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CRAN: FM FREQUENCY OPTIMISATION & DSB FREQUENCY PLAN: STAKEHOLDERS MEETING

- Background to the Study into FM optimisation, T-DAB and DRM30
- Methodology followed during the studies
- Findings and outcome of the study for the different technologies
- Impact on the current licensed broadcasters
- Benefits to the Broadcasting Industry
- Question and answer session

- Shortage of Frequencies in FM Band
- Spectrum Efficiency ITU and World Tendencies (Digital technologies)
- Limited Interference Cases in FM Coverage
- Different License Audiences
- Namibian Landscape Unique Situation
- Requirement for Information for Media
- Requirement for National Coverage

- Optimise the FM Frequency Plan
 - Eliminate interference
 - Consider Neighbouring Country Coordinated ITU Frequency Assignments
 - Identify New FM Frequencies in Different Areas
- Create a T-DAB Plan for 2 Frequency Layers Nationally
 - Consider Neighbouring Country Coordinated ITU Frequency Allotments
- Create a DRM30 Frequency Plan with 6 Layer Allotments
 - Consider LF/MF International Frequency Assignments

- Technical Information Gathering
 - Licensees
 - Existing Transmission Stations & Technical Parameters
 - ITU Databases
 - Categories of Broadcast Stations
 - Neighbouring Countries
- Creation of Accurate Database
 - Database Sanatation
 - Interference Analysis of Each Existing Licenced Transmission point
 - Identify new frequency where required
 - Adapt transmission parameters
 - Consider Neighbouring Countries Coordinated Frequencies

- Expand Database for Technology where Required
 - Identify Frequencies
 - Interference Analysis
 - Add Frequency to the Plan
- International Coordination
 - Determine if Frequency needs to be coordinated
 - Determine increase in Nuisance Level
 - Adapt Technical Parameters of Station
 - Discussion with Neighbouring Countries
- Formalise Coordination and Notification with Neighbours and ITU

FM Optimisation

- Reduction in Interference between Radio Stations
- FM Frequency Changes Required
- Virtually Interference Free FM Database
- Spare Frequencies Identified in Specific Regions
- Possibility to Identify more Frequencies in Areas where Scarcity Exists
- Neighbouring Countries FM Stats.

Item	Country	GE84 Assignments
1	Angola	366
2	Botswana	292
3	Namibia	417
4	South Africa	1016
5	Zambia	283
6	Zimbabwe	189

T-DAB Frequency Plan

- 2 X Regional Allotments
- 1 X National Allotments
- Approximately 18 Radio Programs per Multiplex (54 nationally)
- FM (25 Programs maximum)
- Additional Features – Data, Text and Video
- FM Spectrum 87.5 to 108 MHz (20.6 MHz)
- T-DAB Spectrum 214 to 230 MHz (17 MHz)

DRM30

- Six Layers Nationally as SFN
- Clear DRM30 vs Noisy AM broadcasting
- Infrastructure relatively Expensive
- Operational Cost Relatively Expensive
- Large Coverage Area (Dependant on ERP and Ground Conductivity)

High Power Frequencies DRM30

Item	OS	Servicetyg	TX-Name	Freq.(MHz)	ERP(kW)	Sys	Longit.	Latit.
1	G75	LF/MF	TSUMEB	0.594	398.1072	A	017E38 00.000	19S17 00.000
2	G75	LF/MF	MARIENTAL	0.675	57.544	A	017E58 00.000	24S37 00.000
3	G75	LF/MF	RUNTU	0.747	199.5262	A	019E46 00.000	17S55 00.000
4	G75	LF/MF	OHOPHO	0.882	199.5262	A	013E50 00.000	18S04 00.000
5	G75	LF/MF	OTJIWARONGO	0.963	81.2831	A	016E38 00.000	20S28 00.000
6	G75	LF/MF	KEETMANSHOOP	1.224	81.2831	A	018E08 00.000	26S35 00.000
7	G75	LF/MF	WINDHOEK	1.26	162.181	A	017E06 00.000	22S35 00.000
8	G75	LF/MF	LUDERITZ	1.386	16.2181	A	015E10 00.000	26S39 00.000
9	G75	LF/MF	KARASBURG	1.467	81.2831	A	018E45 00.000	28S01 00.000
10	G75	LF/MF	ORANJEMUND	1.494	8.1283	A	016E25 00.000	28S33 00.000

The Study Revealed that Certain FM Frequency Changes will be Required.

Item	Transmitter Station	Region	Old Frequency (MHz)	New Frequency (MHz)	Service
1	Gotchas/Roeland	Hardap	99.3	100.2	Channel 7
2	Mariental	Hardap	104.9	103.7	Trustco
3	Stampriet	Hardap	103.2	107.5	SAN
4	Rundu	Kavango	107.2	95.9	Trustco
5	Outjo	Kunene	102.3	104	Channel 7
6	Gobabis	Omaheke	92.1	98.9	Omulunga
7	Gobabis	Omaheke	92.9	89.8	Lozi
8	Erongo Mountain	Erongo	92.2	90.1	Wave
9	Erongo Mountain	Erongo	95.4	102.1	Tsw
10	Erongo Mountain	Erongo	98.7	100.7	Channel 7
11	Erongo Mountain	Erongo	102.7	105.7	Hit Radio
12	Gam	Erongo	102.6	104.3	
13	Swakopmund	Erongo	98.4	98.5	Channel 7
14	Swakopmund	Erongo	104.7	102.3	Omulunga
15	Swakopmund	Erongo	97.5	91.6	Hit Radio
16	Swakopmund	Erongo	91.5	94.8	Carol Ann vd Walt
17	Wakvis Bay	Erongo	98.4	93.9	Channel 7
18	Wakvis Bay	Erongo	106.9	104.6	Westcoast
19	Wakvis Bay	Erongo	99.8	100.4	99
20	Wakvis Bay	Erongo	97.5	98	Hit Radio
21	Wakvis Bay	Erongo	91.5	87.7	Carol Ann vd Walt
22	Wakvis Bay	Erongo	93.3	90.3	Shipi FM
23	Omarura	Erongo	94.6	96.3	Omulunga
24	Usakos	Erongo	92.2	101.5	Wave
25	Affenberg	Erongo	92.2	91.5	Wave
26	Henties Bay	Erongo	99.8	101.6	99
27	Paries	Otjozondjupa	98.3	96.7	OV
28	Signalberg	Otjozondjupa	94	103	German
29	Otjiberg	Otjozondjupa	105.4	107.6	Cosmos
30	Signalberg	Otjozondjupa	105.9	93.5	John Walenga
31	Grootfontein	Otjozondjupa	92	100.3	Omulunga
32	Oshakati	The 4 O Region	100.9	94.5	Radio Energy
33	Omuthiya	The 4 O Region	98.8	100.8	OV
34	Omuthiya	The 4 O Region	89.2	94.3	NAT

- More and Interference Free FM Transmissions
- Possibility to Expand FM Frequency Plan even Further (Add Frequencies to Plan)
- Sanatised FM Database.
- Possibility of 54 T-DAB Programs Nationally
- T-DAB - More Cost Effective Broadcasting (20 transmitters and antennas vs 1 Multiplexed Transmitter)
- New Licensing Scheme for T-DAB and DRM30
- 6 DRM Layers expandable over Large Areas
- New Opportunities for Operators & Broadcasters

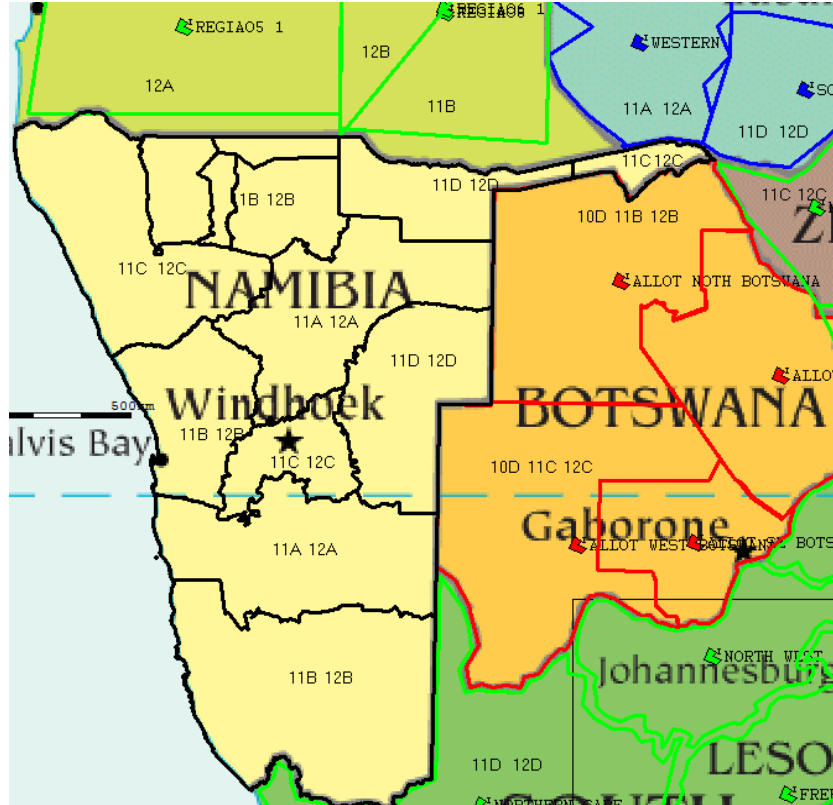
Additional FM Frequencies

Item	OS	Service	TX-Name	Freq. (MHz)	ERP (kW)	Longit.	Latit.	Provin.	Pol.	Site H.	Ant.H.
1	SPA	FM	Aroab Tower	96.9	0.999	019E38 52.000	26S43 14.000	Kar	V	1022	150
2	SPA	FM	Aroab Tower	100.4	0.999	019E38 52.000	26S43 14.000	Kar	V	1022	150
3	SPA	FM	Gam	97.8	0.1	015E31 43.000	21S43 40.800	Ero	V	2264	220
4	SPA	FM	Gam	99.7	0.1	015E31 43.000	21S43 40.800	Ero	V	2264	220
5	SPA	FM	Gross-Hertzog	91	5	017E03 41.000	22S42 32.000	Kho	V	2309	60
6	SPA	FM	Hentiesbay	106	0.1	014E16 58.000	22S01 01.000	Ero	V	67	20
7	SPA	FM	Keetmanshoop	105	0.002	018E08 10.000	26S34 23.000	Kar	V	1006	70
8	SPA	FM	Keetmanshoop	103.5	0.002	018E08 10.000	26S34 23.000	Kar	V	1006	70
9	SPA	FM	Keetmanshoop	94.6	0.002	018E08 10.000	26S34 23.000	Kar	V	1006	70
10	SPA	FM	Koes	103.8	0.05	019E09 20.000	25S55 22.800	Kar	V	1127	30
11	SPA	FM	Koes	107.9	0.05	019E09 20.000	25S55 22.800	Kar	V	1127	30
12	SPA	FM	Okongo	104.1	4	017E23 24.000	17S37 52.000	T4R	V	1156	220
13	SPA	FM	Okongo	107.5	4	017E23 24.000	17S37 52.000	T4R	V	1156	220
14	SPA	FM	Outapi	100.6	0.1	014E59 18.600	17S30 33.840	T4R	V	1114	30
15	SPA	FM	Outapi	104	0.1	014E59 18.600	17S30 33.840	T4R	V	1114	30
16	SPA	FM	Rundu	93.7	2	019E45 47.000	17S54 48.650	Kav	V	1106	200
17	SPA	FM	Rundu	96.9	2	019E45 47.000	17S54 48.650	Kav	V	1106	200

■ New T-DAB Allotments

Item	Servicetype	Allot. Name	Freq.	CH.	Ctry	RefNetwork	Ref. Plan. Cond	Bandwidth
1	T-DAB	KHOMAS	220.352	11C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
2	T-DAB	KHOMAS	227.36	12C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
3	T-DAB	CAPRIVI	220.352	11C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
4	T-DAB	CAPRIVI	227.36	12C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
5	T-DAB	HARDAP	216.928	11A	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
6	T-DAB	HARDAP	223.936	12A	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
7	T-DAB	ODJOZONDJUPA	216.928	11A	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
8	T-DAB	ODJOZONDJUPA	223.936	12A	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
9	T-DAB	KUNENE	220.352	11C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
10	T-DAB	KUNENE	227.36	12C	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
11	T-DAB	KARAS	218.64	11B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
12	T-DAB	KARAS	225.648	12B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
13	T-DAB	ERONGO	218.64	11B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
14	T-DAB	ERONGO	225.648	12B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
15	T-DAB	OMAHEKE	222.064	11D	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
16	T-DAB	OMAHEKE	229.072	12D	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
17	T-DAB	THE 4 O REGIONS	218.64	11B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
18	T-DAB	THE 4 O REGIONS	225.648	12B	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
19	T-DAB	KAVANGO	222.064	11D	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
20	T-DAB	KAVANGO	229.072	12D	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536
21	T-DAB	NATIONAL	215.072	10D	NMB	(RN5) 7 TX closed	(RPC4) Mobile	1.536

■ New T-DAB Allotments





Thank you for your attention

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