European Radiocommunications Committee (ERC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

THE USE OF THE FREQUENCY BAND 3155 - 3400 KHZ FOR GENERAL INDUCTIVE APPLICATIONS

Vilnius, June 2000

INDEX TABLE

THE USE OF THE FREQUENCY BAND 3155 - 3400 KHZ FOR GENERAL INDUCTIVE APPLICATIONS

1 INTRODUCTION

In the Table of Frequency Allocations in the ITU Radio Regulations footnote S5.116 urges administrations to authorise the use of the band 3155 - 3195 kHz for a common worldwide channel for low power wireless hearing aids. Additional channels for these devices may be assigned in the bands between 3155 and 3400 kHz.

In practice use of frequencies, centered around 3.25 MHz, has been seen for anti-theft and identification devices. Also the frequency bands 1.7 - 2.0 and 2.0 - 2.2 MHz has been used for anti-theft devices. The latter bands are less suited for use by SRD‘s because of risks of interference to the primary radio services, including GMDSS. As there are no bands between 135 kHz and 6.78 Mhz assigned for SRD‘s in the ERC Recommendation 70-03, the band 3155 - 3400 kHz can fill this gap and take over some of the use of the frequencies between 1.7 and 2.2 MHz.

Concluding, it is proposed that the band 3155 - 3400 kHz be included in the ERC Recommendation 70-03 for use by hearing aid devices and more generally SRD's/inductive systems.

2 RISKS OF INTERTERFERENCE TO PRIMARY USERS

The primary radio services in the band 3155 - 3400 kHz including their protection data are:

Service:	**Fixed**	**Mobile**, except aeronautical mobile	**Broadcasting** in the tropical zone	
Victim rx bandwidth	2.7	2.7	5	kHz
Protected signal level	20	not available	37.5	dBµV/m
Minimal SNR	12	not available	34	dB
Permissible interference level (in rx bandwidth)	8		3.5	dBµV/m

Table 2.1

The noise levels for the band 3155 - 3400 kHz are:

Atmospheric noise level (80%):	6 dBµV/m.
Manmade noise level rural:	1 dBµV/m.
Manmade noise level commercial:	11 dBµV/m.

Table 2.2

The interference range is calculated according the propagation model in the ERC Report 069 for a field strength limit of 13.5 dBµA/m@10m, assuming groundwave progagation. Four numbers are given: no building screening/ 5 dB building screening, each divided in narrow band interferer and wideband interferer. As type of ground medium dry ground is assumed, it results in $E_{asymptote,40}$ = 97 dBµV/m for this frequency band.

In the table 2.3 below the values given are the distances from the interferer for which the interference does not exceed the levels mentioned in tables 2.1 and 2.2.

Service	No building screening		5 dB building screening	
	Narrow m	**Wide** m	**Narrow** m	**Wide** m
Fixed				
Limitation:				
Permissible interference level	682	505	512	379
Atmospheric noise	766	567	574	425
Manmade noise rural	1021	756	766	567
Manmade noise commercial	574	425	430	319
Mobile, except aeronautical mobile				
Limitation:				
Permissible interference level	no data available for calculation of ranges.			
Atmospheric noise	766	567	574	425
Manmade noise rural	1021	756	766	567
Manmade noise commercial	574	425	430	319
Broadcasting in the tropical zone				
Limitation:				
Permissible interference level	884	763	663	572
Atmospheric noise	656	567	492	425
Manmade noise rural	875	756	656	567
Manmade noise commercial	492	425	369	319

Table 2.3

2.1 Victim receiver bandwidth and permissible interference level

For a number of services a minimum signal level is known (Signal to be protected). Also a minimum Signal to Interference Ratio is known for those services, so from these parameters a maximum interference level can be deduced.
As the interference level is measured with a measuring receiver using the CISPR-16 Quasi-Peak method including a defined measuring bandwidth (200 Hz/9 kHz) a correction factor for the ratio of the bandwidth of the measuring receiver to the bandwidth of the victim receiver must be added to the permissible interference level in case the interference is of a wideband nature: the (flat) spectrum of the interfering signal is wider than both the bandwidth of the measuring receiver and of the victim receiver.

2.2 Broadcasting in the tropical zone

RR30 No. 2668 § 2. (1) contains the following definition:
"In these Regulations, the expression "broadcasting in the Tropical Zone" indicates a type of broadcasting for *internal national use* in countries in the zone defined in Nos. **S5.16** to **S5.20** and **S5.21**, where it may be shown that because of the difficulty of high atmospheric noise level and propagation it is not possible to provide economically service by using low, medium, or very high frequencies."

S5.16 (1) The "Tropical Zone" (see map in No. **S5.2**) is defined as:
S5.17 *a)* the whole of that area in Region 2 between the Tropics of Cancer and Capricorn;
S5.18 *b)* the whole of that area in Regions 1 and 3 contained between the parallels 30° North and 35° South with the addition of:
S5.19 1) The area contained between the meridians 40° East and 80° East of Greenwich and the parallels 30° North and 40° North.
S5.20 2) that part of Libya north of parallel 30° North.
S5.21 (2) In Region 2, the Tropical Zone may be extended to parallel 33° North, subject to special agreements between the countries concerned in that Region (see Article **7/S6**).

Except for the Canary Islands and the most eastern part of Turkey, the conclusion can be made from the above definitions of the tropical zone and the intended domestic use, that the Broadcasting service does not need to be considered.

2.3 Additional remarks

The receivers of the fixed service and of the mobile service are at special sites, or are moving.
The number of receivers is low.
In the band 3155 - 3400 kHz there are no frequencies assigned for the GMDSS.

2.4 Risks of interference from SRD‘s / inductive systems to primary services

With the exception of the Canary Islands and the most eastern part of Turkey there is not a wide spread of receiving stations in the band 3155 - 3400 kHz which need protection, so the likelyhood of harmful interference, caused by SRD‘s / inductive systems, is very low.

3 RISKS OF INTERFERENCE FROM PRIMARY SERVICES TO SRD‘S / INDUCTIVE SYSTEMS

Also interference from the primary services to the SRD‘s / inductive systems in this frequency band is not likely because no strong or nearby radio transmitters are in this band, except on the Canary Islands and the most eastern part of Turkey, where one or more local broadcasting transmitters may be situated.

4 APPLICATION

The use of the band 3155 - 3400 kHz is for SRD's/inductive systems in general. Applications may be hearing aid devices, anti-theft equipment, identification systems, close-in datalinks / micro-LAN, toys, etc.

5 CONCLUSION

It is not expected for SRD's/inductive systems in the band 3155 - 3400 kHz to cause some interference if the carrier limit from EN 300 330 (i.e. 13.5 dBµA/m at a measuring distance of 10 m) applies.
Concluding, it is proposed that the band 3155 - 3400 kHz be included in the ERC Recommendation 70-03 for use by hearing aid devices and more generally SRD's/inductive systems.