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GENERAL ASPECTS

XXX, ZZZ

PROPOSED MODIFICATIONS TO ITU-R M.1036

1 Introduction

Globally harmonized spectrum and harmonized frequency arrangements for IMT are desirable to reduce the overall cost of IMT networks and terminals by providing economies of scale and facilitating deployment and cross-border coordination. An early guidance on the recommended frequency arrangements for the bands identified for IMT, will be very helpful to administrations to carry out spectrum planning. Further, access to harmonized spectrum is expected to have a significant impact on the cost of providing mobile broadband along with having economic benefits such as jobs and growth and social benefits like E-Health, M-Government and providing education services.

Recommendation ITU R M.1036 provides various alternatives for deployments in various frequency bands depending on local/regional conditions in order to provide flexibility for different conditions. It is therefore essential that Recommendation ITU R M.1036-6 be updated timely to support administrations.

2 Proposal

XXX proposes that the 42nd meeting of WP5D considers a revision to Recommendation ITU-R M.1036-6 as provided (**highlighted**) in Section 3 in the Annexure 1. It may be noted that 3GPP has identified the spectrum band 663-703/612-652 MHz as Band n105.

Further, to ensure timely availability of the necessary information, it is also proposed to focus the next and future revisions of Recommendation ITU-R M.1036 purely on the recommended frequency arrangements while separating the implementation aspects into a separate ITU-R Recommendation.

**Frequency arrangements for implementation of the terrestrial component
of International Mobile Telecommunications in the bands
identified for IMT in the Radio Regulations**

(Question ITU-R 229-5/5)

(1994-1999-2003-2007-2012-2015-2019)

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Annex

Implementation aspects and frequency arrangements applicable for IMT

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SECTION 3

Frequency arrangements in the 470-960 MHz frequency range

The recommended frequency arrangements for implementation of IMT in the band 470-960 MHz are summarized in Table 2 and in Fig. 3, noting the implementation aspects in Section 1 above.

TABLE 2

Frequency arrangements in the 610-960 MHz frequency range

Frequency arrangements	Paired arrangements (FDD)				Un-paired arrangements (TDD) (MHz)
	Mobile station transmitter (MHz)	Centre gap (MHz)	Base station transmitter (MHz)	Duplex separation (MHz)	
A1	824-849	20	869-894	45	None
A2	880-915	10	925-960	45	None
A3	832-862	11	791-821	41	None
A4	698-716	12	728-746	30	716-728
	776-793	13	746-763	30	
A5	703-748	10	758-803	55	None
A6					698-806
A7	703-733	25	758-788	55	None

A8	698-703	50	753-758	55	None
A9	733-736	52	788-791	55	None
A10	External		738-758		None
A11 (harmonized with A7 and A10)	703-733 External	25	758-788 738-758	55	None
A12	663-698	11	617-652	46	None
A13	663-703	11	612-652	51	None

Notes to Table 2:

Note 1: In A3, IMT systems are operating in FDD mode and use a reversed duplex direction, with mobile terminal transmit within the upper band and base station transmit within the lower band. Such an arrangement provides better conditions for coexistence with the lower adjacent broadcasting service. It is noted that Administrations which do not wish to use this plan or which do not have the full band 790-862 MHz available may consider other frequency arrangements including, e.g. partial implementation of frequency arrangement described in A3, a TDD frequency arrangement (with a guardband of at least 7 MHz above 790 MHz) or a mixed introduction of TDD and FDD frequency arrangements.

Note 2: In A4, administrations can use the band solely for FDD or TDD, or some combination of FDD and TDD. Administrations can use any FDD duplex spacing or FDD duplex direction. However, when administrations choose to deploy mixed FDD/TDD channels with a fixed duplex separation for FDD, the duplex separation and duplex direction as shown in A4 are preferred. Individual band blocks in the mixed channel arrangement may include further subdivisions to accommodate both duplex methods.

Note 3: The frequency arrangements for the band 698-960 MHz have been developed taking into consideration the *recognizing* above. The frequency arrangements for PPDR systems using IMT technologies in the bands identified in Resolution **646 (Rev. WRC-19)**, are outside the scope of this Recommendation and are covered by Recommendation ITU-R M.2015. There are inherent benefits of deploying IMT technologies for PPDR applications in this band, including advantages of large coverage area and possible interoperability across the 700 and 800 MHz bands, noting the differences in operational requirements and implementations.

Note 4: In A5, 2 × 45 MHz FDD arrangement is implemented by using sub-blocks with dual duplexer solution and conventional duplex arrangement. Internal guardbands of 5 MHz and 3 MHz are provided at the lower and upper edge of the band for better co-existence with adjacent radiocommunication services.

Note 5: In A6, taking into account the external 4 MHz guardband (694-698 MHz), a minimum internal guardband of 5 MHz at the lower edge (698 MHz) and 3 MHz at the upper edge (806 MHz) needs to be considered.

Note 6: The frequency arrangement in A7 aligns with the lower duplexer from A5.

Note 7: Administrations can implement the A8 arrangement alone or in combination with parts of A7 (e.g. UL: 698-718/DL: 753-773 MHz), provided that coexistence with the services below 694 MHz is ensured.

Note 8: The frequency arrangement in A9 aligns with part of the upper duplexer of A5.

Note 9: For A10 and A11, zero to four frequency blocks of 5 MHz in 738-758 MHz could be used to complement the downlink capacity of a frequency arrangement in this or other bands.

Note 10: For administrations having implemented the A7 arrangement, this arrangement can be combined with the A10 arrangement, i.e. A11.

Note 11: The frequency arrangement A12 and A13 is based on a reverse FDD configuration. This will guarantee compatibility with A5 arrangement since upper A12/A13 block and lower A5 block will be both transmitting in uplink direction.

Note 12: The frequency arrangement A12 and A13 may not align with the channelization schemes of other services in all regions.

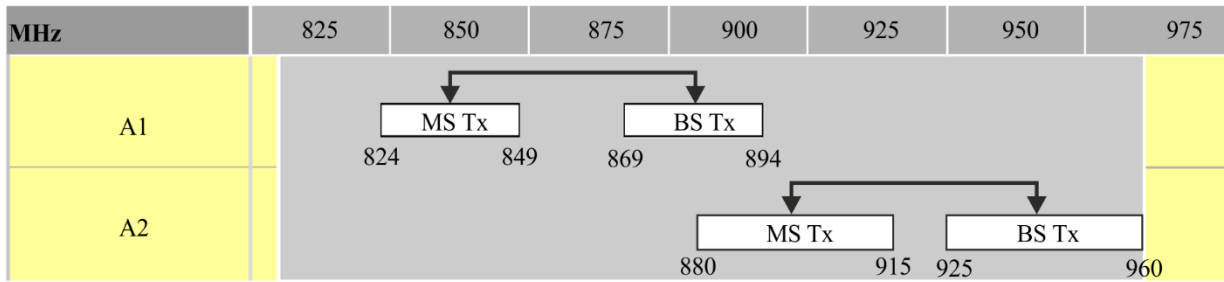
FIGURE 3

Frequency arrangements A1 to A13
(see Notes to Table 2)

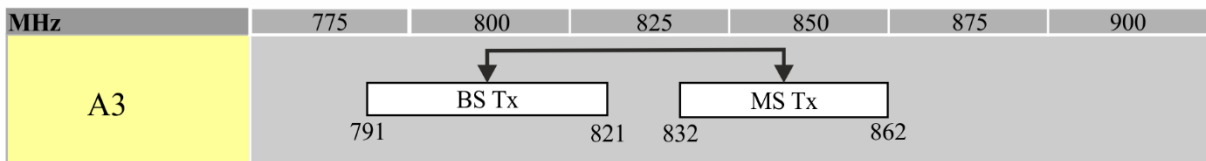
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Arrangements A1 and A2

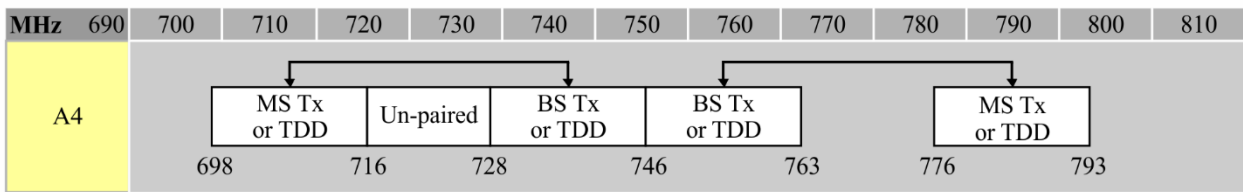
Arrangements A1, A2



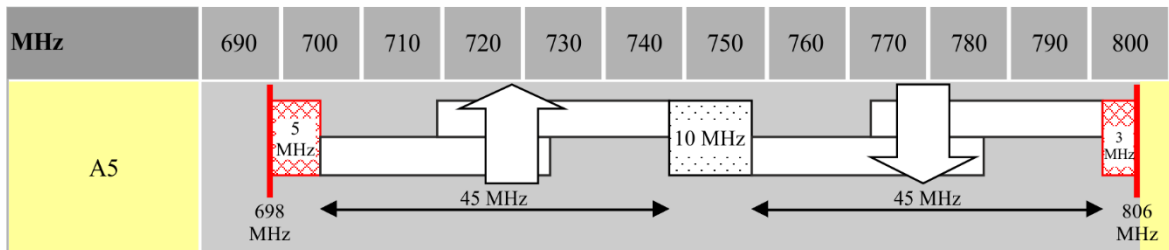
Arrangement A3



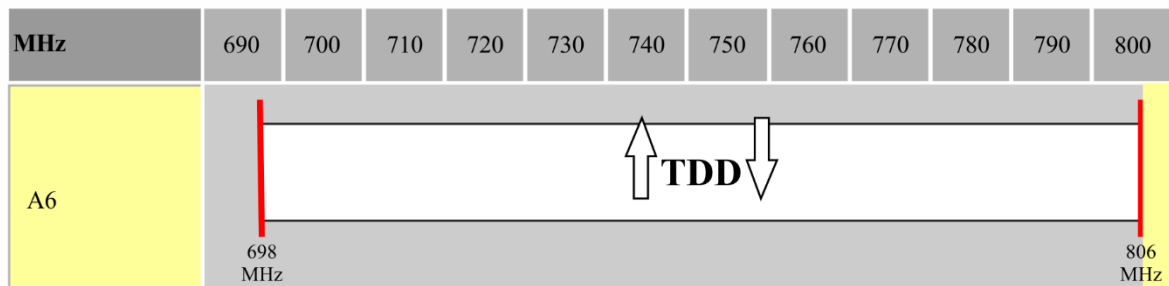
Arrangement A4



Arrangement A5



Arrangement A6



Arrangement A7

MHz	690	700	710	720	730	740	750	760	770	780	790	800
A7	[Grey bar]											
	MS Tx				BS Tx							
	703			733			758			788		

Arrangement A8

MHz	690	700	710	720	730	740	750	760	770	780	790	800
A8	[Grey bar]											
	MS Tx							BS Tx				
	698 703							753 758				

Arrangement A9

MHz	690	700	710	720	730	740	750	760	770	780	790	800
A9	[Grey bar]											
					MS Tx						BS Tx	
					733 736						788 791	

Arrangement A10

MHz	690	700	710	720	730	740	750	760	770	780	790	800
A10	[Grey bar]											
						BS Tx						
						738			758			

Arrangement A11

MHz	690	700	710	720	730	740	750	760	770	780	790	800
A11	[Grey bar]											
	MS Tx					BS Tx		BS Tx				
	703			733 738		758			788			

Arrangement A12

MHz	610	620	630	640	650	660	670	680	690
A12	[Grey bar]								
	BS Tx				MS Tx				
	617				652		663		698

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Arrangement A13

MHz	610	620	630	640	650	660	670	680	690	700	710
A13											
	BS Tx					MS Tx					
	612					652	663				

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