	102,356	2,274	22.2
Philippines (86)	33,000	212,602	9,204	43.3
Thailand (86)		356,844	7,400	20.7
Iran (86)	49,000	258,062	7,233	28.0
Iraq (86)	11,000	123,310	2,291	23.6
Saudi Arabia (86)	7,433	90,535	1,460	16.1
Turkey (86)	47,192	216,859	6,704	30.9
Australia (84)	8,460	102,853	1,571	15.3
Belgium (85)	2,261	68,420	728	10.6
Czechoslovakia (86)	6,332	97,385	2,089	21.5
France (85)	67,000	239,438	4,118	17.2
German [Fed. Rep] (85)	22,455	133,471	2,272	15.9
Italy (86)	28,786	276,553	3,531	12.8
Netherlands (85)	9,467	87,814	1,469	16.7
Poland (86)	16,791	307,798	4,920	16.0
Sweden (85)	5,399	40,488	600	14.8
Great Britain (86)	25,326	244,000	4,550	18.6
USSR (90)	67,500	2,668,000	23,930	9.0
Canada (86)	15,595	301,777	2,270	7.5
USA (86)	10,100	1,371,000	21,117	19.7

( ): Survey Year
86 → 1986

[International Statistics Data, 1989
Japanese Government]

Table 2-2-3 Phase I and Phase II Plan for the TV-2 Broadcasting Network

Phase	Station	Content
I	Harare	[Transmitter] 1. VHF 5kW TV Transmitters, Existing/Stand-by ···1 set (1) Dummy load (2) Channel combiner (common use with TV-1) (3) AVR and Distribution board 2. programme Input Equipment ···1 set (1) Monitor and Adjustment units (2) Transmission cable, Hum canceler 3. Measuring Equipment ···1 set 4. Feeder cable for Antenna ···1 set (1) Main feeder for Antenna ···1 set (2) Junction boxes 5. Stand by Power source ···1 set (1) Diesel engine generator (2) Control panel 6. Spare Parts ···1 set For transmitter, feeder cable and engine generator 7. Installation Materials [Studio] 1. Camera 2. Visual/Aural Switcher 3. Master Control Room 4. VTR 5. Measuring Equipment 6. Spare Parts } One new room
	Bulawayo	[Transmitter] 1. Transmitters ···1 set the same as Harare (1.~3.) 2. Programme Input Equipment ···1 set except (2), 3.~7. are the same as Harare [Studio] ···the same as Harare
	Gweru	[Transmitter] ···the same as Bulawayo
	Mutare	1. VHF 3kW and 1kW(stand-by) TV Transmitters ···1 set 2~7 the same as Bulawayo
	Masvingo	The same as Bulawayo without studio
	Rukotso	Ditto

Phase	Station	Content
II	Kamativi	[Transmitter] 1. VHF 5kW, 3kW (stand-by) TV Transmitters ···1 set (1) Dummy load (2) Channel combiner (common use with TV-1) (3) AVR and distribution board 2. Programme Input Equipment ····· 1 set (1) Monitor and Adjustment unit·· 1 3. Others are the same as Harare without the Transmitting Antenna in the first phase
	Karoi	[Transmitter] 1. VHF 3kW, 1kW (stand-by) TV Transmitters ··· 1 set 2. Others are the same as Kamativi
	Mudzi	[Transmitter] 1. VHF 1kW x 2 TV Transmitters (including stand-by) ··· 1 set 2. Others are the same as Kamativi
	Plumtree	Ditto
	Beitbridge	Ditto
	Kariba	Ditto
	St. Alberts	Ditto
	Kadoma	Ditto
	Mt. Darwin	Ditto
	Gokwe	1. VHF 1kW TV Transmitter, existing/stand-by
	Zvishavane	Ditto
	Rutenga	Ditto
	Gwendingwe	Ditto
	Gwanda	Ditto
	Victoria Falls	Ditto
	Mutorashanga	Ditto
	Chipinge	Ditto

2-3 Outline of Related Plans

The Five-Year National Development Plan (1986-1990), which is currently in progress, holds the following targets.

Targets of the National Development Plan:

(1) Promotion of economic growth and reform of economic structure
(2) Land reform and effective utilization of the land
(3) Enhancement of the living standard
(4) Expansion of employment and qualitative enhancement of labour power
(5) Development of science and technology
(6) Harmonizing of development and environment
(7) Others

The above-mentioned National Development Plan is further broken down into the following specific plans:

1. Agriculture and Regional Development
   - Increase in agricultural output
   - Enhancement of living standard (health, education, transportation, communication and daily necessities) of the provincial residents (about 70% of the total population)

2. Promotion and Development of industries including Manufacturing and Mining
   - In order to change the economic structure and to achieve the projected economic growth at an early date, there is the need to carry out overall development including the manufacturing industry, agriculture and mining.
   - The development of the mining industry will contribute to the acquisition of foreign exchange through exports and to the promotion of employment. Hence, there is the need of developing new mines.

3. Development of Energy, Natural Resources and Water Sources
   - Measures will be taken to promote the development of electric power, coal, hydraulic power, natural gas, solar energy, etc., to hold down imports of energy materials and to promote self-sufficiency.
   - Preservation of the natural environment through such measures as promoting self-sufficiency in timber (construction materials, pulp, fuel), tree-planting, improvement of water sources, irrigation and dams.
   - The primary objective of the development of water sources should be the supplying of water to agriculture, industries and private households (especially for public use). Consequently, the Government will endeavor to secure water resources and to improve the regional water-supply facilities.

4. Development of Transportation and Tourism
   - The transportation network shall be expanded and the nation's dependence on South Africa in overseas trade shall be reduced.
   - The functions of the Tourism Development Association will be reinforced and efforts expanded to include more regions of the country, so as to promote not only the acquisition of foreign exchange but also the expansion of employment opportunities.

5. Development of Mass Communications and the Means of Providing Information.
   - Refer to 2-3-1

6. Development of International Trade
   - An International Trade Association (state-run) shall be established, so as to promote such measures as the reinforcement of quality control of export goods, adjustment of export prices and protection of consumers.

7. Plans for Construction and Housing/Urban Development
   - Measures shall be taken to supply city residents with functional sanitary and low-priced housing through the improvement of facilities at the growth-points and regional centres. By making

effective use of these facilities, vocational guidance shall be given to the people and employment opportunities shall be expanded.

- Improvements shall be made to water works, drainage and roads in the cities, and an Urban Development Association and growth-points shall be established to promote the improvement of urban and housing environments.

8. Social Development and Promotion of Social Welfare
   - The enhancement of people's awareness as they take part in the Five-Year National Development Plan.
   - Establishment of facilities to enable the people to earn income through their self-sustained efforts.
   - Spreading of knowledge on primary health and the promotion of preschool education and adult education.

9. Development Concerning Health
   - Expansion of services concerning health.
   - Elimination of infectious diseases: improvement of contammated drinking water.
   - Elimination of malnutrition: especially, improvement of the nutritional balance of meals taken in the provincial regions.
   - Of primary importance are the basic health measures.

10. Development of Human Resources
    - Development of human resources is necessary as a means of promoting economic and social development.
    - Promotion of school education.
    - Expansion of institutions to educate prospective teachers and establishment of vocational training centres.
    - Improvement of such existing educational institutions as agricultural or technical universities, and additional establishment of technical training centres.
    - Establishment of training centres, overall health training centres, etc., for government employees.

11. Development of Science and Technology
    - Science and technology are essential as a means of social and economic development. Economic development will increase the

labour productivity and the expansion of employment opportunities will lead to the projected reform of the production system in the nation's economy.

2-3-1 Contents of the "Development of Mass Communication and the Means of Providing Information, "as stated in the Five-Year National Development Plan

The main characteristics seen in the development plans drawn up for different sectors are that the development of the provincial districts is extensively incorporated into the plans.

Under the development plan for mass communication and the means of providing information, which was referred to in item 5 above, it is planned, as mentioned in the list of targets, that the information network should be expanded to include even the remotest provincial regions so that information may be conveyed equally to all the people across the country. This plan also evaluates highly the information-conveying effects of TV broadcasting, saying that TV, which possesses both speed and audio-visual capacity, far surpasses other media forms such as radio and newspapers as a medium of communication, especially for people with a low level of literacy.

This plan concerning the development of mass communication and information-converying media also proposes measures for the establishment of growth-points, as well as the improvement of TV broadcasting and other media, in order to provide more knowledge and experiences to provincial residents through the promotion of education, so as to enable those people to enjoy self-sustained and independent lives.

Under the development plan mentioned above, the ZBC is provided with a budget of 25 million ZD (about 1.6 billion yen).

2-3-2 Relation Between the Five-Year National Development Plan and TV Broadcasting

With each of the different sectors assigned with the task of implementing the above-mentioned development plan, TV broadcasting is related through its programmes as follows:

(1) TV-1 Programmes

1) The news programmes contain almost all of the information concerning each sector.
2) The programmes dealing with animals, science, vocational training, etc., are related to the sectors concerned with natural resources, science and technology and social development, respectively.

(2) TV-2 Programmes

1) The news programmes contain almost all of the information concerning each sector.
2) The programmes dealing with school-broadcast programmes and health, with science and life sciences, or with the open university, etc., are related to different sectors, such as those concerned with development of human resources, health, science and technology, social welfare, etc.

2-3-3 Development Plan for TV-2

Examinations are currently being made within the framework of a Five-Year plan for the period from 1986 to 1990. A budget of 9.7 million ZD (about 621 million yen; 1 ZD = 64 yen) has been provided. The breakdown of the budget is as follows:

1987/88	2.7 million ZD (178 million yen)
1988/89	3.0 million ZD (192 million yen)
1989/90	4.0 million ZD (256 million yen)

Under this budgetary plan, it had earlier been planned that, in 1990, transmitting facilities should be installed first in Bulawayo, the second largest city, and then in other major cities including Gweru and Mutare. However, owing to a shortage of foreign exchange, none of these plans has yet been implemented.

The development plans of different sectors as mentioned above have been quoted from the "First Five-Year National Development Plan" (1986-1990, Volume II, April 1988) published by the Government of Zimbabwe.

2-4 Background and Contents of the Request

The Government of Zimbabwe, in the Five-Year National Development Plan it has drawn up, evaluates highly the roles TV broadcasting can play as an effective means of promoting completion of the Plan, in view of TV's characteristics of "Visibility, Audibility and Instantaneity." The Government especially focuses its attention on the impact TV broadcasting has on the society as a whole.

On the other hand, however, it is becoming increasingly difficult for the ZBC to maintain routine broadcasting operations owing to the superannuation of the transmitting facilities at TV stations in major cities. In addition, partly because of the inadequacy of the service areas covered, the conveying of necessary information to the suburbs of the main cities where the concentration of population has been going on, as well as to the provincial districts, has been experiencing difficulties.

With a view to solving these problems, the Government of Zimbabwe had earlier planned the renewal of the superannuated facilities, increasing the output of transmitters, construction of new regional stations and other measures to improve and expand the nation's TV broadcasting network, and has been carrying on the improvement and expansion work, even though gradually. However, the actual state of affairs is that such efforts have so far not produced sufficient results owing to the shortage of funds (foreign exchange) to purchase new equipment.

For the reasons mentioned above, the Government of Zimbabwe, in an effort to ensure early accomplishment of its goals, has requested Japanese grant aid for the renewal of transmitting facilities. The contents of the request from the Government of Zimbabwe are made up of two parts; Phase I (short-term plans) and Phase II (medium-term and long-term plans). Under Phase I, the renewal of the superannuated transmitting facilities and the increasing of transmitter output will be conducted at the key stations in five major cities to improve and reinforce the nationwide TV network. Under Phase II, 13 regional TV transmitting stations will be newly constructed so as to expand the nationwide TV broadcasting network. (For details, see the Future Plans for TV-1 and TV-2 in item 2-2.) With the implementation of these two phases, it is expected that the broadcast service areas throughout the country will be expanded from the present 45% to 60% and eventually to 75%. In this way, the Government of Zimbabwe

aims at promoting efficient national development making extensive use of TV broadcasting.

The outline of the request from the Government of Zimbabwe is shown in Table 2-4-1.

Table 2-4-1 Outline of the Request

Phase	Station name	Content
I	Harare Bulawayo Gweru Mutare Masvingo	◦ VHF 5kW TV Transmitter (all solid-state type) ◦ Transmitting Antenna ◦ Feeder cable ◦ Engine Generator ◦ Programme Input Equipment ◦ Installation Materials
II	Gwendingwe Gokwe Rutenga Beitbridge	◦ VHF 1kW TV Transmitter ◦ Transmitting Antenna
	Kariba	◦ VHF 3kW TV Transmitter ◦ Transmitting Antenna, Feeder Cable
	Mt. Darwin	◦ VHF 3kW TV Transmitter ◦ Transmitting Antenna, Feeder Cable
	Zvishavane Hwange Mashava Mberengwa Mudzi Plumtree St. Alberts	◦ UHF 1kW TV Transmitter ◦ Transmitting Antenna ◦ Feeder Cable ◦ Tower

In the Basic Design Study, the JICA study team, as a result of consultations with Mr. O. O. Chekeche, Deputy Director-General of the ZBC, which is under the jurisdiction of the Ministry of Information Posts and Communications of the Government of Zimbabwe, has reached agreement that this grant aid shall be confined to the Harare Transmitting Station which

is the key station of the ZBC. The outline of the agreement is as follows:

(1) Outline of the Project

By renewing and increasing the output of the transmitting facilities of the Harare Station, the TV broadcasting service area surrounding Harare city will be further expanded so that a larger number of residents may be provided with more stable and higher quality radio broadcast services.

(2) Implementing Organization: ZBC

(3) Requested Facilities

By renewing the following installations, the functions and reliability of the transmission system will be enhanced.

1. VHF 5kW TV transmitter (into all solid-state, with a stand-by transmitter, an auxiliary equipment set, dummy load and peripheral equipment)
2. Programme Input Equipment
3. Measuring Equipment
4. Feeder Cable for the Transmitting Antenna
5. Stand-by Power Source
6. Spare Parts
7. Materials and Equipment for Construction Use

(4) Supplements to the Contents of the Agreement

The following requests were received from the ZBC to supplement the contents of the agreement made earlier.

1) As regards the transmission system, a strong request has been made that, considering the frequent occurrences of damage caused by thunderbolts to TV-1 and TV-2, an existing/stand-by fully switchable 2-set system should be adopted.
2) The transmitting antenna will not be renewed under the Project, since it was renewed in 1988 by the ZBC.
3) A strong request has been made by the ZBC, expressing its desire to install a stand-by power source with a capacity large enough

to cover all the studio and transmitting facilities at the Harare Station.

4) Because of the overlapping of heavy power-source hum occurring along the transmission route between the studio and the transmitter, a request has been made for the taking of measures to improve this condition.

5) A strong request has been made for the augmentation and allocation of measuring equipment.

6) A strong request has been made that spare parts be supplied in as large a quantity as possible, taking into account the shortage of foreign exchange.