

REPORT ITU-R M.2082

**Modifications of Appendix 17 of the Radio Regulations (Frequencies and channelling arrangements in the high-frequency bands for the maritime mobile service) for a possible solution of agenda item 1.13
(Resolution 351 (WRC-03))**

(2006)

1 Introduction

This complex agenda item is composed of four parts:

Resolution 729 (WRC-97) (Issues A and B): This Resolution calls for a review of frequency adaptive techniques for fixed and mobile services in the MF and HF bands. Two separate issues are addressed in the CPM text as Issues A and B (*resolves* 2 and 3 respectively). Issue A addresses the need to automatically limit simultaneous use of frequencies to the minimum necessary. Issue B addresses the need to evaluate the channel occupancy prior to and during operation, with a view to avoiding unintentional harmful interference.

Resolution 351 (WRC-03) (Issue C): This Resolution calls for a review of the frequency and channel arrangements for the maritime mobile service in the MF and HF bands. Particularly, this review addresses Appendix 17 of Radio Regulations (RR) with a view to improving efficiency by considering the use of new digital technology by the maritime mobile service.

Resolution 544 (WRC-03) (Issue D): This Resolution addresses the identification of additional spectrum for the broadcasting service in the HF bands. It specifically notes a spectrum deficiency of at least 250 kHz, up to 800 kHz, for the broadcasting service in bands below 10 MHz.

Review of Allocations (Issue E): The task for this issue is to review the allocations to all services in the frequency range 4-10 MHz, except those that are excluded, with a view to addressing those issues outside of Resolutions 729 (WRC-97), 351 (WRC-03) and 544 (WRC-03) and those elements where the resolutions are interrelated. There is a difference of opinion on the scope of this issue.

In accordance with Resolution 351 (WRC-03), the maritime community is asked to consider the use of new digital technology in the maritime mobile service (MMS) in the MF and HF bands. Resolution 351 also cites that the need to use new digital technologies in the MMS is growing rapidly, and that the use of new digital technology on MF and HF frequencies allocated to the MMS will make it possible to better respond to the emerging demand for new maritime services. It is also noted that WRC-03 has modified Appendix 17 to permit on a voluntary basis, the use of various channels or bands for initial testing and future introduction of new digital technology. Resolution 351 (WRC-03) points out that the HF bands allocated to the MMS for AIA Morse telegraphy and narrow-band direct-printing are significantly under-utilized. This Report addresses the intention of Resolution 351 to provide for new digital services, full worldwide interoperability of equipment on ships, and the need for one technology, or more than one interoperable worldwide technology, implemented within Appendix 17.

This Report presents candidate changes to Appendix 17 to accommodate current/legacy and the new HF digital data services.

2 Discussion

The modifications to Appendix 17 to accommodate new digital technology presented in this Report do not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the MMS. Implementation of the modifications will not disrupt safety and distress communications in the MF and HF bands. This Report details how digital technologies can be introduced by way of modifications to Appendix 17 while ensuring compliance with safety and distress communication requirements.

The following principles are used in the revision of Appendix 17 to accommodate HF data services:

- All changes are aimed at a more efficient use of the spectrum to accommodate the increased demand for spectrum to support the growing data services while recognizing the rapid decline in the demand for analogue voice and narrow-band direct-printing (NBDP) services.
- Global Maritime Distress and Safety System (GMDSS) frequencies are protected.
- Maritime safety information (MSI) frequencies are protected.
- NBDP frequencies for area A-4 are retained.
- Adequate frequencies for residual analogue voice services retained.
- Original channel numbers have been retained. This will minimize administrative tasks and also the need for shipboard equipment re-configuration.
- The outer limits of the appendix are not changed.
- The reorganization provides for 3 kHz bandwidth channelized duplex frequencies, wider bandwidths in both duplex and simplex, and also bandwidths narrower than 3 kHz. Some services make use of the narrower bandwidths for broadcast purposes and signalling channels.
- Where A-25 duplex channels are shared between maritime analogue voice services and maritime digital data services, transmissions by coast stations and ships stations should commence only when both frequencies are heard to be clear. That is, “listen before transmit” technology should be used in order to reduce the possibility of interference.

The changes based on the above bullet points are described in Annex 1 through an exhaustive list of the future segmentation inside Appendix 17.

3 Conclusions

Administrations are encouraged to take this Report into account when developing World Radiocommunication Conference (WRC) proposals on modifications to Appendix 17.

Annex 1

Summary table of Appendix 17 modifications

**Table of frequencies (kHz) to be used in the band between 4 000 kHz and 27 500 kHz
allocated exclusively to the maritime mobile service**

	Current description in Appendix 17	Current allocation (kHz)	Proposed allocation (kHz)	Sector ID (for reference)	Paired ID (duplex channels)	Proposed new description	Appendix 15 (kHz)
1	Frequencies assignable to ship stations for oceanographic data transmission c)	4 063 to 4 065		4-1		<i>Ship and coast data simplex</i>	
2	Frequencies assignable to ship stations for telephony, duplex operation a) i)	4 065 to 4 146	4 065-4 116 4 116-4 137 4 137-4 146	4-2 4-3 4-4	4-21 4-22 4-23	<i>Ship data and telephony duplex (Ch. 401-418) Ship telephony duplex (Ch. 419-423) p) Ship data and telephony duplex (Ch. 424-429)</i>	4 125
3	Frequencies assignable to ship stations and coast stations for telephony, simplex operation a)	4 146 to 4 152				<i>NOC</i>	
4	Frequencies assignable to ship stations for wide-band telegraphy, facsimile and special transmission systems	4 152 to 4 172		4-6		<i>Ship data simplex (unspecified bandwidth)</i>	
5	Frequencies (paired) assignable to ship stations for narrow-band direct-printing (NBDP) telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK d) j) m) p)	4 172 to 4 181.75	4 172-4 175 4 175-4 177 4 177.5 4 178-4 181.5	4-7 4-8 4-9 4-10		<i>Ship NBDP (Ch. 401-405) Ship and coast data simplex NBDP ship and coast distress/safety (Ch. 411) Ship and coast data simplex</i>	4 177.5
6	Calling frequencies assignable to ship stations for A1A or A1B Morse telegraphy g) p)	4 181.75 to 4 186.75		4-11		<i>Ship data simplex (unspecified bandwidth)</i>	

	Current description in Appendix 17	Current allocation (kHz)	Proposed allocation (kHz)	Sector ID (for reference)	Paired ID (duplex channels)	Proposed new description	Appendix 15 (kHz)
7	Working frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>e) f) h) p)</i>	4 186.75 to 4 202.25	4 181.75-4 202.25	4-12		Ship data simplex (unspecified bandwidth)	
8	Frequencies (non-paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK and for A1A or A1B Morse telegraphy (working) <i>b) p)</i>	4 202.75 to 4 207.25	4 202.75-4 207.25	4-13		Ship and coast data simplex	
9	Frequencies assignable to ship stations for digital selective calling <i>k) l)</i>	4 207.25 to 4 209.25		4-14		NOC	4 207.5
10	Frequencies (paired) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) n) o) p)</i>	4 209.25 to 4 219.25	4 209.5 4 210 4 210.25-4 213 4 213-4 219.25	4-15 4-16 4-17 4-18	4-7	NAVTEX broadcast MSI broadcast Coast NBDP (Ch. 401-405) Ship data simplex (unspecified bandwidth)	4 209.5 4 210
11	Frequencies assignable to coast stations for digital selective calling <i>l)</i>	4 219.25 to 4 221		4-19		NOC	
12	Frequencies assignable to coast stations for wide-band and A1A or A1B Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems	4 221 to 4 351		4-20		Coast data simplex (unspecified bandwidth)	
13	Frequencies assignable to coast stations for telephony, duplex operation <i>a)</i>	4 351 to 4 438	4 351-4 408 4 408-4 429 4 429-4 438	4-21 [4-22] [4-23]	4-2 [4-3] [4-4]	Coast data and telephony duplex (Ch. 401-418) Coast telephony duplex (Ch. 419-423) Coast data and telephony duplex (Ch. 424-429)	4 417

	Current description in Appendix 17	Current allocation (kHz)	Proposed allocation (kHz)	Sector ID (for reference)	Paired ID (duplex channels)	Proposed new description	Appendix 15 (kHz)
14	Frequencies assignable to ship stations for telephony, duplex operation <i>a) i)</i>	6 200 to 6 224	6 200-6 206 6 200-6 212 6 212-6 221 6 221-6 224	6-1 6-2 6-3	6-21 6-22 6-23	Ship telephony duplex (Ch. 601-602) Ship data and telephony duplex (Ch. 603-604) Ship telephony duplex (Ch. 605-607) Ship data and telephony duplex (Ch. 608)	6 215
15	Frequencies assignable to ship stations and coast stations for telephony, simplex operation <i>a)</i>	6 224 to 6 233		6-4		NOC	
16	Frequencies assignable to ship stations for wide-band telegraphy, facsimile and special transmission systems	6 233 to 6 261	6 233-6 261	6-5		Ship data simplex (unspecified bandwidth)	
17	Frequencies assignable to ship stations for oceanographic data transmission <i>c)</i>	6 261 to 6 262.75	6 261-6 262.75	6-6		Ship data simplex (unspecified bandwidth)	
18	Frequencies (paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) j) m) p)</i>	6 262.75 to 6 275.75	6 262.75-6 266.25 6 266-6 267.75 6 267.75-6 268.25 6 268.25-6 275.75	6-7 6-8 6-9 6-10	6-17	Ship duplex NBDP (Ch. 601-607) Ship and coast data simplex Ship and coast data NBDP Ship and coast data simplex	6 268
19	Calling frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>g) p)</i>	6 275.75 to 6 280.75	6 275.75-6 280.75	6-11		Ship data simplex (unspecified bandwidth)	
20	Frequencies (paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) m) p)</i>	6 280.75 to 6 284.75	6 280.75-6 284.75	6-12		Ship data simplex (unspecified bandwidth)	

	Current description in Appendix 17	Current allocation (kHz)	Proposed allocation (kHz)	Sector ID (for reference)	Paired ID (duplex channels)	Proposed new description	Appendix 15 (kHz)
21	Working frequencies assignable to ship stations for A1A or A1B Morse telegraphy <i>e) f) h) p)</i>	6 284.75 to 6 300.25	6 284.75-6 300.25	6-13		<i>Ship data simplex (unspecified bandwidth)</i>	
22	Frequencies (non-paired) assignable to ship stations for NBDP telegraphy and data transmission systems at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK and for A1A or A1B Morse telegraphy (working) <i>b) p)</i>	6 300.25 to 6 311.75	6 300.25-6 311.75	6-14		<i>Ship data simplex (unspecified bandwidth)</i>	
23	Frequencies assignable to ship stations for digital selective calling <i>k) l)</i>	6 311.75 to 6 313.75	6 311.75-6 313.75	6-15		NOC	6 312
24	Frequencies (paired) assignable to coast stations for NBDP and data transmission systems, at speeds not exceeding 100 Bd for FSK and 200 Bd for PSK <i>d) n) o) p)</i>	6 313.75 to 6 330.75	6 314 6 314.25-6 317.75 6 317.75-6 330.5	6-16 6-17 6-18	6-7	MSI broadcast <i>Coast duplex NBDP (Ch. 601-607) Coast and ship data simplex (unspecified bandwidth)</i>	6 314
24	Frequencies assignable to coast stations for digital selective calling <i>l)</i>	6 330.75 to 6 332.5	6 330.75-6 332.5	6-19		NOC	
25	Frequencies assignable to coast stations for wide-band and A1A or A1B Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems	6 332.5 to 6 501	6 332.5-6 501	6-20		<i>Coast data simplex (unspecified bandwidth)</i>	
25	Frequencies assignable to coast stations for telephony, duplex operation <i>a)</i>	6 501 to 6 525	6 501-6 507 6 507-6 513 6 513-6 519 6 519-6 525	6-21 6-22 6-23	6-1 6-2 6-3	<i>Coast telephony duplex (Ch. 601-602) Coast data and telephony duplex 3 kHz bandwidth (Ch. 603-604) Coast telephony duplex (Ch. 605-607) Coast data and telephony duplex (Ch. 608)</i>	6 516