

Standard Radio System Plan

**REQUIREMENTS FOR DIGITAL TRUNKED
RADIO SYSTEMS (DTRS) OPERATING
IN THE FREQUENCY BAND
410 MHz TO 430 MHz**



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1.0 GLOSSARY

- 1.1 The terms used in this document may be found in the document SRSP Glossary which can be downloaded from SKMM website.
(http://www.skmm.gov.my/what_we_do/spectrum/srsp.asp)

REQUIREMENTS FOR DIGITAL TRUNKED RADIO SYSTEMS (DTRS) OPERATING IN THE FREQUENCY BAND 410 MHz TO 430 MHz

2.0 INTENT

- 2.1 This Standard Radio System Plan (SRSP) states the requirements for the utilisation of the frequency band between 410 MHz to 430 MHz for Digital Trunked Radio Systems, (DTRS) in Malaysia.
- 2.2 Digital Trunked Radio Systems (DTRS) are two-way mobile radio systems that consist of multiple-channel repeater stations and their control stations, serving a number of base and mobile terminals. Trunking is the pooling of radio channels or resources of a DTRS, whereby users have automatic access to all channels of the system. DTRS also have roaming capabilities and permit Direct Mode Operation between mobile terminals.
- 2.3 The intended services include transmission of voice, data, image, paging, short messaging, facsimile and PSTN/Mobile cellular interconnection for trunked radio users.
- 2.4 In general, a SRSP is a document designed to provide information on the minimum requirements in the use of a frequency band as described in the Spectrum Plan (see **Appendix A**). It provides information on technical characteristics of radio systems, frequency channelling, coordination initiatives in order to maximise the utilisation, minimise interference and optimise the usage of the band. It is intended to regulate the usage of spectrum and does not attempt to establish any detailed equipment standards.

3.0 GENERAL

- 3.1 Technical characteristics of equipment used in such systems shall conform to all applicable Malaysian standards, international standards, International Telecommunications Union (ITU) and its radio regulations as agreed and adopted by Malaysia.
- 3.2 All installations must comply with safety rules as specified in applicable standards.
- 3.3 The equipment used shall be certified under the Communications and Multimedia (Technical Standards) Regulations 2000.
- 3.4 The assignment, allocation and allotment of this frequency band and the information in this SRSP are subject to review from time to time to reflect new developments in the communications and multimedia industry.
- 3.5 Leased Channel Systems in Malaysia operate in the 200 MHz and 400 MHz frequency bands and analogue trunked radio service operate in the 800 MHz

frequency band. These systems are gradually being replaced by the more spectrally and functionally efficient Digital Trunked Radio Systems.

3.6 The following is an overview of some DTRS technologies in the industry:

3.6.1 TETRA

TETRA (Terrestrial Trunked Radio) is a standard developed by the European Telecommunications Standards Institute (ETSI). The purpose of the TETRA standard is to meet the needs of various Professional Mobile Radio (PMR) user organizations. The first version of TETRA standard was published in 1995.

TETRA is based on a 4-slot TDMA (Time Division Multiple Access) with 25 KHz physical radio channel bandwidth. TETRA standard supports trunking mode and IP-based TETRA solutions are available.

Recently, ETSI has completed works on TETRA 2 as the enhancement of the current TETRA standard. The enhancement is expected to improve TETRA in data speed and TETRA voice codec.

3.6.2 APCO-P25

APCO-P25 (Association of Public-Safety Communications Officials – Project 25) is a common standard for Digital Trunked Radio Systems use by public safety agencies in North America to enable them to communicate with other agencies and mutual aid response teams in emergencies.

APCO-P25 is based on FDMA (Frequency Division Multiple Access) capable of operating in 12.5 KHz and/or 25 KHz physical radio channel bandwidth. This standard allows backward compatibility with analogue systems and supports both trunked and conventional operation model. IP based APCO-P25 solutions are also available.

APCO-P25 Phase 2

The current APCO-P25 standard (also known as APCO-P25 Phase 1) is further improved with the development of APCO-P25 Phase 2. As part of APCO-P25 Phase 2, works to further improve spectrum efficiency on 2-slot TDMA within 12.5 KHz FDMA are ongoing.

The APCO-P25 Phase2 equipment is expected be backward compatible with the existing APCO-P25 Phase 1.

3.6.3 NXDN

NXDN is a digital air interface protocol for mobile communication. It was developed jointly by Icom Incorporated and Kenwood Corporation. This standard is based on FDMA (Frequency Division Multiple Access) and defines both trunked and conventional modes of operation.

NXDN is a digital radio communications protocol using 4-Level FSK (4LFSK) modulation capable of fitting into both 12.5 kHz and 6.25 kHz physical radio channel bandwidth (9600 bps and 4800 bps respectively).

3.6.4 DMR

DMR (Digital Mobile Radio) is a standard developed by the European Telecommunications Standards Institute (ETSI) under its Electromagnetic compatibility and Radio spectrum Matters (ERM). The standard (ETSI TS 102 361) is based on a two-slot TDMA protocol. DMR applies TDMA method of spectral efficiency of where 12.5 kHz channel will be divided into two equivalent time slots. The DMR design is capable to support trunked radio networks range from 12.5 kHz physical radio channel to wide area systems incorporating multiple physical radio channels extended over many radio sites. It provides a migration path from analogue to digital with its ability to operate in both analogue and digital mode.

4.0 CHANNELLING PLAN

- 4.1 The SRSP defines the frequency bands 410 to 430 MHz providing a total bandwidth of 20MHz for Digital Trunked Radio Systems (DTRS). The 12.5 kHz channelling plan is the standard channelling plan for this band giving a total of 800 physical radio channels (or equivalent TRS analogue traffic channel of 1600 noting possibility of two time slots per physical channel)
- 4.2 Although the standard channel spacing is 12.5 kHz, it provides flexibility to operate two contiguous channels (i.e. 2 x 12.5 kHz) if needed. SKMM shall assign a single channel based on channel spacing 12.5 kHz or combination of multiple channels of 12.5 kHz channel spacing as was developed in the channelling plan as in **Appendix B**.
- 4.3 The channel arrangements are divided into 4 pairs of frequency blocks (blocks A/A', blocks B/B', blocks C/C', and blocks D/D') with transmit/receive separation of 10MHz.
- 4.4 Channels shall be allotted according to the channel allotment plan in **Appendix C**. Assignment of channels for areas of operation near the borders with Brunei, Singapore and Thailand will be based on the regional frequency blocks allotted.
- 4.5 The channel allotment plan is designed to minimise inter-modulation and frequency interference problems by assigning co-sited channels that are 250 kHz apart. The frequency blocks A, B, C and D, which contain 200 channels each, are divided into ten (10) channel groups (i.e. A01-A10, B01-B10, C01-C10 and D01-D10) respectively.
- 4.6 Channels are assigned based on the three defined geographic area as in Appendix F (Sabah or Sarawak or Peninsular Malaysia). Co-location assignments will be by

channel groups (or part thereof) up to a maximum of twenty (20) channels within the same channel group per DTRS base/repeater station. The number of channels/channel groups assigned will be based on the service requirement of the operator justified based among others on the area covered, grade of service (GOS), capacity and services provided.

5.0 REQUIREMENTS FOR USAGE OF SPECTRUM

- 5.1 This SRSP covers the minimum key characteristics considered necessary in order to make the best use of the available frequency band.
- 5.2 Capacity enhancing techniques are continually being developed. This SRSP allows for adoption of such techniques for more efficient use of spectrum, without reducing quality of service. Good cell-planning practice and frequency reuse should be adopted to maximise spectrum usage.
- 5.3 Channel loading of DTRS should be such that maximum use is made of the available spectrum while providing reasonable grade of service. This SRSP requires the loading of public and private systems to provide a Grade of Service (GOS) of at least five percent (5%).
- 5.4 SKMM will use the Erlang C model as a guide to assess the channel needs of the applicant. This model is adopted as the reference as it assumes that the system will queue a certain number of blocked calls. The Grade of Service will be defined by a specified delay, in message lengths, such that calls delayed will not exceed the specified delay with a probability $P(t)$ of 0.05 (5%). That is, 95% of the calls placed will not be delayed by greater than the specified delay. An Erlang C table is provided in **Appendix D** for reference.
- 5.5 Users shall note the possibility of interference to Active Medical Implant equipment operating in the band 402 MHz to 405 MHz and Radio Frequency Identification Device (RFID) in the band 433 MHz to 435 MHz and shall take additional precautionary measures when operating in close proximity to such devices/equipment.
- 5.6 The allocations of spectrum and shared services within these bands are found in an extract from the Spectrum Plan as shown in **Appendix A**.

6.0 PRINCIPLES OF ASSIGNMENT

- 6.1 Authorization to use the DTRS spectrum for the base/**repeater station** apparatus is by way of **Apparatus Assignment (AA)** and the **trunked radio access device** is by way of **Class assignment (CA)**. Please refer to www.skmm.gov.my for the condition of use in the Notification of Issuance of Class Assignment for the trunked radio access device.
- 6.2 Eligible persons who may apply for assignments are:

6.2.1 Spectrum Blocks A , B and C

- 6.2.1.1 Network Facilities Provider Individual (NFP(I)) licence that provides radiocommunication transmitters and links (Note: Priority on the usage of these blocks are for migration of the current analogue service providers listed in **Appendix E**).
- 6.2.1.2 The applicant shall:
- 6.2.1.2.1 submit a Detailed Business Plan based on wholesale model and defined geographic area (**Appendix G**) including details of the roll out and digital migration plan acceptable by the Commission;
 - 6.2.1.2.2 upon the approval of the Detailed Business Plan by the Commission, submit application for AA in accordance with the geographic region/s specified in the Detailed Business Plan; and
 - 6.2.1.2.3 prior to the issuance of the AA, provide to the Commission an Irrevocable Bank Guarantee to guarantee performance and compliance with the conditions of the AA and the Detailed Business Plan, payable on demand, either in part or in full, for the amount of RM 50,000 (Ringgit Malaysia Fifty Thousand) per defined geographic area from a licensed financial institution in Malaysia in the form and substance agreed by the Commission, which shall be valid for the period of the AA.
- 6.2.1.3 The finalised size of spectrum made available on the geographic region basis to the applicant shall be based on the principle of:
- 6.2.1.3.1 the percentage total of analogue TRS AA held as in **Appendix E**;
 - 6.2.1.3.2 the needs of the technology of choice; and
 - 6.2.1.3.3 spectrum allocation efficiency.
- 6.2.1.4 The application for AA shall be based on the committed roll out plan as specified in the Detailed Business Plan. For spectrum which are available or not utilised or under utilised or not covered by the roll out plan, SKMM may allow other NFP(I) licensees to apply for an AA.
- 6.2.1.5 AA issued to successful applicant shall be subject to further additional conditions specified in **Appendix F**.

6.2.2 Block D

- 6.2.2.1 Private network facility (Private corporation/companies) for own offshore/inland private use only and government [Note: This is set aside for migration of existing private networks and government users in the 800 MHz as well as for new users].

- 6.3 Applicants are required to submit AA applications for the apparatus on the prescribed AA forms.
- 6.4 The AA for these bands shall be valid for a period of five (5) years or such lesser period as specified in the AA. AA holders may re-apply for a new assignment at least sixty (60) days before the expiry date.
- 6.5 Issuance of an AA is also subject to successful co-ordination among assigned stations and with neighbouring administrations where it applies.
- 6.6 Other than the spectrum blocks/channel groups reserved for migration, the AA be on a first come first served basis. In the event of unavailability of spectrum, applicants will be placed in the queue that will be reviewed periodically.
- 6.7 To further facilitate planning and efficiency in spectrum management, upon successful application the NFP(I) licence holder shall be allocated with the specific spectrum channel group(s) (Appendix C) in the defined geographic area as in **Appendix G** of this document. Such arrangements are only for administrative or spectrum management purposes in order to facilitate the NFP(I) licensees in their roll out planning in the defined geographic region.

7.0 IMPLEMENTATION

- 7.1 This SRSP shall be effective from the date of issuance of this document.
- 7.2 The reservation of the spectrum blocks for the migration of the listed operators in **Appendix E** and TRS users in Block C of the 800 MHz band will be upheld up to December 2015. The unused blocks shall be opened to others on a first come first served basis.

8.0 CO-ORDINATION REQUIREMENT

- 8.1 Use of these frequency bands shall require coordination with the neighbouring countries within the following coordination zones:
 - 8.1.1 Within 50 kilometers of Malaysian border with FACSMAB (Frequency Assignment Committee of Singapore, Malaysia and Brunei Darussalam) member countries; and
 - 8.1.2 Within 30 kilometers of the Malaysian border with Thailand.
- 8.2 The sharing in the use of the frequency 410 – 430 MHz between Brunei Darussalam, Malaysia, Singapore and Thailand for DTRS at the common border areas has been agreed as shown in Appendix H and I.

8.3 In the event of any interference, SKMM will require affected users to carry out an operator-to-operator coordination. In the event that the interference remained unresolved after 24 hours by the operators, the affected parties may escalate the matter to SKMM for a resolution. SKMM will decide the necessary modifications and schedule of modifications to resolve the dispute. SKMM will be guided by the interference resolution process as shown in **Appendix J**.

9.0 REVOCATION

9.1 Not applicable

10.0 REFERENCES

- [1] Spectrum Plan
- [2] **SRSP-501 (Canada)** Technical Requirements for Land Mobile and Fixed Radio Services operating in the bands 406.1 - 430 MHz and 450 - 470 MHz
- [3] SKMM WTS LMR Rev.1.01:2007
- [4] UK Radio Interface Requirement 2004, Private Business Mobile Radio (TETRA)
- [5] <http://www.apcointl.org/frequency/project25/> Comprehensive APCO25 Information and Website

Issued by:



Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission

APPENDIX A: SPECTRUM PLAN 410 MHz TO 430 MHz

Frequency Band (MHz)	ITU Allocations			Malaysian Allocations
	Region 1	Region 2	Region 3	
410-420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268			FIXED MOBILE except aeronautical mobile MLA37 SPACE RESEARCH (space-to-space) 5.268 MLA3
420-430	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271			FIXED MOBILE except Aeronautical mobile MLA37 Radiolocation MLA3

5.268 Use of the band 410-420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed $-153 \text{ dB(W/m}^2\text{)}$ for $0^\circ \leq \delta \leq 5^\circ$, $-153 + 0.077 (\delta - 5) \text{ dB(W/m}^2\text{)}$ for $5^\circ \leq \delta \leq 70^\circ$ and $-148 \text{ dB(W/m}^2\text{)}$ for $70^\circ \leq \delta \leq 90^\circ$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. 4.10 does not apply to extra-vehicular activities. In this frequency band the space research (space-to-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. (WRC-97)

5.269 *Different category of service:* in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. 5.33).

5.270 *Additional allocation:* in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.

5.271 *Additional allocation:* in Belarus, China, India, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-07)

MLA3 Notification of Issuance of Class Assignments

APPENDIX B: CHANNELING PLAN (12.5 kHz)

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
1	420.006125	410.006125
2	420.018625	410.018625
3	420.031125	410.031125
4	420.043625	410.043625
5	420.056125	410.056125
6	420.068625	410.068625
7	420.081125	410.081125
8	420.093625	410.093625
9	420.106125	410.106125
10	420.118625	410.118625
11	420.131125	410.131125
12	420.143625	410.143625
13	420.156125	410.156125
14	420.168625	410.168625
15	420.181125	410.181125
16	420.193625	410.193625
17	420.206125	410.206125
18	420.218625	410.218625
19	420.231125	410.231125
20	420.243625	410.243625
21	420.256125	410.256125
22	420.268625	410.268625
23	420.281125	410.281125
24	420.293625	410.293625
25	420.306125	410.306125
26	420.318625	410.318625
27	420.331125	410.331125
28	420.343625	410.343625
29	420.356125	410.356125
30	420.368625	410.368625
31	420.381125	410.381125
32	420.393625	410.393625
33	420.406125	410.406125
34	420.418625	410.418625
35	420.431125	410.431125
36	420.443625	410.443625
37	420.456125	410.456125
38	420.468625	410.468625
39	420.481125	410.481125
40	420.493625	410.493625
41	420.506125	410.506125
42	420.518625	410.518625
43	420.531125	410.531125
44	420.543625	410.543625
45	420.556125	410.556125
46	420.568625	410.568625
47	420.581125	410.581125
48	420.593625	410.593625
49	420.606125	410.606125
50	420.618625	410.618625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
51	420.631125	410.631125
52	420.643625	410.643625
53	420.656125	410.656125
54	420.668625	410.668625
55	420.681125	410.681125
56	420.693625	410.693625
57	420.706125	410.706125
58	420.718625	410.718625
59	420.731125	410.731125
60	420.743625	410.743625
61	420.756125	410.756125
62	420.768625	410.768625
63	420.781125	410.781125
64	420.793625	410.793625
65	420.806125	410.806125
66	420.818625	410.818625
67	420.831125	410.831125
68	420.843625	410.843625
69	420.856125	410.856125
70	420.868625	410.868625
71	420.881125	410.881125
72	420.893625	410.893625
73	420.906125	410.906125
74	420.918625	410.918625
75	420.931125	410.931125
76	420.943625	410.943625
77	420.956125	410.956125
78	420.968625	410.968625
79	420.981125	410.981125
80	420.993625	410.993625
81	421.006125	411.006125
82	421.018625	411.018625
83	421.031125	411.031125
84	421.043625	411.043625
85	421.056125	411.056125
86	421.068625	411.068625
87	421.081125	411.081125
88	421.093625	411.093625
89	421.106125	411.106125
90	421.118625	411.118625
91	421.131125	411.131125
92	421.143625	411.143625
93	421.156125	411.156125
94	421.168625	411.168625
95	421.181125	411.181125
96	421.193625	411.193625
97	421.206125	411.206125
98	421.218625	411.218625
99	421.231125	411.231125
100	421.243625	411.243625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
101	421.256125	411.256125
102	421.268625	411.268625
103	421.281125	411.281125
104	421.293625	411.293625
105	421.306125	411.306125
106	421.318625	411.318625
107	421.331125	411.331125
108	421.343625	411.343625
109	421.356125	411.356125
110	421.368625	411.368625
111	421.381125	411.381125
112	421.393625	411.393625
113	421.406125	411.406125
114	421.418625	411.418625
115	421.431125	411.431125
116	421.443625	411.443625
117	421.456125	411.456125
118	421.468625	411.468625
119	421.481125	411.481125
120	421.493625	411.493625
121	421.506125	411.506125
122	421.518625	411.518625
123	421.531125	411.531125
124	421.543625	411.543625
125	421.556125	411.556125
126	421.568625	411.568625
127	421.581125	411.581125
128	421.593625	411.593625
129	421.606125	411.606125
130	421.618625	411.618625
131	421.631125	411.631125
132	421.643625	411.643625
133	421.656125	411.656125
134	421.668625	411.668625
135	421.681125	411.681125
136	421.693625	411.693625
137	421.706125	411.706125
138	421.718625	411.718625
139	421.731125	411.731125
140	421.743625	411.743625
141	421.756125	411.756125
142	421.768625	411.768625
143	421.781125	411.781125
144	421.793625	411.793625
145	421.806125	411.806125
146	421.818625	411.818625
147	421.831125	411.831125
148	421.843625	411.843625
149	421.856125	411.856125
150	421.868625	411.868625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
151	421.881125	411.881125
152	421.893625	411.893625
153	421.906125	411.906125
154	421.918625	411.918625
155	421.931125	411.931125
156	421.943625	411.943625
157	421.956125	411.956125
158	421.968625	411.968625
159	421.981125	411.981125
160	421.993625	411.993625
161	422.006125	412.006125
162	422.018625	412.018625
163	422.031125	412.031125
164	422.043625	412.043625
165	422.056125	412.056125
166	422.068625	412.068625
167	422.081125	412.081125
168	422.093625	412.093625
169	422.106125	412.106125
170	422.118625	412.118625
171	422.131125	412.131125
172	422.143625	412.143625
173	422.156125	412.156125
174	422.168625	412.168625
175	422.181125	412.181125
176	422.193625	412.193625
177	422.206125	412.206125
178	422.218625	412.218625
179	422.231125	412.231125
180	422.243625	412.243625
181	422.256125	412.256125
182	422.268625	412.268625
183	422.281125	412.281125
184	422.293625	412.293625
185	422.306125	412.306125
186	422.318625	412.318625
187	422.331125	412.331125
188	422.343625	412.343625
189	422.356125	412.356125
190	422.368625	412.368625
191	422.381125	412.381125
192	422.393625	412.393625
193	422.406125	412.406125
194	422.418625	412.418625
195	422.431125	412.431125
196	422.443625	412.443625
197	422.456125	412.456125
198	422.468625	412.468625
199	422.481125	412.481125
200	422.493625	412.493625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
201	422.506125	412.506125
202	422.518625	412.518625
203	422.531125	412.531125
204	422.543625	412.543625
205	422.556125	412.556125
206	422.568625	412.568625
207	422.581125	412.581125
208	422.593625	412.593625
209	422.606125	412.606125
210	422.618625	412.618625
211	422.631125	412.631125
212	422.643625	412.643625
213	422.656125	412.656125
214	422.668625	412.668625
215	422.681125	412.681125
216	422.693625	412.693625
217	422.706125	412.706125
218	422.718625	412.718625
219	422.731125	412.731125
220	422.743625	412.743625
221	422.756125	412.756125
222	422.768625	412.768625
223	422.781125	412.781125
224	422.793625	412.793625
225	422.806125	412.806125
226	422.818625	412.818625
227	422.831125	412.831125
228	422.843625	412.843625
229	422.856125	412.856125
230	422.868625	412.868625
231	422.881125	412.881125
232	422.893625	412.893625
233	422.906125	412.906125
234	422.918625	412.918625
235	422.931125	412.931125
236	422.943625	412.943625
237	422.956125	412.956125
238	422.968625	412.968625
239	422.981125	412.981125
240	422.993625	412.993625
241	423.006125	413.006125
242	423.018625	413.018625
243	423.031125	413.031125
244	423.043625	413.043625
245	423.056125	413.056125
246	423.068625	413.068625
247	423.081125	413.081125
248	423.093625	413.093625
249	423.106125	413.106125
250	423.118625	413.118625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
251	423.131125	413.131125
252	423.143625	413.143625
253	423.156125	413.156125
254	423.168625	413.168625
255	423.181125	413.181125
256	423.193625	413.193625
257	423.206125	413.206125
258	423.218625	413.218625
259	423.231125	413.231125
260	423.243625	413.243625
261	423.256125	413.256125
262	423.268625	413.268625
263	423.281125	413.281125
264	423.293625	413.293625
265	423.306125	413.306125
266	423.318625	413.318625
267	423.331125	413.331125
268	423.343625	413.343625
269	423.356125	413.356125
270	423.368625	413.368625
271	423.381125	413.381125
272	423.393625	413.393625
273	423.406125	413.406125
274	423.418625	413.418625
275	423.431125	413.431125
276	423.443625	413.443625
277	423.456125	413.456125
278	423.468625	413.468625
279	423.481125	413.481125
280	423.493625	413.493625
281	423.506125	413.506125
282	423.518625	413.518625
283	423.531125	413.531125
284	423.543625	413.543625
285	423.556125	413.556125
286	423.568625	413.568625
287	423.581125	413.581125
288	423.593625	413.593625
289	423.606125	413.606125
290	423.618625	413.618625
291	423.631125	413.631125
292	423.643625	413.643625
293	423.656125	413.656125
294	423.668625	413.668625
295	423.681125	413.681125
296	423.693625	413.693625
297	423.706125	413.706125
298	423.718625	413.718625
299	423.731125	413.731125
300	423.743625	413.743625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
301	423.756125	413.756125
302	423.768625	413.768625
303	423.781125	413.781125
304	423.793625	413.793625
305	423.806125	413.806125
306	423.818625	413.818625
307	423.831125	413.831125
308	423.843625	413.843625
309	423.856125	413.856125
310	423.868625	413.868625
311	423.881125	413.881125
312	423.893625	413.893625
313	423.906125	413.906125
314	423.918625	413.918625
315	423.931125	413.931125
316	423.943625	413.943625
317	423.956125	413.956125
318	423.968625	413.968625
319	423.981125	413.981125
320	423.993625	413.993625
321	424.006125	414.006125
322	424.018625	414.018625
323	424.031125	414.031125
324	424.043625	414.043625
325	424.056125	414.056125
326	424.068625	414.068625
327	424.081125	414.081125
328	424.093625	414.093625
329	424.106125	414.106125
330	424.118625	414.118625
331	424.131125	414.131125
332	424.143625	414.143625
333	424.156125	414.156125
334	424.168625	414.168625
335	424.181125	414.181125
336	424.193625	414.193625
337	424.206125	414.206125
338	424.218625	414.218625
339	424.231125	414.231125
340	424.243625	414.243625
341	424.256125	414.256125
342	424.268625	414.268625
343	424.281125	414.281125
344	424.293625	414.293625
345	424.306125	414.306125
346	424.318625	414.318625
347	424.331125	414.331125
348	424.343625	414.343625
349	424.356125	414.356125
350	424.368625	414.368625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
351	424.381125	414.381125
352	424.393625	414.393625
353	424.406125	414.406125
354	424.418625	414.418625
355	424.431125	414.431125
356	424.443625	414.443625
357	424.456125	414.456125
358	424.468625	414.468625
359	424.481125	414.481125
360	424.493625	414.493625
361	424.506125	414.506125
362	424.518625	414.518625
363	424.531125	414.531125
364	424.543625	414.543625
365	424.556125	414.556125
366	424.568625	414.568625
367	424.581125	414.581125
368	424.593625	414.593625
369	424.606125	414.606125
370	424.618625	414.618625
371	424.631125	414.631125
372	424.643625	414.643625
373	424.656125	414.656125
374	424.668625	414.668625
375	424.681125	414.681125
376	424.693625	414.693625
377	424.706125	414.706125
378	424.718625	414.718625
379	424.731125	414.731125
380	424.743625	414.743625
381	424.756125	414.756125
382	424.768625	414.768625
383	424.781125	414.781125
384	424.793625	414.793625
385	424.806125	414.806125
386	424.818625	414.818625
387	424.831125	414.831125
388	424.843625	414.843625
389	424.856125	414.856125
390	424.868625	414.868625
391	424.881125	414.881125
392	424.893625	414.893625
393	424.906125	414.906125
394	424.918625	414.918625
395	424.931125	414.931125
396	424.943625	414.943625
397	424.956125	414.956125
398	424.968625	414.968625
399	424.981125	414.981125
400	424.993625	414.993625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
401	425.006125	415.006125
402	425.018625	415.018625
403	425.031125	415.031125
404	425.043625	415.043625
405	425.056125	415.056125
406	425.068625	415.068625
407	425.081125	415.081125
408	425.093625	415.093625
409	425.106125	415.106125
410	425.118625	415.118625
411	425.131125	415.131125
412	425.143625	415.143625
413	425.156125	415.156125
414	425.168625	415.168625
415	425.181125	415.181125
416	425.193625	415.193625
417	425.206125	415.206125
418	425.218625	415.218625
419	425.231125	415.231125
420	425.243625	415.243625
421	425.256125	415.256125
422	425.268625	415.268625
423	425.281125	415.281125
424	425.293625	415.293625
425	425.306125	415.306125
426	425.318625	415.318625
427	425.331125	415.331125
428	425.343625	415.343625
429	425.356125	415.356125
430	425.368625	415.368625
431	425.381125	415.381125
432	425.393625	415.393625
433	425.406125	415.406125
434	425.418625	415.418625
435	425.431125	415.431125
436	425.443625	415.443625
437	425.456125	415.456125
438	425.468625	415.468625
439	425.481125	415.481125
440	425.493625	415.493625
441	425.506125	415.506125
442	425.518625	415.518625
443	425.531125	415.531125
444	425.543625	415.543625
445	425.556125	415.556125
446	425.568625	415.568625
447	425.581125	415.581125
448	425.593625	415.593625
449	425.606125	415.606125
450	425.618625	415.618625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
451	425.63112	415.63112
452	425.64362	415.64362
453	425.65612	415.65612
454	425.66862	415.66862
455	425.68112	415.68112
456	425.69362	415.69362
457	425.70612	415.70612
458	425.71862	415.71862
459	425.73112	415.73112
460	425.74362	415.74362
461	425.75612	415.75612
462	425.76862	415.76862
463	425.78112	415.78112
464	425.79362	415.79362
465	425.80612	415.80612
466	425.81862	415.81862
467	425.83112	415.83112
468	425.84362	415.84362
469	425.85612	415.85612
470	425.86862	415.86862
471	425.88112	415.88112
472	425.89362	415.89362
473	425.90612	415.90612
474	425.91862	415.91862
475	425.93112	415.93112
476	425.94362	415.94362
477	425.95612	415.95612
478	425.96862	415.96862
479	425.98112	415.98112
480	425.99362	415.99362
481	426.00612	416.00612
482	426.01862	416.01862
483	426.03112	416.03112
484	426.04362	416.04362
485	426.05612	416.05612
486	426.06862	416.06862
487	426.08112	416.08112
488	426.09362	416.09362
489	426.10612	416.10612
490	426.11862	416.11862
491	426.13112	416.13112
492	426.14362	416.14362
493	426.15612	416.15612
494	426.16862	416.16862
495	426.18112	416.18112
496	426.19362	416.19362
497	426.20612	416.20612
498	426.21862	416.21862
499	426.23112	416.23112
500	426.24362	416.24362

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
501	426.256125	416.256125
502	426.268625	416.268625
503	426.281125	416.281125
504	426.293625	416.293625
505	426.306125	416.306125
506	426.318625	416.318625
507	426.331125	416.331125
508	426.343625	416.343625
509	426.356125	416.356125
510	426.368625	416.368625
511	426.381125	416.381125
512	426.393625	416.393625
513	426.406125	416.406125
514	426.418625	416.418625
515	426.431125	416.431125
516	426.443625	416.443625
517	426.456125	416.456125
518	426.468625	416.468625
519	426.481125	416.481125
520	426.493625	416.493625
521	426.506125	416.506125
522	426.518625	416.518625
523	426.531125	416.531125
524	426.543625	416.543625
525	426.556125	416.556125
526	426.568625	416.568625
527	426.581125	416.581125
528	426.593625	416.593625
529	426.606125	416.606125
530	426.618625	416.618625
531	426.631125	416.631125
532	426.643625	416.643625
533	426.656125	416.656125
534	426.668625	416.668625
535	426.681125	416.681125
536	426.693625	416.693625
537	426.706125	416.706125
538	426.718625	416.718625
539	426.731125	416.731125
540	426.743625	416.743625
541	426.756125	416.756125
542	426.768625	416.768625
543	426.781125	416.781125
544	426.793625	416.793625
545	426.806125	416.806125
546	426.818625	416.818625
547	426.831125	416.831125
548	426.843625	416.843625
549	426.856125	416.856125
550	426.868625	416.868625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
551	426.88112	416.88112
552	426.89362	416.89362
553	426.90612	416.90612
554	426.91862	416.91862
555	426.93112	416.93112
556	426.94362	416.94362
557	426.95612	416.95612
558	426.96862	416.96862
559	426.98112	416.98112
560	426.99362	416.99362
561	427.00612	417.00612
562	427.01862	417.01862
563	427.03112	417.03112
564	427.04362	417.04362
565	427.05612	417.05612
566	427.06862	417.06862
567	427.08112	417.08112
568	427.09362	417.09362
569	427.10612	417.10612
570	427.11862	417.11862
571	427.13112	417.13112
572	427.14362	417.14362
573	427.15612	417.15612
574	427.16862	417.16862
575	427.18112	417.18112
576	427.19362	417.19362
577	427.20612	417.20612
578	427.21862	417.21862
579	427.23112	417.23112
580	427.24362	417.24362
581	427.25612	417.25612
582	427.26862	417.26862
583	427.28112	417.28112
584	427.29362	417.29362
585	427.30612	417.30612
586	427.31862	417.31862
587	427.33112	417.33112
588	427.34362	417.34362
589	427.35612	417.35612
590	427.36862	417.36862
591	427.38112	417.38112
592	427.39362	417.39362
593	427.40612	417.40612
594	427.41862	417.41862
595	427.43112	417.43112
596	427.44362	417.44362
597	427.45612	417.45612
598	427.46862	417.46862
599	427.48112	417.48112
600	427.49362	417.49362

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
601	427.506125	417.506125
602	427.518625	417.518625
603	427.531125	417.531125
604	427.543625	417.543625
605	427.556125	417.556125
606	427.568625	417.568625
607	427.581125	417.581125
608	427.593625	417.593625
609	427.606125	417.606125
610	427.618625	417.618625
611	427.631125	417.631125
612	427.643625	417.643625
613	427.656125	417.656125
614	427.668625	417.668625
615	427.681125	417.681125
616	427.693625	417.693625
617	427.706125	417.706125
618	427.718625	417.718625
619	427.731125	417.731125
620	427.743625	417.743625
621	427.756125	417.756125
622	427.768625	417.768625
623	427.781125	417.781125
624	427.793625	417.793625
625	427.806125	417.806125
626	427.818625	417.818625
627	427.831125	417.831125
628	427.843625	417.843625
629	427.856125	417.856125
630	427.868625	417.868625
631	427.881125	417.881125
632	427.893625	417.893625
633	427.906125	417.906125
634	427.918625	417.918625
635	427.931125	417.931125
636	427.943625	417.943625
637	427.956125	417.956125
638	427.968625	417.968625
639	427.981125	417.981125
640	427.993625	417.993625
641	428.006125	418.006125
642	428.018625	418.018625
643	428.031125	418.031125
644	428.043625	418.043625
645	428.056125	418.056125
646	428.068625	418.068625
647	428.081125	418.081125
648	428.093625	418.093625
649	428.106125	418.106125
650	428.118625	418.118625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
651	428.131125	418.131125
652	428.143625	418.143625
653	428.156125	418.156125
654	428.168625	418.168625
655	428.181125	418.181125
656	428.193625	418.193625
657	428.206125	418.206125
658	428.218625	418.218625
659	428.231125	418.231125
660	428.243625	418.243625
661	428.256125	418.256125
662	428.268625	418.268625
663	428.281125	418.281125
664	428.293625	418.293625
665	428.306125	418.306125
666	428.318625	418.318625
667	428.331125	418.331125
668	428.343625	418.343625
669	428.356125	418.356125
670	428.368625	418.368625
671	428.381125	418.381125
672	428.393625	418.393625
673	428.406125	418.406125
674	428.418625	418.418625
675	428.431125	418.431125
676	428.443625	418.443625
677	428.456125	418.456125
678	428.468625	418.468625
679	428.481125	418.481125
680	428.493625	418.493625
681	428.506125	418.506125
682	428.518625	418.518625
683	428.531125	418.531125
684	428.543625	418.543625
685	428.556125	418.556125
686	428.568625	418.568625
687	428.581125	418.581125
688	428.593625	418.593625
689	428.606125	418.606125
690	428.618625	418.618625
691	428.631125	418.631125
692	428.643625	418.643625
693	428.656125	418.656125
694	428.668625	418.668625
695	428.681125	418.681125
696	428.693625	418.693625
697	428.706125	418.706125
698	428.718625	418.718625
699	428.731125	418.731125
700	428.743625	418.743625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
701	428.756125	418.756125
702	428.768625	418.768625
703	428.781125	418.781125
704	428.793625	418.793625
705	428.806125	418.806125
706	428.818625	418.818625
707	428.831125	418.831125
708	428.843625	418.843625
709	428.856125	418.856125
710	428.868625	418.868625
711	428.881125	418.881125
712	428.893625	418.893625
713	428.906125	418.906125
714	428.918625	418.918625
715	428.931125	418.931125
716	428.943625	418.943625
717	428.956125	418.956125
718	428.968625	418.968625
719	428.981125	418.981125
720	428.993625	418.993625
721	429.006125	419.006125
722	429.018625	419.018625
723	429.031125	419.031125
724	429.043625	419.043625
725	429.056125	419.056125
726	429.068625	419.068625
727	429.081125	419.081125
728	429.093625	419.093625
729	429.106125	419.106125
730	429.118625	419.118625
731	429.131125	419.131125
732	429.143625	419.143625
733	429.156125	419.156125
734	429.168625	419.168625
735	429.181125	419.181125
736	429.193625	419.193625
737	429.206125	419.206125
738	429.218625	419.218625
739	429.231125	419.231125
740	429.243625	419.243625
741	429.256125	419.256125
742	429.268625	419.268625
743	429.281125	419.281125
744	429.293625	419.293625
745	429.306125	419.306125
746	429.318625	419.318625
747	429.331125	419.331125
748	429.343625	419.343625
749	429.356125	419.356125
750	429.368625	419.368625

CHANNEL NUMBER	FREQUENCY (MHz)	
	Base Tx	Base Rx
751	429.38112	419.38112
752	429.39362	419.39362
753	429.40612	419.40612
754	429.41862	419.41862
755	429.43112	419.43112
756	429.44362	419.44362
757	429.45612	419.45612
758	429.46862	419.46862
759	429.48112	419.48112
760	429.49362	419.49362
761	429.50612	419.50612
762	429.51862	419.51862
763	429.53112	419.53112
764	429.54362	419.54362
765	429.55612	419.55612
766	429.56862	419.56862
767	429.58112	419.58112
768	429.59362	419.59362
769	429.60612	419.60612
770	429.61862	419.61862
771	429.63112	419.63112
772	429.64362	419.64362
773	429.65612	419.65612
774	429.66862	419.66862
775	429.68112	419.68112
776	429.69362	419.69362
777	429.70612	419.70612
778	429.71862	419.71862
779	429.73112	419.73112
780	429.74362	419.74362
781	429.75612	419.75612
782	429.76862	419.76862
783	429.78112	419.78112
784	429.79362	419.79362
785	429.80612	419.80612
786	429.81862	419.81862
787	429.83112	419.83112
788	429.84362	419.84362
789	429.85612	419.85612
790	429.86862	419.86862
791	429.88112	419.88112
792	429.89362	419.89362
793	429.90612	419.90612
794	429.91862	419.91862
795	429.93112	419.93112
796	429.94362	419.94362
797	429.95612	419.95612
798	429.96862	419.96862
799	429.98112	419.98112
800	429.99362	419.99362

APPENDIX C: CHANNEL ALLOTMENT PLAN

Block	Sub-block																			
	1		2		3		4		5		6		7		8		9		10	
A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
B	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380
	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400

Block	Sub-block																			
	1		2		3		4		5		6		7		8		9		10	
C	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520
	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540
	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560
	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580
	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
D	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800

APPENDIX D: ERLANG C TABLE

Maximum Offered Load versus B and N B is in %

N/B	0.01	0.05	0.1	0.5	1	2	5	10	15	20	30	40
1	0.0001	0.0005	0.0010	0.0050	0.0100	0.0200	0.0500	0.1000	0.1500	0.2000	0.3000	0.4000
2	0.0142	0.0319	0.0452	0.1025	0.1465	0.2103	0.3422	0.5000	0.6278	0.7403	0.9390	1.1170
3	0.0860	0.1490	0.1894	0.3339	0.4291	0.5545	0.7876	1.0400	1.2310	1.3930	1.6670	1.9030
4	0.2310	0.3533	0.4257	0.6641	0.8100	0.9939	1.3190	1.6530	1.8990	2.1020	2.4400	2.7250
5	0.4428	0.6289	0.7342	1.0650	1.2590	1.4970	1.9050	2.3130	2.6070	2.8470	3.2410	3.5690
6	0.7110	0.9616	1.0990	1.5190	1.7580	2.0470	2.5320	3.0070	3.3440	3.6170	4.0620	4.4280
7	1.0260	1.3410	1.5100	2.0140	2.2970	2.6330	3.1880	3.7250	4.1030	4.4060	4.8970	5.2980
8	1.3820	1.7580	1.9580	2.5430	2.8660	3.2460	3.8690	4.4630	4.8780	5.2100	5.7440	6.1780
9	1.7710	2.2080	2.4360	3.1000	3.4600	3.8830	4.5690	5.2180	5.6680	6.0270	6.6000	7.0650
10	2.1890	2.6850	2.9420	3.6790	4.0770	4.5400	5.2850	5.9860	6.4690	6.8530	7.4650	7.9590
11	2.6340	3.1860	3.4700	4.2790	4.7120	5.2130	6.0150	6.7650	7.2800	7.6880	8.3360	8.8570
12	3.1000	3.7080	4.0180	4.8960	5.3630	5.9010	6.7580	7.5540	8.0990	8.5300	9.2120	9.7610
13	3.5870	4.2480	4.5840	5.5290	6.0280	6.6020	7.5110	8.3520	8.9260	9.3790	10.09	10.67
14	4.0920	4.8050	5.1660	6.1750	6.7050	7.3130	8.2730	9.1580	9.7600	10.230	10.980	11.580
15	4.6140	5.3770	5.7620	6.8330	7.3940	8.0350	9.0440	9.9700	10.600	11.090	11.870	12.490
16	5.1500	5.9620	6.3710	7.5020	8.0930	8.7660	9.8220	10.790	11.440	11.960	12.770	13.410
17	5.6990	6.5600	6.9910	8.1820	8.8010	9.5050	10.610	11.610	12.290	12.830	13.660	14.330
18	6.2610	7.1690	7.6220	8.8710	9.5180	10.250	11.400	12.440	13.150	13.700	14.560	15.250
19	6.8350	7.7880	8.2630	9.5680	10.240	11.010	12.200	13.280	14.010	14.580	15.470	16.180
20	7.4190	8.4170	8.9140	10.270	10.970	11.770	13.000	14.120	14.870	15.450	16.370	17.100
21	8.0130	9.0550	9.5720	10.990	11.710	12.530	13.810	14.960	15.730	16.340	17.280	18.030
22	8.6160	9.7020	10.240	11.700	12.460	13.300	14.620	15.810	16.600	17.220	18.190	18.960
23	9.2280	10.360	10.910	12.430	13.210	14.080	15.430	16.650	17.470	18.110	19.100	19.890
24	9.8480	11.020	11.590	13.160	13.960	14.860	16.250	17.510	18.350	19.000	20.020	20.820
25	10.480	11.690	12.280	13.900	14.720	15.650	17.080	18.360	19.220	19.890	20.930	21.760
26	11.110	12.360	12.970	14.640	15.490	16.440	17.910	19.220	20.100	20.790	21.850	22.690
27	11.750	13.040	13.670	15.380	16.260	17.230	18.740	20.080	20.980	21.680	22.770	23.630
28	12.400	13.730	14.380	16.140	17.030	18.030	19.570	20.950	21.870	22.580	23.690	24.570
29	13.050	14.420	15.090	16.890	17.810	18.830	20.410	21.820	22.750	23.480	24.610	25.500
30	13.710	15.120	15.800	17.650	18.590	19.640	21.250	22.680	23.640	24.380	25.540	26.440
31	14.380	15.820	16.520	18.420	19.370	20.450	22.090	23.560	24.530	25.290	26.460	27.380
32	15.050	16.530	17.250	19.180	20.160	21.260	22.930	24.430	25.420	26.190	27.390	28.330
33	15.720	17.240	17.970	19.950	20.950	22.070	23.780	25.300	26.320	27.100	28.310	29.270
34	16.400	17.950	18.710	20.730	21.750	22.890	24.630	26.180	27.210	28.010	29.240	30.210
35	17.090	18.670	19.440	21.510	22.550	23.710	25.480	27.060	28.110	28.920	30.170	31.160
36	17.780	19.390	20.180	22.290	23.350	24.530	26.340	27.940	29.000	29.830	31.100	32.100
37	18.470	20.120	20.920	23.070	24.150	25.360	27.190	28.820	29.900	30.740	32.030	33.050
38	19.170	20.850	21.670	23.860	24.960	26.180	28.050	29.710	30.800	31.650	32.970	34.000
39	19.870	21.590	22.420	24.650	25.770	27.010	28.910	30.590	31.710	32.570	33.900	34.940
40	20.580	22.330	23.170	25.440	26.580	27.840	29.770	31.480	32.610	33.480	34.830	35.890
41	21.280	23.070	23.930	26.230	27.390	28.680	30.630	32.370	33.510	34.400	35.770	36.840
42	22.000	23.810	24.690	27.030	28.210	29.510	31.500	33.260	34.420	35.320	36.700	37.790
43	22.710	24.560	25.450	27.830	29.020	30.350	32.360	34.150	35.330	36.230	37.640	38.740

N/B	0.01	0.05	0.1	0.5	1	2	5	10	15	20	30	40
44	23.430	25.310	26.220	28.630	29.840	31.190	33.230	35.040	36.230	37.150	38.580	39.690
45	24.150	26.060	26.980	29.440	30.670	32.030	34.100	35.930	37.140	38.070	39.510	40.640
46	24.880	26.820	27.750	30.240	31.490	32.870	34.970	36.830	38.050	39.000	40.450	41.590
47	25.600	27.570	28.520	31.050	32.320	33.720	35.840	37.720	38.960	39.920	41.390	42.540
48	26.340	28.330	29.300	31.860	33.140	34.560	36.720	38.620	39.870	40.840	42.330	43.500
49	27.070	29.100	30.080	32.680	33.970	35.410	37.590	39.520	40.790	41.760	43.270	44.450
50	27.800	29.860	30.860	33.490	34.800	36.260	38.470	40.420	41.700	42.69	44.210	45.400
51	28.540	30.630	31.640	34.310	35.640	37.110	39.350	41.320	42.610	43.610	45.150	46.360
52	29.280	31.400	32.420	35.120	36.470	37.970	40.230	42.220	43.530	44.540	46.100	47.310
53	30.030	32.170	33.210	35.940	37.310	38.820	41.100	43.120	44.440	45.470	47.040	48.270
54	30.770	32.950	33.990	36.760	38.150	39.670	41.990	44.020	45.360	46.390	47.980	49.220
55	31.520	33.720	34.780	37.590	38.990	40.530	42.870	44.930	46.280	47.320	48.930	50.180
56	32.270	34.500	35.570	38.410	39.830	41.390	43.750	45.830	47.200	48.250	49.870	51.130
57	33.030	35.280	36.370	39.240	40.670	42.250	44.640	46.740	48.120	49.180	50.820	52.090
58	33.780	36.060	37.160	40.070	41.510	43.110	45.520	47.640	49.040	50.110	51.760	53.050
59	34.540	36.850	37.960	40.900	42.360	43.970	46.410	48.550	49.960	51.040	52.710	54.010
60	35.300	37.630	38.760	41.730	43.200	44.830	47.290	49.460	50.880	51.970	53.650	54.960
61	36.060	38.420	39.560	42.560	44.050	45.700	48.180	50.370	51.800	52.900	54.600	55.920
62	36.820	39.210	40.360	43.390	44.900	46.560	49.070	51.270	52.720	53.830	55.550	56.880
63	37.590	40.000	41.160	44.230	45.750	47.430	49.960	52.180	53.640	54.770	56.490	57.840
64	38.350	40.800	41.970	45.060	46.600	48.300	50.850	53.100	54.570	55.700	57.440	58.800
65	39.120	41.590	42.780	45.900	47.450	49.160	51.740	54.010	55.490	56.630	58.390	59.760
66	39.890	42.390	43.580	46.740	48.300	50.030	52.640	54.920	56.420	57.570	59.340	60.720
67	40.660	43.180	44.390	47.580	49.160	50.900	53.530	55.830	57.340	58.500	60.290	61.680
68	41.440	43.980	45.200	48.420	50.010	51.770	54.420	56.750	58.270	59.440	61.240	62.640
69	42.210	44.780	46.020	49.260	50.870	52.650	55.320	57.660	59.200	60.370	62.190	63.600
70	42.990	45.580	46.830	50.100	51.730	53.520	56.210	58.570	60.120	61.310	63.140	64.560
71	43.770	46.390	47.640	50.950	52.590	54.390	57.110	59.490	61.050	62.250	64.090	65.520
72	44.550	47.190	48.460	51.790	53.450	55.270	58.010	60.410	61.980	63.180	65.040	66.480
73	45.330	48.000	49.280	52.640	54.310	56.140	58.900	61.320	62.910	64.120	65.990	67.440
74	46.110	48.810	50.100	53.490	55.170	57.020	59.800	62.240	63.840	65.060	66.940	68.400
75	46.900	49.610	50.920	54.340	56.030	57.900	60.700	63.160	64.760	66.000	67.890	69.370
76	47.680	50.420	51.740	55.190	56.890	58.780	61.600	64.070	65.690	66.940	68.850	70.330
77	48.470	51.230	52.560	56.040	57.760	59.650	62.500	64.990	66.630	67.880	69.800	71.290
78	49.260	52.050	53.380	56.890	58.620	60.530	63.400	65.910	67.560	68.820	70.750	72.250
79	50.050	52.860	54.210	57.740	59.490	61.410	64.300	66.830	68.490	69.760	71.700	73.220
80	50.840	53.680	55.030	58.600	60.360	62.300	65.210	67.750	69.420	70.700	72.660	74.180
81	51.630	54.490	55.860	59.450	61.220	63.180	66.110	68.670	70.350	71.640	73.610	75.140
82	52.430	55.310	56.690	60.300	62.090	64.060	67.010	69.590	71.280	72.580	74.570	76.110
83	53.220	56.130	57.520	61.160	62.960	64.940	67.920	70.520	72.220	73.520	75.520	77.070
84	54.020	56.950	58.350	62.020	63.830	65.830	68.820	71.440	73.150	74.460	76.470	78.040
85	54.810	57.770	59.180	62.880	64.700	66.710	69.730	72.360	74.080	75.400	77.430	79.000
86	55.610	58.590	60.010	63.730	65.570	67.600	70.630	73.280	75.020	76.350	78.380	79.970
87	56.410	59.410	60.840	64.590	66.450	68.480	71.540	74.210	75.950	77.290	79.340	80.930
88	57.210	60.230	61.670	65.450	67.320	69.370	72.450	75.130	76.890	78.230	80.300	81.900
89	58.020	61.060	62.510	66.320	68.190	70.260	73.350	76.060	77.820	79.180	81.250	82.860
90	58.820	61.880	63.340	67.180	69.070	71.150	74.260	76.980	78.760	80.120	82.210	83.830

N/B	0.01	0.05	0.1	0.5	1	2	5	10	15	20	30	40
91	59.620	62.710	64.180	68.040	69.940	72.040	75.170	77.910	79.690	81.060	83.160	84.790
92	60.430	63.540	65.020	68.900	70.820	72.920	76.080	78.830	80.630	82.010	84.120	85.760
93	61.230	64.360	65.860	69.770	71.700	73.810	76.990	79.760	81.570	82.950	85.080	86.730
94	62.040	65.190	66.700	70.630	72.570	74.710	77.900	80.690	82.500	83.900	86.030	87.690
95	62.850	66.020	67.540	71.500	73.450	75.600	78.810	81.610	83.440	84.840	86.990	88.660
96	63.660	66.850	68.380	72.360	74.330	76.490	79.720	82.540	84.380	85.790	87.950	89.620
97	64.470	67.690	69.220	73.230	75.210	77.380	80.630	83.470	85.320	86.740	88.910	90.590
98	65.280	68.520	70.060	74.100	76.090	78.270	81.540	84.390	86.260	87.680	89.870	91.560
99	66.090	69.350	70.900	74.970	76.970	79.170	82.460	85.320	87.200	88.630	90.820	92.530
100	66.910	70.190	71.750	75.840	77.850	80.060	83.370	86.250	88.130	89.580	91.780	93.490

APPENDIX E:

**LIST OF ANALOGUE TRS SERVICE PROVIDERS IN THE 800MHz BAND & THE
NUMBERS OF AA HELD (EXTRACTED FROM SRSP 502M) at the
IMPLEMENTATION OF INBAND MIGRATION TO DIGITAL IN JULY 2006**

Client Name	Northern	Eastern	Central	Southern	Sabah	Sarawak	Grand Total
A CHI J A Y A COMMUNICATIONS SDN BHD						44	44
CMRS TRUNK RADIO SDN. BHD.	17	6	49				72
COMETRON SDN.BHD.			25	43			68
ELECTCOMS SDN BHD	233	170	235	142	3	6	789
HASYON TEKNIK SDN. BHD.	15		40	5			60
MAL-TEL COMMUNICATION SDN BHD	10		39				49
PAGER COMMUNICATION SDN. BHD.		30					30
SAMEN TRUNK RADIO SDN. BHD.	5	8	34	30			77
SEGI MAJU SDN BHD	22	24	50	34			130
STARS ASSOCIATED SDN BHD		2	4		13	39	58
STR COMMUNICATION SDN BHD	10	10	5				25
SYARIKAT PELATUS SDN BHD	9	14	93				116
TEXTPHON (M) SDN. BHD.	31	13	17	14			75
WIDENET DISTRIBUTOR SDN BHD	55	30	10	35			130
Grand Total	407	307	601	303	16	89	1723

APPENDIX F:

CONDITIONS OF AA

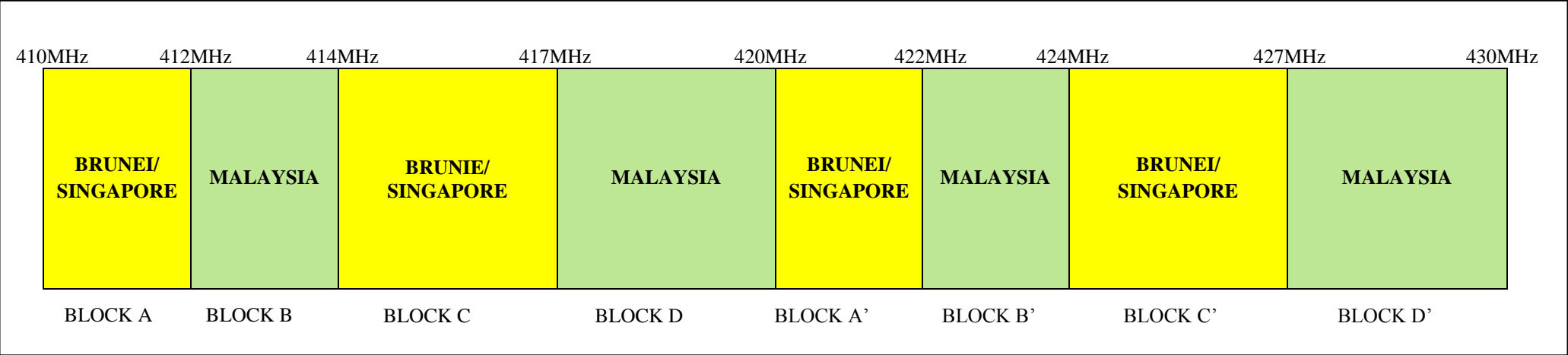
The issuance of the AA in the frequency bands in Blocks A, B and C shall be subject to the following conditions:

- (a) that the AA issued shall be cancelled upon the cancellation of the Network Facility Provider Individual Licence of the AA holder;
- (b) that the AA issued shall be suspended upon the suspension of the Network Facility Provider Individual Licence of the AA holder;
- (c) that AA holder shall comply with the Detailed Business Plan submitted to the Commission *in toto* unless modified with the approval of the Commission;
- (d) that there shall be no change in the shareholding of Network Facility Provider Individual Licence holder for a period of five years from the date of issuance of the first AA to the licensee;
- (e) that Network Facility Provider Individual Licence holder shall submit a half yearly report to the Commission outlining the steps taken to implement the Detailed Business Plan as at **30 June** and **31 December** of each year;
- (f) that the performance bond submitted to the Commission shall be valid for the period of the AA; and
- (g) that the Commission is entitled to call on the guarantee provided pursuant to paragraph 6.2.1.2.3 of the SKMM SRSP-537 by the AA holder in the event of non-compliance of the terms and conditions of the AA. The right of the Commission to call on the guarantee is without prejudice to its right to take relevant action against the AA holder under the Act and subsidiary legislation made under it.

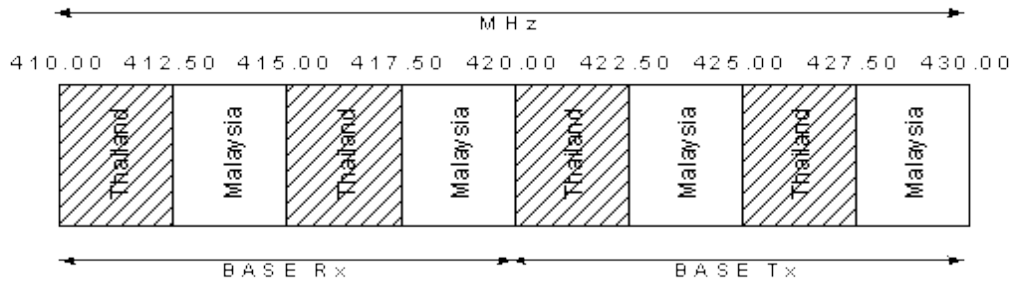
APPENDIX G: DEFINED GEOGRAPHIC AREA

Area	Geographic Blocks
1	Peninsular Malaysia
2	Sabah and Wilayah Persekutuan Labuan
3	Sarawak

APPENDIX H: SPECTRUM ALLOCATION FOR DIGITAL TRUNKED RADIO (MALAYSIA /BRUNEI/SINGAPORE)



**APPENDIX I: SPECTRUM ALLOCATION FOR DIGITAL TRUNKED RADIO
(MALAYSIA /THAILAND)**



Maximum permissible level of interference agreed with Thailand for UHF PMR services:

1. Signal strength of -85 dBm; measured at 5 km from the border at 1.5 m above the ground level
2. C/I value of 18 dB

APPENDIX J: INTERFERENCE RESOLUTION PROCESS

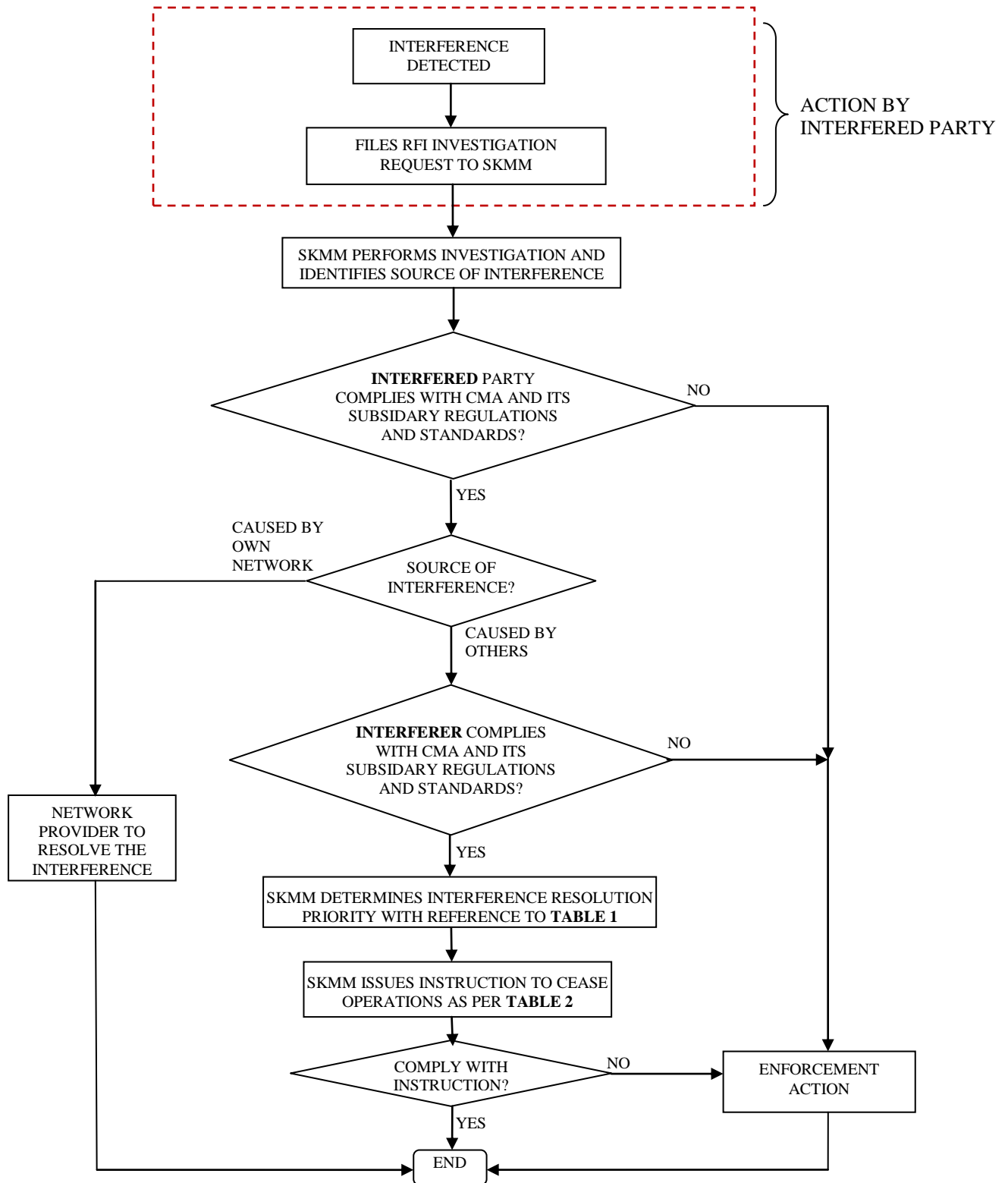


TABLE 1: INTERFERENCE RESOLUTION PRIORITY

	Resolution Type of Priority	Description
1	Service Priority	Primary has priority over secondary services. Among co- primary or co-secondary services, the stated priority is accorded as in the Spectrum Plan
2	Assignment Type Priority	Spectrum Assignment (SA) and Apparatus Assignment (AA) have equal priority but are of higher priority than Class Assignment (CA)
3	Service Type Priority	In the event where service priority and assignment type priority are equal for affected parties, the following list will determine the priority level for the interference case (the earlier in the list is given higher priority): <ul style="list-style-type: none"> i. Safety or Radionavigation service; ii. Based on the Date of Apparatus Assignment - Priority is given to the earliest/first installation

TABLE 2: INTERFERENCE RESOLUTION TIMELINE TO PARTIES

	Types of interference	Description	Resolution Timeline
1	Harmful	Interference which endangers or seriously degrades, obstructs or repeatedly interrupts the functioning of a radionavigation service or one or more safety services operating in accordance with CMA (Spectrum) Regulations 2000	To cease* operation immediately within 24 hours or earlier as specified in the notice issued by SKMM
2	Major	Electromagnetic interference rendering any apparatus or services unsuitable for their intended purpose. For this purpose interference to public correspondence service is considered under this category	To cease* operation within 3 days or earlier as specified in notice issued by SKMM if interference cannot be resolved.
3	Minor	Electromagnetic interference which does not affect the overall operation of any radiocommunications transmission.	To cease* operation within 7 days or earlier as specified in the notice issued by SKMM if interference cannot be resolved

*Note:

Resumption of operation of the apparatus is not allowed unless the assignment holder submit interference resolution or mitigation plan and complete implementation of the mitigation plan to the satisfaction of SKMM to remove/ avoid the interference.