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GENERAL NOTICE

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INDEPENDENT BROADCASTING AUTHORITY

TELEVISION TECHNICAL REGULATIONS

The Independent Broadcasting Authority hereby publishes its Television Technical Regulations. These regulations were made in terms of section 78(1)(A) of the Independent Broadcasting Authority Act (Act No. 153 of 1993), as amended. The regulations are as contained in the schedule.

SCHEDULE

TELEVISION TECHNICAL REGULATIONS

1. DEFINITIONS

For the purposes of these regulations the following terms shall have the meanings defined below. The meanings are consistent for the definitions as contained in the Independent Broadcasting Authority Act 1993 and the International Telecommunication Union Radio Regulations 1992.

1.1 **Act** - the Independent Broadcasting Authority Act 1993

1.2 **Assigned Frequency** - the centre of the frequency band assigned to a station

1.3 **Authority** - the Independent Broadcasting Authority

1.4 **Broadcasting** - any form of unidirectional telecommunication intended for direct reception by the public or sections of the public or subscribers to any broadcasting service having appropriate receiving facilities whether they carried out by means of radio or any other means of telecommunication or any combination of the above mentioned.

1.5 **Broadcasting Service** - a single defined service which consists in the broadcasting of television or sound material to the public or sections of the public or to the subscribers to such service.

1.6 **Broadcasting Services Frequency Bands** - that part of the electromagnetic radio frequency spectrum which is assigned for the use of broadcasting services by the International Telecommunication Union in so far such assignments have been agreed to/adopted by the Republic as well as any other additional part of the radio frequency spectrum determined nationally for the use of broadcasting services.

1.7 **Coverage Area** - the area within which the field strength of the wanted transmitter is equal to or greater than the usable field strength.(See table at end of Annexure)

1.8 **Effective Radiated Power** - the product of the power supplied to the antenna and its gain relative to a half wave dipole in a given direction.

1.9 **Emission** - radiation produced or the production of radiation by a radio transmitting station.

1.10 **Frequency Tolerance** - the maximum permissible departure by the centre frequency of the frequency band occupied by an emission from the assigned frequency.

1.11 **Gain of an Antenna** - the ratio expressed in decibels of the power required at the input of a loss free reference antenna to the power supplied to the input of the given antenna to produce in a given direction the same field strength.

1.12 **Licensee** - the holder of any licence granted and issued under the Act.

1.13 **Necessary bandwidth** - for a given class of emission the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

1.14 **Out of band emission** - emission on a frequency or frequencies immediately outside the necessary bandwidth which results from a modulation process but excluding spurious emissions.

1.15 **Power** - whenever the power of the radio transmitter is referred to, it shall be expressed in one of the following forms according to the class of emission using the symbols indicated:

Peak envelope power	PX
Mean power	PY
Carrier power	PZ.

1.16 **Peak envelope power of a radio transmitter** - the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions.

1.17 **Mean power of a radio transmitter** - the average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

1.18 **Carrier power of a radio transmitter** - the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle taken under the condition of no modulation.

1.19 **Radiation** - the output flow of energy from any source in a form of radio waves.

1.20 **Radio** - an electromagnetic wave propagated in space without artificial guide and having, by convention, a frequency lower than 3 000 GHz.

1.21 **Radiocommunication** - telecommunication by means of radio waves.

1.22 **Service Area** - that part of the coverage area in which the licensee has the right to demand that agreed protection conditions be provided.

1.23 **Signal Distribution** - the whole or any part of the process whereby the output signal of the broadcasting service is taken from the point of origin being the point where such signal is made available in its final content format from where it is conveyed to any geographical broadcast target area whether it is transmitted by radio or other means of telecommunication for reception by subscribers or by the public or by sections of the public.

1.24 **Spurious Emission** - emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic

emission, parasitic emissions, intermodulation products and frequency conversion products but exclude out of band emissions.

1.25 **Station** - one or more transmitters or receivers or a combination of transmitters and receivers including the accessory equipment necessary at one location for carrying on a radio- communication service.

1.26 **Telecommunication** - any system or method of conveying signs, signals, sounds, communications or other information by means of electricity, magnetism, electromagnetic waves or any agency of a like nature whether with or without the aid of tangible conductors from one point to another.

1.27 **Television Broadcasting Service** - a broadcasting service consisting in the sending of visual images or other visible signals whether with or without accompanying sounds where the visual images are such that sequences of them are seen as moving pictures.

1.28 **Usable Field Strength** - the minimum value of field strength necessary to permit a desired reception quality under specified receiving conditions in the presence of natural and man made noise and interference. A usable field strength value of 70 dBuV/m shall be used for the coverage contour in urban and/or densely populated areas and a usable field strength value of 60 dBuV/m in rural and/or sparsely populated areas.

2. TELEVISION BROADCASTING SERVICES FREQUENCY BANDS

The following spectrum is currently allocated to television broadcasting in South Africa.

2.1 Very high frequency television broadcasting (VHF) Band III:

174 MHz to 238 MHz

246 MHz to 254 MHz

2.2 Ultra high frequency television broadcasting (UHF) Band IV/V:

470 MHz to 854 MHz

3. TECHNICAL STANDARDS AND TRANSMISSION CHARACTERISTICS FOR TELEVISION BROADCASTING

The television system to be used in South Africa and CCIR System I with PAL Colour.

A uniform channel spacing of 8MHz shall be used.

In each channel the nominal vision carrier frequency is situated at 1.25MHz above the lower limit of the channel and the associated sound carrier frequency is higher than the vision carrier frequency.

3.1 CHANNEL NUMBERING IN BAND III (174 - 238MHz AND 246 - 254MHz)

Channel No.	Channel Limits (MHz)	Vision Carrier Freq (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	247.43

The non standard vision carrier frequency for channel 13 has been chosen so that the vestigial side-band colour sub-carrier notch filter will give maximum protection to the international distress frequency of 243MHz.

3.2 CHANNEL NUMBERING IN BAND IV/V (470 - 854MHz)

CHANNEL NUMBERING	CHANNEL LIMITS (MHz)	NOMINAL 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
50	702 - 710	703.25

CHANNEL NUMBERING	CHANNEL LIMITS (MHz)	NOMINAL VISION CARRIER FREQUENCY (MHz)
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

4. TABLE OF TRANSMITTER FREQUENCY TOLERANCES

FREQUENCY BAND	TOLERANCE
174 MHz to 254 MHz	500 Hz
470 MHz to 854 MHz	500 Hz(1)

(1) for stations of 1W (vision peak envelope power) or less this tolerance may be relaxed to 10kHz in rural areas at the sole discretion of the Authority.

5. TABLE OF MAXIMUM PERMITTED SPURIOUS EMISSION POWER LEVEL

The following table indicates 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.

Spurious emission from any part of the installation other than the antenna and its transmission line shall not have an effect greater than would occur if this antenna system were supplied with the maximum permitted power at that spurious emission frequency.

For any spurious component the attenuation (mean power within the necessary bandwidth relative to the mean power of the spurious component concerned) shall be at least that specified below.

The absolute mean power level given shall not be exceeded

FREQUENCY BAND	SPURIOUS EMISSION LEVEL
174 MHz to 254 MHz Tx o/p > 25W Tx o/p <25W	60dB/1mW 40db/25$_u$W
470 MHz to 854 MHz Tx o/p > 25W Tx o/p < 25W	60dB/1mW 40dB/25$_u$W

6. DESIGNATION OF EMISSION

Emissions are designated according to their necessary bandwidth and their classification. The necessary bandwidth is expressed by three numerals and one letter. The letter occupies the position of the decimal point and represents the unit of bandwidth.

Emissions are classified according to a set of basic characteristics and are designated by standard symbols.

First symbol - type of modulation of the main carrier.

Amplitude modulated double sideband	A
Vestigial sideband	C
Frequency modulation	F

Second symbol - nature of signal(s) modulating the main carrier

Single channel containing analogue information	3
Two or more channels containing analogue information	8

Third symbol - type of information to be transmitted

Sound broadcasting	E
Television	F

Fourth symbol - details of signal(s)

Monophonic sound broadcasting	G
Stereophonic sound broadcasting	H
Colour television broadcasting	N

Fifth symbol - nature of multiplexing

None	N
Frequency division multiplex	F

For the full designation of an emission, the necessary bandwidth, indicated in four characters shall be added just before the classification symbols.

7. MAXIMUM EFFECTIVE RADIATED POWER (erp)

In principle, except in the frequency band 3 900 - 4 000kHz, broadcasting stations using frequencies below 5 060kHz or above 41MHz shall not employ power exceeding that necessary to maintain economically an effective national service of good quality within the frontiers of the country concerned. (ITU RR2666)

VHF Television Band III	200kW
UHF Television Band IV/V	500kW

8. MODULATION STANDARDS, EMISSION BANDWIDTH CHARACTERISTICS OF THE RADIATED SIGNALS

Characteristics		
FREQUENCY SPACING	Nominal radio-frequency channel bandwidth (MHz)	8
	Sound carrier relative to vision carrier (Mhz)	+5.9996 ±0.0005
	Nearest edge of channel relative to vision carrier (Mhz)	-1.25
	Nominal width of main sideband (MHz)	5.5
	Nominal width of vestigial sideband (MHz)	1.25
Minimum attenuation of vestigial sideband (dB and MHz)		20 (-3.0) 30 (-4.43)
Type and polarity of vision modulations		C3F neg.
LEVELS IN THE RADIATED SIGNAL (% OF PEAK CARRIER)	Synchronizing level	100
	Blanking level	76 ± 2
	Difference between black level and blanking level	0 (nominal)
	Peak white-level	20 ± 2
Type of sound modulation		F3E
Frequency deviation (kHz)		± 50
Pre-emphasis for modulation (us)		50
Ratio of effective radiated powers of vision/sound		10/1
Line frequency f_H and tolerance when operated non-synchronously (Hz)		15 625 ± 0.0001%

9. THE TECHNICAL SPECIFICATIONS CONTAINED IN THE NATIONAL STANDARD FOR TERRESTRIAL TELEVISION TRANSMISSIONS (SABS 1584) SHALL BE INCORPORATED HEREIN AND SHALL BE APPLICABLE TO ALL VHF/UHF TERRESTRIAL TELEVISION BROADCASTING SERVICES.

FIELDS STRENGTH VALUES FOR COVERAGE AREA PLANNING

FREQUENCY BAND	MINIMUM MEDIA FIELD STRENGTH (dB_uV/m)		
	URBAN	SUBURBAN	RURAL
Band III	75	65	50
Band IV	80	72	62
Band V	80	76	67

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