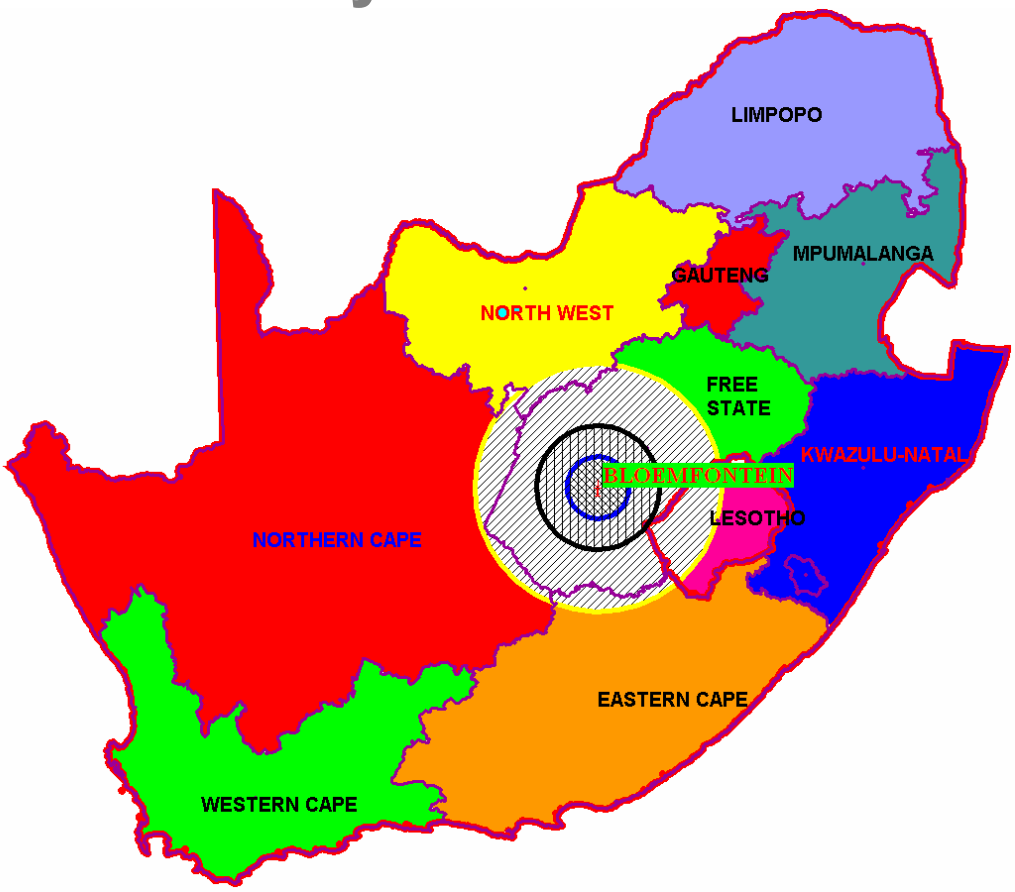
Independent Communications Authority of South Africa



Draft Terrestrial Broadcast Frequency Plan 2004

TABLE OF CONTENTS

ANNEXURE

1 Background

1.1 Introduction

Section 31(1) of the IBA Act, No. 153 of 1993, the Act, states that: 'The Authority shall as soon as may be reasonably practicable after commencement of this Act prepare a frequency plan whereby the maximum number of frequencies available for broadcasting services is determined'. Section 31(5) (a) further indicates that the plan must be reviewed annually.

The Authority published the first final broadcast frequency plan in October 1999. The plan was revised and published in July 2002. It has again been reassessed and updated to reflect broadcasting activities in the past year and technological changes.

1.2 Purpose of the Terrestrial Broadcast Frequency Plan

The purpose of the Plan is to review the 2003 Plan and to look at new considerations. The guiding principles of the development of the plan have remained the same over the years of publications of the plan. The main changes are in the frequency assignment lists.

1.3 Focus of the Terrestrial Broadcast Frequency Plan

This document gives the current broadcasting frequency assignments in South Africa, up to and including 31 August 2004, in the form of tables. This data is stored on the Independent Communications Authority of South Africa's (the Authority's) website (www.icasa.org.za). The current plan does not propose drastic changes to the existing frequency assignments. The Plan is in line with international planning principles and the software used to make the new assignments in the Plan is based on International Telecommunication Union (ITU) recommendations. The frequency assignments listed fall into one of three levels of assignment status. These levels are:

(a) Frequencies assigned and in use (OP or OPE);

(b) Spare frequency assignments in the vicinity of an existing transmitting station site or frequency assignments available for use in the vicinity of a theoretically determined lattice node point (SP or SPA); and

(c) Frequencies licensed and awaiting finalisation of technical parameters or the installation of transmitting equipment (LI or LIC).

The information is provided in tables, which is structured to give the transmitting station name, its geographic co-ordinates, the frequency and the channel, the maximum effective radiated power and the polarisation mode. In cases where the frequency is already in use, the name of the programme service is also given, together with the date it came on air. In each case, it is indicated into which of the three above-mentioned assignment-status levels the frequency assignment falls.

The Frequency Plan has made frequency allocations for terrestrial digital broadcasting. These reservations have been indicated in the table of assignments as a way forward to secure a smooth analogue-digital migration. . The Regional Radiocommunication Conference (RRC) concerning the introduction of digital broadcasting in the VHF/UHF bands to be held in 2005 would be of significant input in finalising the digital frequency assignment part of this plan (refer to section 2.10).

The Authority is also aware of the backlog of frequency assignments, which has to be co-ordinated regionally and internationally and to register them in the International Master Frequency Register maintained by the ITU. This is a priority project and it is receiving all the necessary attention.

2 Principles

The following principles guided the development of this Terrestrial Broadcast Frequency Plan.

2.1 Promotion of Public, Commercial and Community Services (Categorisation of the Plan)

The Terrestrial Broadcast Frequency Plan is categorised into Public National (PNS), Public Regional (PRS), Commercial (CML), Community (CTY), Digital Audio Broadcasting (DAB) and Digital Terrestrial Television (DTT) services. The categorisation took the following issues into account:

- Expressions of interest for commercial, community and digital broadcasting services;
- The Triple Inquiry Report, including language obligations[1];
- The current licensed broadcasting services;
- The SABC radio language service expansion;
- Coverage and ERP requirements of broadcasters;
- Additional regional public broadcasting services licenses.

The Authority may consider re-categorisation of frequency assignments if it is in line with:

- Optimum use of the broadcast frequency spectrum;
- Technological changes in the broadcasting industry;
- Adapting to any other changing situations in the broadcasting industry.

The following procedure would be followed for the re-categorisation:

- Applications are to be completed with full justifications;
- Applications are to be gazetted for public comments within a defined time period;

[1] See page 8 of the Triple Inquiry Report 1995.

- In case of objections, the Authority may decide to hold public hearings before a final decision is made.

2.3 Contribution to the Diversity Requirements of the IBA Act

Section 2(a) of the Act promotes a diversity of services. The Terrestrial Broadcast Frequency Plan is aimed at contributing to diversity by amongst other things ensuring audiences have access to different categories of services on different technological platforms. There are some spare frequency assignments in the table which have been categorised but customised planning has not yet been completed and the plan therefore reflects the original provisions in the GE84/GE89/GE75 plans.

Television and Radio Self-Help stations will be limited to 50 Watts ERP[2]. Frequencies will be available for all categories of self-help stations.

2.4 Protection of National and Regional Identity, Character and Culture

The frequency plan attempts to give every citizen access to at least one broadcast frequency assignment for a service in his or her first language. In areas of greatest demands, such as Johannesburg, a greater number of frequency assignments are grouped together to address this need.

The roll out of digital terrestrial and satellite broadcasting would go a long way to help alleviate the shortage of frequency assignments in some geographic areas.

2.5 Protection of Existing Broadcasting Services

The Terrestrial Broadcast Frequency Plan does not deprive any existing licensed broadcaster of any frequency assignment. Future assignments though might necessitate some frequency changes to existing broadcasting

[2] See Position paper on self-help. (Self-help stations existing before the effective date of this position may have an ERP of more than 50W).

services. These changes will as far as possible be limited to stations that have a low ERP and a small coverage area [3]. Due to the reservations that have to be made particularly for digital audio broadcasting in VHF/TV channels 10 and 11, some assignments in the plan have been marked for change. The migration procedure would be dealt with in detail in the Digital Broadcasting Policy and Regulations.

2.6 Protection of the Integrity and Viability of the Public Broadcaster[4]

Section 2(d) of the Act advocates the protection of the integrity and viability of public broadcasting services. The Plan protects all operational PBS services and reserves additional frequency assignments for public broadcasting. These PBS frequency assignments are listed as Spare (SP) or Operational (OP) status. Television frequency assignments with a low ERP (less than 1 kilowatt) were not considered for co-ordination and are therefore marked as SPA or OPE. The Authority is in the process of coordinating all these frequency assignments.

2.7 Efficient Use of the National Broadcast Frequency Spectrum[5]

Section 2(k) of the Act provides for the promotion of the most efficient use of the broadcasting services frequency bands.

The Plan does not propose drastic changes to the existing frequency assignments. In comparison with the initial Draft Plan of 1995, the revised Plan adds a large number of FM and Television frequency assignments as required by the Act. The Plan is also in line with international planning principles and the software used to make additional assignments is based on ITU Recommendations.

It is also important to note that this plan differs drastically in the number of frequency assignments, from that provided in the ITU Regional African

[3] Frequency changes will be made in accordance with section 51(a) of the IBA Act 153 0f 1993.
[4] See also section 45(1) of the IBA Act 153 of 1993 on Public Broadcast Licences.
[5] See also section 31(1) of the IBA Act 153 of 1993

Frequency Assignment Plans for television (GE89) and for VHF/FM sound (GE84).

The GE84 FM plan contained 1011 frequency assignments while the Plan contains 1337 frequency assignments. The GE89 Television plan contained 739 frequency assignments while the Plan contains 1250 frequency assignments. These figures include all gap filler frequency assignments but exclude all self-help frequency assignments.

2.8 Fair Competition between Broadcasting Services

Section 2(o) of the Act mandates the Authority to ensure fair competition between broadcasting licensees. In order to fulfil this mandate, the plan allows, in most cases, for frequency assignments with similar coverage area (CML, PBS, PNS and PRS categories) in the same licence areas. This will allow for fair competition between different private broadcasters due to the equal potential listener- and viewer-ship from a transmitter site.

The responses for the expressions of interest for radio (community and commercial) were taken into account in developing the Plan. The Community frequency assignments vary in ERP from area to area, and sometimes in the same area, depending upon the coverage requirements for each Community.

2.9 Promotion of Stability in the Broadcasting Industry

The Authority has attempted to make frequency assignments available according to demand, need and population distribution. Further protection and recognition of our assignments are still being pursued with the ITU.

2.10 Promotion of Research into Broadcasting Policy and Technology

The Authority has actively supported the promotion of research into broadcasting policy and technology and has licensed test broadcasts for both

digital terrestrial audio broadcasting (T-DAB) (Eureka 147) as well as digital terrestrial television (DTT) (DVB-T).

Test transmissions have been conducted by Sentech at Johannesburg and Pretoria for T-DAB on 239.2 MHz and 1466.656 MHz as well as digital terrestrial television transmission in Johannesburg on channel 58.

Orbicom and MNET have also conducted test transmissions at Johannesburg, Kyalami and Helderkruin for DTT transmissions on channel 62.
At the end of each test period, test reports were submitted to the Authority.

The Authority through the previous Draft Frequency Plan discussion documents and various pilot projects has solicited a comprehensive view of Industry position on both T-DAB as well as DTT broadcasting.
The Authority is also paying close attention to the work of the ITU leading to the Regional Radiocommunication Conference (RRC) concerning the introduction of digital broadcasting in the VHF/UHF bands. The first conference was held in May 2004, and a second one will be held in 2005.

The following frequency allocations have been considered by the Authority for digital broadcasting use in South Africa:

- Frequencies below 30 MHz, to be used for digital AM;
- Band III channels 10 and 11 are seen as the band for the introduction of T-DAB services over a large coverage area (national and regional) Reservations have been made for this as indicated in the table of assignments;
- For smaller coverage area need, such as community radio broadcasting services and niche service networks, L-band is seen as the optimum solution;
- For digital terrestrial television (DTT) roll-out, the spare UHF frequency assignments are seen as the obvious choices. However, there are other analogue services demands on the existing spare capacity. These are the additional Public regional television services license, regional commercial

and local community broadcasting services. As current transmissions in the VHF channels 10 and 11 would have to give way to digital sound broadcasting, these would also have to be accommodated in the spare UHF assignments. The representations received from the public on the issue of analogue-digital platform prioritisation called for an urgent need for a migration plan. Whilst submissions in general agreed that the future of broadcasting would be digital, the overarching national policy on the introduction of digital terrestrial broadcasting and migration was not in place. The successful introduction of digital terrestrial television and the migration from analogue to digital will require a holistic approach and can not be considered only in the context of regional and local television.

An introduction and migration strategy for digital broadcasting hinges on the availability of spectrum and the Authority has decided to prioritise the allocation of frequencies for digital broadcasting in order to secure a migration path that would enable a smooth transition to digital. An overarching migration plan however, cannot be finalised without government policy directives.

The Authority has in the interim decided on the following to secure a migration path which is reflected in the table of assignments:

- The inevitable future introduction and migration to digital will be seriously hampered if the allocation of spectrum for digital is not prioritised.

- Spectrum reservation for digital should ensure that the current analogue services are accommodated and also provide for future expansions.

- Provision is to be made for two multiplexes (two analogue television frequency allocations) at each current transmission site (if available).

- The prevailing practice is that multiplexes accommodate 5 - 6 television services. Possible multiplex configurations are as shown in the table below.

Multiplex 1	SABC1	SABC2	SABC3	PRTV1	PRTV2	SPARE
Multiplex 2	etv	MNET	CSN	RCTY (local community)	RCML (Regional Commercial)	SPARE

- The network is to utilise single frequency network operation as far as possible and specifically in the metropolitan areas.

- The remaining analogue channels at each current transmission site, are to be allocated for public regional services if digital platform cannot be utilised.

- The remaining analogue assignments at the transmission sites will be re-categorised for commercial and community services to cater for e.tv analogue expansion, regional commercial and local television.

- It should be noted that the Authority is involved in the Planning and Technical Working Groups for the ITU Regional Radiocommunication Conference for the planning of terrestrial broadcasting in the VHF/UHF frequency bands (RRC-04/06), with the view of coming up with a Draft Plan for digital broadcasting.

- The draft plan will provide a comprehensive plan on digital broadcasting in the country, and therefore the proposals above will depend on the outcome of the Working Groups.

2.11 The Constitution

In terms of the Constitution, the Authority acknowledges equal right to frequency assignments and programme services.

2.12 Coverage Contours for Different Broadcasting Services

The Authority has specified service contour levels in section 3.7.1 of this document. These levels are in line with international standards and are used as the basis in determining the coverage area of a broadcasting service. The coverage area (defined as the area, in which the wanted field strength is equal to or greater than the usable field strength) is a function of all frequency assignments and associated specifications in the plan that will alter the coverage area, depending on the choice of the service contour.

2.13 Self- Help Stations

The Authority does not reserve frequencies for self-help stations due to the very low power used and the uncertainty of the requirement. Assignments are made as and when required. Therefore, the assignments listed in Annexure B and F are all operational. Self-Help frequencies should be proposed by the applicant.

2.14 Provincial (Regional) Broadcasting

The current plan assigns frequencies for the Public regional television services. These assignments are made on a secondary basis to the provisions made for future digital terrestrial broadcasting migration.

2.15 Annual Review of the Plan

Section 31(5) (a) states that the Authority shall annually review the Frequency Plan determined in terms of this section[6].

2.16 Data Accuracy and Community Radio Frequency Plans

The accuracy of the data in the Broadcast Frequency Plan is of a crucial nature. As a result, all comments on the accuracy and feasibility of the frequency assignments and associated parameters will be appreciated. Proposed corrections must have documentary support.

This plan reflects some corrections to the Community Radio Frequency Plans published in June 1997. The corrections were effected in the interest of orderly frequency management and will be taken into account when four-year community radio licences are issued. A significant number of frequencies have been assigned for community radio stations in this year's plan, increasing the number of frequencies available for community radio stations.

2.17 Procedures for the Review

- Publish a notice on the availability of the Draft Terrestrial Broadcast Frequency Plan and the request for representations in the Gazette[7];
- Consider the representations and/or comments received on the Draft Plan;
- Implement changes (if any), to the Draft Plan if the Authority deems it appropriate and necessary;
- Publish the Final Terrestrial Broadcast Frequency Plan; and
- Yearly revise the Terrestrial Broadcast Frequency Plan.

[6] See section 31(5)(a) of the IBA Act 153 of 1993

[7] See section 31(2) of the IBA Act regarding the publication of the draft plan.

3 The Frequency Planning and Assignment Process

3.1 Background

Section 31 of the Act (as amended) stipulates the following:

(1) "The Authority shall as soon as may be reasonably practicable after the commencement of this Act prepare a frequency plan whereby the maximum number of frequencies available for broadcasting services is determined".

(2) "In preparing a frequency plan in terms of this section, the Authority shall:

(a) have due regard to the reports of experts in the field of frequency planning and to internationally accepted methods for preparing such plans;

(b) take into account the existing frequencies used by broadcasting services; and

(c) reserve frequencies on all bands for the different categories of broadcasting licences referred to in section 40(1), and publish its draft plan by notice in the Gazette and in such notice invite interested parties to submit their written comments and representations to the Authority within such period as may be specified in such notice".

(3) "After due consideration of the comments and representations (if any) received pursuant to the notice referred to in subsection (2), the Authority shall determine the frequency plan and cause such plan to be published in the Gazette".

(4) (a)"Any frequency plan determined in terms of this section and all such comments and representations as have been received in response to the notice contemplated in subsection (3), shall be kept at the offices of the Authority and be available for

inspection by members of the public during the normal office hours of the Authority".

(b) The Authority shall at the request of any person and on payment of such fee as may be prescribed (if any), furnish him or her with a certified copy of or extract from any part of the documentation contemplated in paragraph (a)".

(5) (a) "The Authority shall annually review a frequency plan determined in terms of this section.

(b)The provisions of subsections (2), (3) and (4) shall mutatis mutandis apply in relation to any amendment contemplated in paragraph (a) of this subsection".

The SABC/Sentech in consultation with the former Postmaster General drafted the original broadcasting frequency plans for Medium Wave, VHF/FM and VHF/UHF/Television for South Africa. All these plans, except the Medium Wave plan, were internationally co-ordinated and accepted by the International Telecommunication Union (ITU) as being fully in compliance with its regulations.

After the establishment of the IBA in 1994, these frequency plans were amended and incorporated into an Interim Frequency Plan, based on which the Authority issued almost 100 new temporary community-broadcasting licences. This Interim Frequency Plan was further amended to comply with the recommendations of the then IBA's "Report on The Protection and Viability of Public Broadcasting Services; Cross Media Control of Broadcasting Services; Local Television Content and South African Music" (referred to as the "Triple Inquiry Report", August 1995). Using an assignment method of [8]foremost priority, further assignments were made to cater for the needs of Community Sound Broadcasters, and frequency assignments in the Plan were categorised as Community, Public, and Commercial. The resultant frequency plan was published as a draft in the Government Gazette for comment during October 1995. It was again amended, first published as a draft and then as a

[8] The method of foremost priority is defined as choosing the most suitable and minimum interference frequency for assignment at a specific coordinate or location.

final plan in 1999. Subsequently, the plan was revised and updated and finally published in July 2002.

The Frequency Plan in this document contains all the foregoing and the amendments and additional assignments referred to elsewhere in this document. The breakdown of the current plan is as shown in Table 1.

BROADCASTING SERVICE CATEGORY	**MW**	**FM**	**SELF-HELP**	**TOTAL**
Analogue Sound				
• Commercial	• 19	• 214	• 1	• 234
• Community	• 19	• 352	• 0	• 371
• Public	• 15	• 778	• 37	• 830
• **TOTAL**	• 53	• 1337	• 38	• 1442
Analogue Television	**VHF/UHF**		**SELF-HELP**	
• Commercial	• 297		• 125	• 422
• Community	• 34		• 0	• 34
• Public National	• 466		• 490	• 956
• Public Regional	• 106		• 0	• 106
• **TOTAL**	• 903		• 615	• 1518*
Digital Broadcasting				
• **DTT**	• 342			
• **DAB**	• 5			

Table 1: The Breakdown of the Frequency Plan as per Category

* Most spare TV frequency assignments in the main network are used for self-help relay services and the total may mean double counting.

During the time that the Authority has been issuing temporary community sound broadcasting licences, various geographic areas have been identified in which a shortage of frequency assignments exists. A Community Radio Frequency Plan, using an assignment method of foremost priority has been compiled on a province-by-province basis. This plan contains all FM and MF

frequency assignments that are available for community broadcasting in all nine provinces. Frequency assignments occupied by the current community broadcasters are not specified separately as new applicants can also apply for these.

The plan was aimed at providing the maximum number of frequency assignments at the lowest possible interference levels. Technical limitations and population figures were used as a guide.

The provincial community radio frequency plan is as shown in annexure D. The Provincial frequency plans do not distinguish between frequency assignments for community of interest and geographical communities. The Provincial frequency plans include MF frequency assignments that can only be used in specified areas. The frequencies are all above 1269 kHz and have a maximum EMRP of 1 kilowatt. The Authority will not consider an increase in the EMRP above 1 kilowatt for any of these frequency assignments. Due to frequency re-use, the night-time coverage may be somewhat reduced due to interference from sky wave signals of stations operating on the same frequency. The Authority will only protect the 24-hour service contour from interference.

3.2 Purposes of a Frequency Plan

A frequency plan has several purposes:

- It gives direction in the broadcasting industry;
- It allows the Authority to determine a broad strategic view on how it will distribute frequencies across the country;
- It sets out the basis upon which licences can be granted, and puts in the public domain information about the total number and mix of licences that can be considered at a particular point in time;

- It gives status to planned assignments so that they can be entered into the master frequency register to be taken into account in all future planning and potential interference assessments. This is to prevent other assignments or changes being made either by the Authority or our neighbouring administrations, which might make the reserved frequency unsuitable for use;
- A frequency plan must be demand and policy driven, and not technology driven. Broadcasting policy formulation should not in general be required to work around what might be an ideal engineering solution; and

- To ensure South African Broadcasting is globally competitive.

The frequency plan is thus a significant policy document, with extensive engineering input in order for it to be reliable and to ensure stability in a growing broadcasting industry.

The frequency plans for FM sound and television broadcasting have been developed on the basis of providing essentially the full range of services to the majority of the population.

3.3 Compliance with Internationally Accepted Methods

As a requirement of section 29 of the Act, the frequency plans are based on internationally accepted practices and the levels of spectrum usage are consistent with international practice. The same basic planning assumptions providing substantially low interference service within the intended service area were used.

The broadcasting frequency bands are pre-planned and internationally co-ordinated through the ITU to avoid mutually harmful interference between neighbouring countries. These bands are the Medium Wave (MW or MF), and VHF/FM bands for sound broadcasting and the VHF and UHF bands for television broadcasting. To allow for technological advances and to

accommodate changing priorities of countries, the international plans are reviewed every 20 to 30 years. Provision is also made for modifications to the plans. Procedures are laid down by which frequency assignments can be modified or added to the existing plans. Affected countries have to be consulted and the ITU has to be notified of all such modifications or additions. The current international frequency assignment plans, which are included in Regional Agreements established by the ITU and adopted by the involved countries, are the following:

- Medium Wave Sound Broadcasting: Geneva Plan of 1975 for Africa, Europe and Asia between 535,5 kHz and 1606,5 kHz.

- VHF/FM Sound Broadcasting: Geneva Plan of 1984 for Africa and Europe between 87, 5 MHz and l08 MHz.

- VHF and UHF Television: Geneva Plan of 1989 for Africa and neighbouring countries between 174 MHz to 254 MHz and 470 MHz to 854 MHz.

Any frequency plan must comply, not only with the criteria established by the ITU for preparing such plans, but specifically comply with the above mentioned Regional Agreements and the conventions, regulations and provisions of the ITU to which South Africa is a party. These are contained in the international treaties established by the ITU, adopted by the member countries and are legally binding in being recognised by the Act in the Republic of South Africa as provided for in section 29(2) of the Act.

3.4 Broadcasting Frequency Bands Included in the Frequency Plan and its Usage in South Africa

The following broadcasting frequency bands are included in the Frequency Plan.

- AM-MF(MW) Sound Broadcasting 535,5 - 1606,5 KHz
- VHF/FM Sound Broadcasting 87,5 - 108 MHz
- VHF Television Broadcasting 174- 238 MHz; 246 - 254 MHz
- UHF Television Broadcasting 470 - 854 MHz

The HF broadcasting bands are coordinated by the ITU. The procedures are laid down in Article 12 of the Radio Regulations (RR12-1) and subsequent planning documents released by the Radio Communication Bureau. The procedure is based on the principle of equal rights of all countries to equitable access to these bands. As transmissions in the tropical Bands are intended for national coverage, the transmitter output power is restricted to 50 kW. Table 2 indicates the various allocations to the HF frequency spectrum sound broadcasting services available to South Africa.

High Frequency (HF) Sound Broadcasting:

HF (kHz)	
3900 – 4000	13600 – 13800
5950 – 6200	15100 – 15600
7100 – 7300	17550 – 17900
9500 – 9900	21250 – 21850
11650 – 12050	25670 – 26100
HF Tropical Band (kHz)	
2300 – 2498	3200 – 3400
4750 – 4995	5005 – 5060
HF single side band (kHz)	
5900 – 7300	13570 –13600
7300 – 7350	13800 – 13870
9400 – 9500	15600 – 15800
11600 – 11650	17480 – 17550
12050 – 12100	18900 – 19020

Table 2: HF Broadcasting Frequency Bands Accessible to SA

3.4.1 MF-AM Broadcasting Band

The MF AM broadcasting band lies between 530 and 1606,5 kHz, and is divided into 120 channels of 9 kHz bandwidth each. In South Africa, the first channel on 531 kHz is not used for MF broadcasting as the frequency band 526.5 – 535.5 kHz is allocated to mobile telecommunications service. Three of the MF channels have been designated as low power channels where the power may not exceed 1 kW. Currently medium to high power MF-AM transmitting sites are located at Meyerton, springs, Roodepoort, Komga, Ga-Rankuwa and Klipheuwel. The local authority and environmental considerations often limit the establishment of high power MF stations due to the large infrastructure associated with such stations and its interference impact on electronic systems.

South Africa has 37 channels registered with the ITU; of these 11 are in use with powers between 10 kW and 100 kW. At the ITU Geneva '75 Conference for MF-AM planning, it was resolved in the Final Acts that the provisions and resolutions adopted for the benefit of member and non-member states shall not be applied to the Government of the Republic of South Africa. The current MF-AM plan for South Africa therefore does not have any protection in terms of the ITU Plan. It is provided for in the Authority's three-year work plan to seek protection in the ITU Final Acts GE 75 for the South African plan. The plan can then be amended to suite our local needs.

The South African MF-AM plan includes low power frequencies assigned to Community Radio services. Low power for MW applies to 1 kW or lower powers. The ITU planning principles allow for the addition of low power frequency assignment with a simplified coordination procedure.

3.4.2 VHF-FM Sound Broadcasting Band

In the VHF FM sound-broadcasting band between 87,5 MHz and 108 MHz there are 204 channels, each of 100 kHz bandwidth. These are grouped into 31 groups of 6 channels, plus additional 18 channels. The groups are distributed in a uniform lattice where each node point relates to a transmitting area. This means that at any one transmitting site in an area the ITU plan

provides for 6 channels or frequencies to be available for assignment. In areas of greatest demand, 12 channels were assigned to one area by combining 2 lattice node points. In order to provide national FM coverage it was necessary to locate high power transmitting stations approximately 110 km apart. Although such a transmitting station may only have coverage radius of 30 - 50 km, interference from such a station can occur over hundreds of kilometres. In order to avoid mutual interference between stations operating on the same frequency, it is necessary for the signal from the wanted station to be between 37 dB and 45 dB higher (i.e. 5 000 and 30 000 times stronger) than the interfering signal. Hence a high power FM frequency assignment can only be reused at a distance of close to 500 km. On the other hand, low power (e.g. 1 watt) FM transmitters using the same frequency can be situated some 10 km apart (depending on the terrain and broadcasting antenna characteristics and site height) due to its limited area of coverage and interference impact.

Due to constraints in receiver design, an average domestic FM radio receiver cannot discriminate between frequencies less than three channels apart. This places a further limitation on the number of VHF/FM frequencies available for assignment in an area.

3.4.3 VHF TV Broadcasting Band

The VHF television broadcasting band is between 174 MHz and 238 MHz and between 246 and 254 MHz. It contains only 9 channels of 8 MHz bandwidth each, so a uniform lattice with multiple channels (3) at each node cannot be formed and used to assign frequencies on a national basis. These channels have been assigned in groups of 3 only to metropolitan areas and, where possible, also to rural areas, using a method of foremost priority.

In the past, there has been a prohibition of adding a NICAM (Near Instantaneously Compounded Audio Multiplex) carrier for digital stereo sound to TV channel 13 (246 – 254 MHz) due to its interference to the public trunked mobile radio communication services located at 254 MHz and higher. The

problem is made more noticeable by the fact that channel 13 is used with a slightly offset vision carrier of 247.43 MHz rather than the standard 247.25 MHz. This was originally done to avoid interference from the residual vestigial colour sub-carrier to the international distress frequency on 243 MHz. Modern television transmitters no longer produce any significant residual vestigial colour sub-carrier. A technical solution has been found to the interference problem to mobile truncking services. The solution is to move the vision frequency by 300 kHz down to 247.13 MHz and to apply the narrower PAL-B/G "roll-off" filtering instead of the wider PAL-I version. This solution has been tested and all concerned parties have accepted the results. The Authority's Council has approved the introduction of NICAM in channel 13 as described above. No feedback on the implementation has yet been received from television broadcasters and signal distributors.

3.4.4 UHF TV Broadcasting Band

The UHF television broadcasting band between 470 MHz and 854 MHz contains 48 channels, each of 8 MHz bandwidth, arranged into 12 groups of 4 channels. This means that 4 channels are available for assignment at any one transmitting site on a national basis. In areas of greatest demand, 7 to 11 channels have been assigned, once again by combining lattice node points or where both VHF and UHF channels have been assigned to a particular area.

In terms of SABRE 1(South African Band Replanning Exercise), the band 470 to 854 MHz is exclusively allocated to television broadcasting services[9] and is extensively being used for analogue television broadcasting at the present time. SABRE 1 noted that if sharing with telecommunication services is required in this band, a further study would have to be carried out to determine feasibility, the sharing criteria and appropriate protection ratios.

The Authority is currently conducting a public process on the need for the sharing study and whether it is economically and technically justified and

[9] See GG17983 of 6 May, 1997 " Revision of the South African Frequency …"

significant enough to warrant a full scale feasibility study and field tests to establish sharing criteria.

The outcome of the TRASA/ITU sharing study was included in the discussion document issued by the Authority in its public process on 800 MHz sharing study[10].

The outcome of the public process would be made available to all interested parties.

3.4.5 Broadcasting Frequency Planning Principles

South Africa, as a signatory to the ITU Convention, and more particularly having acceded to the Regional Agreements concerning VHF-FM Sound broadcasting and VHF/UHF television broadcasting, is obliged to adhere to the planning principles agreed to in the planning conferences organised by the ITU to plan the broadcasting frequency bands.

The existing frequency plans for FM and TV have been developed on the basis of providing essentially a full range of public broadcasting services to the majority of the population. The South African frequency plans currently in use are based on internationally accepted practices similar to those adopted in Europe, Australia and Asia. The current levels of spectrum usage in South Africa are also consistent with international practice.

Frequencies are normally assigned to transmitting stations according to a uniform lattice in case of the VHF/FM and UHF television frequency bands. Frequencies are reused at a distance where there will be no harmful interference between transmitting stations operating on the same frequency or on adjacent frequencies. Techniques are used to increase frequency usage density, such as orthogonal polarisation and frequency off-set.

[10] see GG1269 of 12 July 2002

3.5 Interference as a Limiting Factor to Frequency Assignment

Issues that are important in frequency planning include definition of the area to be served by each broadcasting station, whether these areas may be or need to be served through the use of multiple frequencies or whether it is to be served by a single transmitter, and decisions about how much interference between services is tolerable, and the grade of service to be provided to the listeners or viewers within the area to be served. In the final instance, a frequency plan can consist of a number of combinations and permutations of frequencies and power levels for the same area, all of which may be technically acceptable. Also, it would be possible to have a smaller number of high power transmitters, or a larger number of low power transmitters, or any combination between these extremes, in any particular geographic area, dependent on the particular needs, and considering the topography in the area.

While it would be possible to avoid interference between broadcasters or transmitters by never using a frequency more than once nor using frequencies close to each other, this is unrealistic because very few services could be established in this scenario. Frequency re-use is therefore a standard feature of all frequency plans and is the essence of the efficient use of the frequency spectrum.

The plan attempts to manage the problem of interference and accommodate the maximum number of frequency assignments within a given area for a given amount of spectrum. The plan also takes account of the practical limits of coverage of stations imposed by factors such as the physics of radio wave propagation, limits of radiated power from the stations, and performance characteristics (selectivity and sensitivity) of typical receivers.

The engineering considerations of interference prediction and coverage assessment usually follow recommendations of the ITU. These recommendations draw on the pooled knowledge of experts world-wide, which is expressed in terms of guidelines, standards and parameters that have been

established as providing proven practical and realistic results. The Authority therefore has to establish a policy of defining licence areas to be served, and to plan accordingly. Interference or signal strength complaints about reception from listeners or viewers outside of the licence area of the station are normally not considered.
This is generally known as interference limited approach in assigning frequencies and determining the coverage area of a particular broadcasting station, as opposed to a noise limited approach (where the signal level is allowed to drop to below the ambient noise level). The latter is considered to be inefficient in the use of the frequency spectrum.

Due to current spectrum utilisation in some areas, particularly in the VHF/FM band, it has in certain cases been possible to receive broadcast transmissions in areas beyond the intended target area of transmitting stations, as broadcasts have been mostly noise limited. As more frequency assignments are made and new broadcasters come on the air, services will no longer be noise limited but will become interference limited. This means that although the prime target area of the transmitting station will continue to receive satisfactory coverage, people in areas outside the target area who in the past were able to receive transmissions, will no longer be able to do so due to increased spectrum usage and the consequent increase in interference levels.

Some broadcasting signal distributors are making use of re-broadcasting techniques (RBR) to provide programme feeds to transmitting stations. In this process a signal is received from an adjacent transmitting station and re-transmitted to the intended target area. The Authority did not use any criteria to protect such links from any interference in the compilation of this plan. When necessary, more use will have to be made of either telecommunications links or satellite facilities to provide programme feeds to transmitting stations where interference on RBR has become a problem.

In drawing up the Frequency Plan, priority was given to maximising the number of broadcasting frequencies available for assignment to broadcast services. Consequently, no protection against harmful interference can be

given to radio frequency output signals on home equipment such as video cassette recorders (VCR's), satellite receivers, integrated receiver decoders (IRD's) etc. operating in the broadcasting services frequency bands.

In countries with a tradition of public broadcasting, systematic planning methods have been applied on the basis that public services should be widely accessible to all of the population. This planned approach is the one adopted by the ITU generally and in particular for planning of broadcasting services in Africa. This is the approach that has been used for broadcasting frequency planning in South Africa, and which the Authority intends to continue applying (in compliance with ITU methods).

The Frequency Plan is to be treated as a living document and a vehicle to assist the Authority to facilitate the development of a broadcasting system which is responsive to the changing technical and social environment, and which will enable the Authority to achieve the primary objects of section 2 of the IBA Act. The Authority will at all times keep the latest frequency plan on its website (www.icasa.org.za) for easy access by the public.

3.6 Factors Restricting the Frequency Plan

A number of factors place restrictions on the Frequency Plan, being:

- frequencies occupied by existing broadcasters;
- the need to co-ordinate broadcasting frequencies with South Africa's neighbours;
- demographic and topographic conditions.

Although broadcasters operating services before the promulgation of the IBA Act, are guaranteed continued use of their frequency assignments as a result of the so-called "grandfather" clauses of the IBA Act, section 52 of the Act gives the Authority to amend the conditions of a broadcasting licence as determined in Section 51(1) of the IBA Act, as follows:

(a) " to such extent as may be necessary in the interest of orderly frequency management, provided the amendment will not cause substantial prejudice to the licensee; or"

(b) "to such extent as may be necessitated by virtue of any bilateral, multilateral or international agreement or convention relating to broadcasting to which the Republic is bound, whether as a party or otherwise".

Furthermore, international agreements and ITU Radio Regulations require that all medium and high power frequency assignments are co-ordinated with neighbouring territories so as not to cause trans-border interference. This requires that any addition of a new frequency or relocation of a frequency of a medium or high power broadcasting station situated within approximately 400 km from the border of any of South Africa's neighbours (Namibia, Botswana, Zimbabwe, Swaziland, Mozambique or Lesotho) would require extensive bilateral negotiations.

3.7 Coverage Area and Service Contour Levels

ITU provides the following definitions:

- Coverage Area[11]

The coverage area is defined by the ITU as the area within which the field strength of a wanted transmitter is equal to or greater than the usable field strength.

IBA Act provides the following definition:

- Licence Area[12]

The licence area is defined in the IBA Act and it reads as follows: “the geographical target area of a broadcasting service as specified in the relevant broadcasting licence”. If a licence area is not specified in a broadcasting service licence, then the technical parameters specified in the licence conditions will be used in the licence area calculations.

[11] See Final Acts GE 89
[12] See IBA Act 153 of 1993 (Definitions)

The determination of a coverage area is governed by the following definitions of ITU:

- "The area within which the field strength of the wanted transmitter is equal to or greater than the usable field strength. In this area the protection against interference is provided for 99% of the time."
- "Usable field strength is the minimum value necessary to guarantee satisfactory service quality for at least 99% of the time and in at least 50% of the locations, in the presence of natural and man-made noise and *in the presence of interference* from other transmitters."
- "Minimum usable field strength is the minimum value necessary to guarantee satisfactory service quality in the presence of natural and man-made noise but *in the absence of interference* from other transmitters."

3.7.1 Minimum Usable Field Strength

The minimum usable field strength values to be used to calculate coverage, using the associated technical parameters, are referred to as the service contour values and are specified in Table 4.

	All Areas
MF	• **74 dBµV/m**
FM • **Monophonic** • **Stereophonic**	• **60 dBµV/m** • **66 dBµV/m**
TV • **VHF(Band III)** • **UHF(Band IV)** • **UHF(Band V)**	• **55 dBµV/m** • **65 dBµV/m** • **70 dBµV/m**

Table 4: Service Contour Values used as the basis in Determination of Coverage Area

3.7.2 Usable Coverage Area (Usable Field Strength)

The coverage can be calculated for each frequency, using the associated technical parameters, determining the effect of interfering transmitters and using the service contour values as defined in section 3.7.1.

The coverage calculation is based on a data terrain model and a specific prediction model. The prediction model must be applicable to the frequency band of operation. All interference from other transmitting stations must be taken into consideration whenever this calculation is performed. This calculation produces the usable (interference limited) service area.

The usable coverage area, as described in this section, must be used as the basis for all demographic calculations such as percentage population coverage figures.

4 Broadcasting frequency assignments in the Republic of South Africa

4.1 Sound Broadcasting Services

This subsection covers the frequency assignments for the sound-broadcasting services as defined by the ITU, for the categories used in the RSA, viz. VHF/FM and MF/AM. The description of the categories, their frequency assignment tables and relevant definitions are given in the subsections to follow.

4.1.1 VHF/FM

The frequency assignments and associated information referred to in this subsection are given in Annexure A and relate to the frequency plan as defined in the ITU Geneva Plan of 1984 (GE84).

All VHF/FM sound transmissions are included. VHF/FM transmissions are those, which make use of frequency modulation and which operate in the band 87.5 to 108.0 MHz.

GE84 normally provides for six frequency assignments per transmitting site or area. At certain transmitting sites or areas, seven or more frequencies have been assigned. This has been made possible by assigning so-called additional channels or by assigning more than one lattice node point. There are a total of 204 frequency assignments available in the FM frequency band.

4.1.2 MF/AM

The frequency assignments and associated information referred to in this section are given in Annexure C and relate to the frequency band from 535,5 to 1606,5 kHz. Although the Republic of South Africa is not a signatory to the

plan of ITU Geneva Plan of 1975(GE75), the frequency regulatory authority has always abided by the technical provisions laid down in the plan.

All medium-frequency amplitude modulation (MF/AM) type transmissions that exist in the Republic of South Africa are included. Frequencies assigned to theoretical stations and which are available for future use are also included.

4.1.3 Technical Standards and Transmission Characteristics Applicable to Sound Broadcasting Services

4.1.3.1 Channel Numbering in Band II

A		B		C		D		E		F	
1	87.6	32	90.7	64	93.9	97	97.2	132	100.7	168	104.3
2	87.7	33	90.8	65	94.0	98	97.3	133	100.8	169	104.4
3	87.8	34	90.9	66	94.1	99	97.4	134	100.9	170	104.5
4	87.9	35	91.0	67	94.2	100	97.5	135	101.0	171	104.6
5	88.0	36	91.1	68	94.3	101	97.6	136	101.1	172	104.7
6	88.1	37	91.2	69	94.4	102	97.7	137	101.2	173	104.8
7	88.2	38	91.3	70	94.5	103	97.8	138	101.3	174	104.9
8	88.3	39	91.4	71	94.6	104	97.9	139	101.4	175	105.0
9	88.4	40	91.5	72	94.7	105	98.0	140	101.5	176	105.1
10	88.5	41	91.6	73	94.8	106	98.1	141	101.6	177	105.2
11	88.6	42	91.7	74	94.9	107	98.2	142	101.7	178	105.3
12	88.7	43	91.8	75	95.0	108	98.3	143	101.8	179	105.4
13	88.8	44	91.9	76	95.1	109	98.4	144	101.9	180	105.5
14	88.9	45	92.0	77	95.2	110	98.5	145	102.0	181	105.6
15	89.0	46	92.1	78	95.3	111	98.6	146	102.1	182	105.7
16	89.1	47	92.2	79	95.4	112	98.7	147	102.2	183	105.8
17	89.2	48	92.3	80	95.5	113	98.8	148	102.3	184	105.9
18	89.3	49	92.4	81	95.6	114	98.9	149	102.4	185	106.0
19	89.4	50	92.5	82	95.7	115	99.0	150	102.5	186	106.1
20	89.5	51	92.6	83	95.8	116	99.1	151	102.6	187	106.2
21	89.6	52	92.7	84	95.9	117	99.2	152	102.7	188	106.3
22	89.7	53	92.8	85	96.0	118	99.3	153	102.8	189	106.4
23	89.8	54	92.9	86	96.1	119	99.4	154	102.9	190	106.5
24	89.9	55	93.0	87	96.2	120	99.5	155	103.0	191	106.6
25	90.0	56	93.1	88	96.3	121	99.6	156	103.1	192	106.7
26	90.1	57	93.2	89	96.4	122	99.7	157	103.2	193	106.8
27	90.2	58	93.3	90	96.5	123	99.8	158	103.3	194	106.9
28	90.3	59	93.4	91	96.6	124	99.9	159	103.4	195	107.0
29	90.4	60	93.5	92	96.7	125	100.0	160	103.5	196	107.1
30	90.5	61	93.6	93	96.8	126	100.1	161	103.6	197	107.2
31	90.6	62	93.7	94	96.9	127	100.2	162	103.7	198	107.3

Additional channels:

63	93.8	95	97.0	96	97.1	128	100.3	129	100.4	130	100.5
130	100.6	163	103.8	164	103.9	165	104.0	166	104.1	164	104.2
199	107.4	200	107.5	201	107.6	202	107.7	203	107.8	204	107.9

Table 5: Channel Numbering in Band II

4.1.3.2 Frequency Tolerances

Frequency tolerance is the maximum permissible departure from the specified carrier frequency by the actual frequency of the transmitted signal.

Transmitter frequency tolerance shall be as set out in the table below:

Frequency Band	Tolerance
535.5 kHz to 1606.5 kHz	±10 Hz
1606.5 kHz to 29.7 MHz	±10 Hz
87.5 MHz to 108 MHz	±2000 Hz

Table 6: Frequency Tolerances for Sound Broadcasting

4.1.3.3 Spurious Emission Power Levels

This is an emission on a frequency or frequencies outside the necessary bandwidth and which may be reduced without affecting the corresponding transmission of information. Spurious emission includes harmonic emission, parasitic emissions, intermodulation products and frequency conversion products but exclude out of band emissions. The maximum permitted levels of spurious emissions, in terms of the mean power level of any spurious component supplied by a transmitter to the antenna transmission line shall be as set out in table below:

Frequency Band	Spurious Emission Level
535.5 kHz to 1606.5 kHz	40 dB/50 mW
87.5 MHz to 108 MHz Transmitter output power > 25 W Transmitter output power < 25 W	 60 dB/1 mW 40 dB/25 μW

Table 7: Spurious Emission Limits for Sound Broadcasting

4.1.3.4 Transmission System

The following maximum VHF/FM carrier frequency deviations caused by frequency modulation will be allowed:

- In respect of monophonic systems: 75 kHz

- In respect of stereophonic systems: 75 kHz

4.2 Television Broadcasting Services

This section covers the frequency assignments for the television broadcasting service as defined by the ITU. It covers the VHF and UHF bands.

The VHF band allocated to the RSA ranges from 174.0 to 254.0 MHz, excluding the portion from 238 to 246 MHz, and is sometimes referred to as VHF Band III. It is to be noted that the allocation for the RSA and the neighbouring states Botswana, Mozambique, Malawi, Namibia, Zimbabwe, Lesotho, Swaziland and Zambia extends to a higher frequency than the normal allocation for Region 1.

The UHF band ranges from 470.0 to 862.0 MHz. The allocation agrees with UHF Band IV and UHF Band V allocated to ITU Region 1. In the RSA, the band for television broadcasting only extends as far as 854 MHz. Above this, assignments have been made available to telecommunication services.

Frequency assignments and associated information contained in this subsection are given in Annexure E. They relate to the frequency plan as defined in the ITU plan for television broadcasting in mainly the African area, contained in ITU Geneva1989 Plan (GE89).

Frequencies assigned to TV low power stations are invariably in the UHF band. Orthogonal polarisation, relative to that of high power stations, is used in order to increase frequency usage as a result of reduced interference levels with orthogonal polarisation. Orthogonal polarisation and frequency offset is also used between high power transmissions to decrease interference experienced and increase frequency use.

4.2.1 Technical Standards and Transmission Characteristics Applicable to Television Broadcasting Services

4.2.1.1 Channel Numbering in Band III (174 – 238MHz and 246 – 254MHz)

Channel No.	Channel Limits (MHz)	Vision Carrier Frequency (MHz)
4	174 – 182	175.25
5	182 – 190	183.25
6	190 – 198	191.25
7	198 – 206	199.25
8	206 – 214	207.25
9	214 – 222	215.25
10	222 – 230	223.25
11	230 – 238	231.25
13	246 – 254	247.13[13]

Table 8: Channel Numbering in Band III

[13] Refer to Section 3.4.3 for explanation to the non-standard vision carrier frequency of channel 13.

4.2.1.2 Channel Numbering in Band IV/V (470 – 854MHz)

Channel No.	Channel Limits (MHz)	Vision Carrier Frequency (MHz)
21	470 – 478	471.25
22	478 - 486	479.25
23	486 – 494	487.25
24	494 – 502	495.25
25	502 – 510	503.25
26	510 – 518	511.12
27	518 – 526	519.25
28	526 – 534	527.25
29	534 – 542	535.25
30	542 – 550	543.25
31	550 – 558	551.25
32	558 – 566	559.25
33	566 – 574	567.25
34	574 – 582	575.25
35	582 – 590	583.25
36	590 – 598	591.25
37	598 – 606	599.25
38	606 – 614	607.25
39	616 – 622	615.25
40	622 – 630	623.25
41	630 – 638	631.25
42	638 – 646	639.25
43	646 – 654	647.25
44	654 – 662	655.25
45	662 – 670	663.25
46	670 – 678	671.25
47	678 – 686	679.25
48	686 – 694	687.25
49	694 – 702	695.25

Channel No.	Channel Limits (MHz)	Vision Carrier Frequency (MHz)
50	702 – 710	703.25
51	710 – 718	711.25
52	718 – 726	719.25
53	726 – 734	727.25
54	734 – 742	735.25
55	742 – 750	743.25
56	750 – 758	751.25
57	758 – 766	759.25
58	766 – 774	767.25
59	774 – 782	775.25
60	782 – 790	783.25
61	790 – 798	791.25
62	798 – 806	799.25
63	806 – 814	807.25
64	814 – 822	815.25
65	822 – 830	823.25
66	830 – 838	831.25
67	838 – 846	839.25
68	846 – 854	847.25

Table 9: Channel Numbering in Band IV/V

4.2.1.3 Frequency Tolerances

For both VHF and UHF TV bands, the tolerance shall be 500 Hz

4.2.1.4 Spurious Emission Power Levels

Frequency band	Spurious Emission Level
174 – 254 MHz and 470 – 854 MHz • Tx o/p > 25 W • Tx o/p < 25 W	 • 60 dB/1 mW • 40 dB/25 μW

Table 10: Spurious Emission Power Levels for Television Broadcasting

4.3 Terrestrial Self- Help Stations Assignments

Self-help broadcasting relay transmitting stations are transmitting stations established, owned and operated by entities such as municipalities, farmers associations, business organisations and individuals. The purpose of a self-help station is to relay a programme service to an area where the programme service cannot easily be received through the regular transmissions, i.e. where the coverage is insufficient. Self-help broadcasting relay transmitting stations are extensions of the broadcaster's network and have been operating under the broadcaster's licence. The broadcasters involved are the SABC, e-tv and M-Net.

Self-help relay transmitting stations are used for both sound and television broadcasting. It is envisaged that the need for self-help stations will continue, even with the availability of KU-band satellite transmission. The purpose of self-help stations will probably shift from providing coverage in areas where coverage from terrestrial stations is lacking to facilitating lower-cost communal reception.

4.3.1 Sound Broadcasting (VHF/FM)

This section covers self-help stations that relay VHF/FM sound-broadcasting programme service. They operate in the regular VHF/FM band, i.e. between 87.5 and 108.0 MHz. (There are no stations that relay MF/AM broadcasting services.) The frequency of the regular transmission of the broadcasting service is usually translated to another frequency in the band before it is broadcasted by the self-help station.

Frequency assignments in this category are given in Annexure B.

4.3.2 Television Broadcasting

Self-help stations in this section are used for both VHF and UHF television broadcasting. The relay station may operate in the UHF band if the main transmitting station operates in the VHF band and vice versa. However, the relay station only operates in the VHF band in special cases. Frequency assignments in this category are given in Annexure F.

4.4 Generic definition of terms used in the table of assignments

Station name

The station name is the internationally co-ordinated name of the transmitting station or area location. The name was decided upon using the following guidelines:

- In cases where the site is located in or near a city, major town or suburb, the respective name is used.
- In cases where it is not located near a city or town the name of a relevant hill, mountain or other well-known geographical feature is used.
- In some cases, a station name has been used but the station does not yet exist, neither is there any development at the site. The station name in those cases is a provisional name that is associated with a theoretical lattice node point.

Latitude and Longitude

This is the nominal co-ordinates of the station in degrees, minutes and seconds, south and east. In those cases where a site has not yet been developed i.e. where the frequency is assigned to a theoretical lattice point, the co-ordinates are those of the theoretical point.

Channel No. (Chan.)

Channel numbering is applicable to only Television frequency assignments. This is the number of the frequency channel, according to the ITU designation.

Frequency (Freq.)

For VHF/FM assignments, this is specified in megahertz (MHz). In the case of MF/AM, it is specified in kilohertz (kHz).

Vision frequency (Freq.)

Vision frequency is applicable to Television assignments. It is the frequency of the vision carrier in megahertz (MHz): The sound-carrier frequency is not given. It is 6 MHz above the vision carrier in all cases.

Offset

Offset is also applicable to only Television frequency assignments. It is the frequency offset from the nominal frequency given in the assignment plan to reduce co-channel interference. The offset may be positive (P), i.e. the frequency is greater than the nominal frequency or negative (N), and i.e. the frequency is less than the nominal frequency. The letters P or N are preceded by the offset in twelfths of the line frequency (e.g. 20P means that the frequency is 20/12 x 15.625 kHz above the nominal frequency).

In the majority of cases of self-help relay stations, because of the low ERP employed and the type of equipment used, there is a lesser strict frequency tolerance than in the main and the gapfiller stations. This precludes the use of offset in these assignments.

ERP

This is applicable to VHF/FM and Television frequency assignments. ERP is the maximum effective radiated power. In the case of an omni-directional antenna it is the maximum effective radiated power in any direction. In the case of a directional antenna it is the effective radiated power in the direction of maximum gain. The ERP is specified in kilowatts (kW) and is sometimes rounded off to the nearest integer.

EMRP

This is the effective monopole radiated power applicable to MF/AM assignments. This is the power supplied to the antenna, multiplied by the antenna gain referred to that of a short vertical antenna in the horizontal plane.

Polarisation (Pol.)

This column indicates the dominant polarisation mode of the transmitting antenna, while transmission in the other mode is minimal, unless slant or circular polarisation is specified. The dominant polarisation is normally either horizontal (H) or vertical (V).

Programme Service (programme)

This is the name of the programme service carried by the transmission.

On-air Date

This is the date on which the transmitter went on the air. Where the date is omitted, the frequency is either available for future use at the station site or available for re-assignment to a site in the vicinity of the theoretical lattice point in the GE84 (See definition of “Status”) or the broadcaster has not supplied the Authority with this information.

Status[14]

The Status column indicates which frequency assignments are:

- Operational - In which case the status is indicated as OPE or OP;
- Spare - in which case the Status is indicated as SPA or SP. A frequency with SPA or SP status is either assigned to an already developed site, or a theoretical lattice node point;
- Licensed - in which case, the Status is indicated as LIC or LI. This frequency status means that it has been assigned to a broadcasting licensee by the Authority but that the technical parameters have not yet been finalised or the broadcasting service is not yet on air at this site. LIC or LI is an intermediate stage between SPA/SP and OPE/OP;
- Under Technical Investigation - In which case the Status is indicated as ICASA.

Stations with a status of OP, SP or LI are stations in the national database which have not yet been or are in the process of being internationally co-ordinated.

Category (Cat) [15]

In the respective columns of Category, the categorisation of the frequency assignment is given as follows:

- **PBS** - Public Broadcasting Service as per the definition in chapter one of the IBA Act 153 of 1993 as amended. This is applicable to only sound broadcasting (VHF/FM and MF/AM) assignments;

[14] The status LI, SP and OP indicate that the frequency have not been co-ordinated internationally while the status LIC, SPA and OPE have been co-ordinated.
[15] See section 31(2)(c) of the IBA Act 153 of 1993

- **PNS** - Public National Broadcasting Service as per the definition in chapter one of the IBA Act 153 of 1993;
- **PRS -** Public Regional Broadcasting Service as per the definition in chapter one of the IBA Act 153 of 1993;
- **CML** - Commercial Broadcasting Service as per the definition in chapter one of the IBA Act 153 of 1993 as amended; and
- **CTY** - Community Broadcasting Service as per the definition in chapter one of the IBA Act 153 of 1993 as amended.

A blank category field indicates that the frequency has not yet been assigned to any service.

5 References

ITU [1975] (GE75) Final Acts of the Regional Administration LF/MF Broadcasting Conference (Regions 1 and 3), Geneva 1975 (ITU, Geneva, 1975)

ITU [1984] (GE84) Final Acts of the Regional Administrative Radio Conference for the planning of VHF sound broadcasting. (Region 1 and part of Region 3), Geneva 1984 (ITU, Geneva, 1984)

ITU [1989](GE89) Final Acts of the Regional Administrative Conference for the planning of VHF/UHF Television Broadcasting in the African Broadcasting Area and Neighbouring Countries, Geneva, 1989 (ITU, Geneva, 1989)

ITU [2001] Radio Regulations, edition of 2001 (ITU, Geneva, 2001)

IBA ACT Independent Broadcasting Authority Act, No. 153 of 1993

TRIPLE INQUIRY REPORT Independent Broadcasting Authority Triple Inquiry Report 1995

BROADCASTING ACT **Act No. 4 of 1999 as amended**

SABRE 1 South African Band Replanning Exercise (30 MHz - 3 GHz), 1997