Annex 3 A

Determination of the correction factor for the permissible interference field strength at different nominal frequencies in the Land Mobile Service

1. Determination of the correction factor for the permissible interference field strength at different nominal frequencies in the Land Mobile Service

The correction factor for the permissible interfering field strength at different nominal frequencies of the transmitting channel causing the interference and the receiving channel experiencing is determined by means of the following tables and curves.

Although these curves are measured with a Speech Replacement Signal Interference (ITU-T G.227) they shall be used for all modulation types.

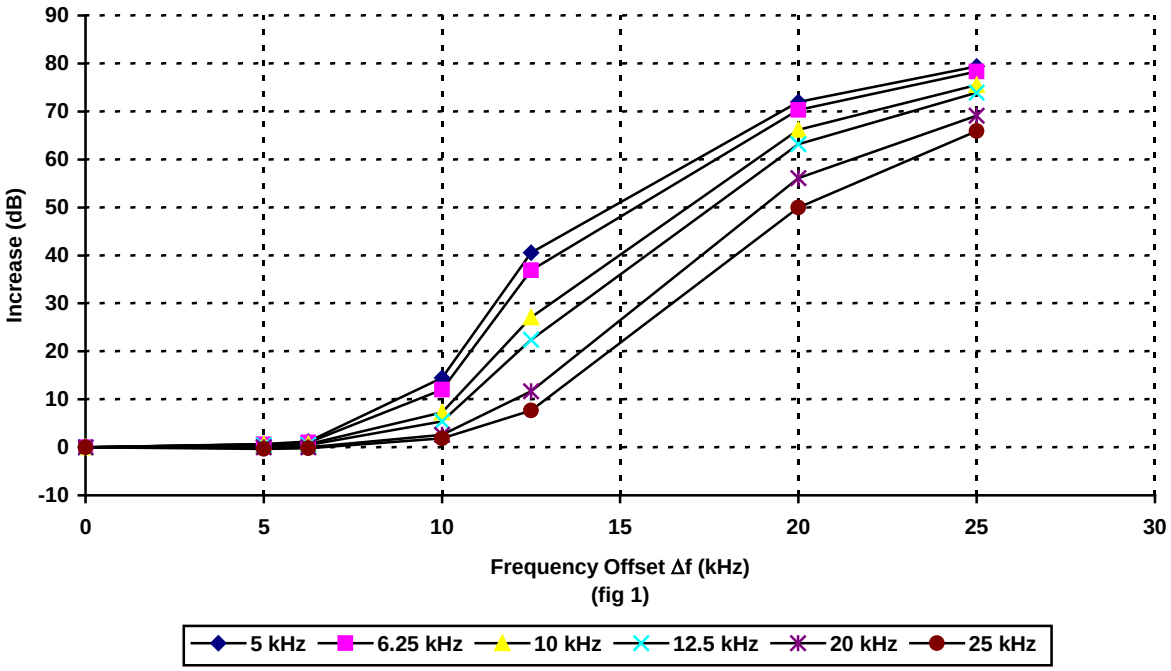
For Transmitters:

necessary bandwidth (kHz)	channel spacing (kHz)
$\leq$ 4.4	5.0
> 4.4 and $\leq$ 5.5	6.25
> 5.5 and $\leq$ 8.8	10.0
> 8.8 and $\leq$ 11	12.5
> 11 and $\leq$14	20
> 14 and $\leq$16	25

For Receivers:

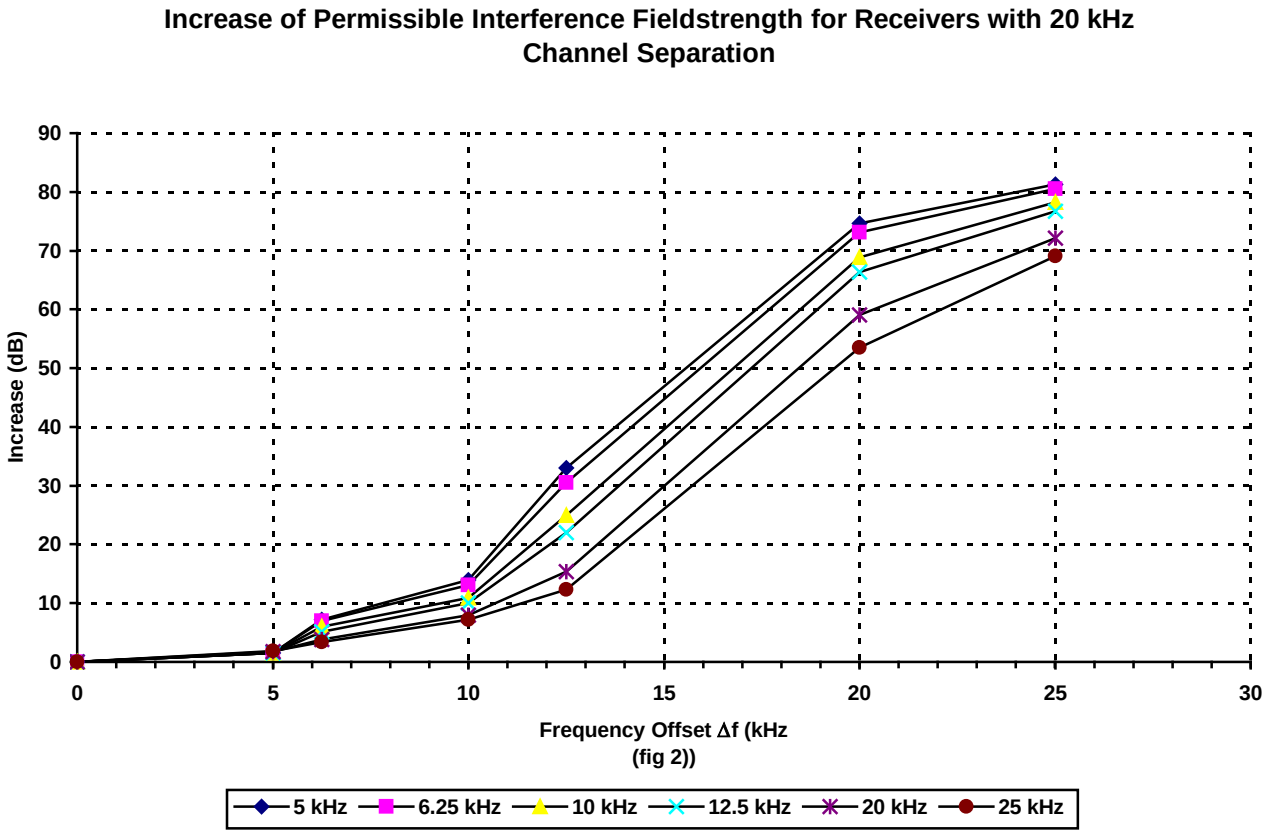
necessary bandwidth (kHz)	channel spacing (kHz)
$\leq$ 11	12.5
> 11 and $\leq$ 14	20
> 14	25

Increase of Permissible Interference Fieldstrength for Receivers with 25 kHz Channel Separation



	Channel Separation of interfering transmitter (kHz)					
Δf (kHz)	5	6,25	10	12,5	20	25
0	0,0	0,0	0,0	0,0	0,0	0,0
5	0,7	0,6	0,6	0,4	0,0	-0,3
6,25	1,2	1,0	0,7	0,5	0,0	-0,2
10	14,5	12,0	7,3	5,4	2,6	1,9
12,5	40,6	36,9	27,1	22,4	11,7	7,7
20	72,0	70,3	66,2	63,2	56,1	50,0
25	79,4	78,3	75,5	73,9	69,1	65,9

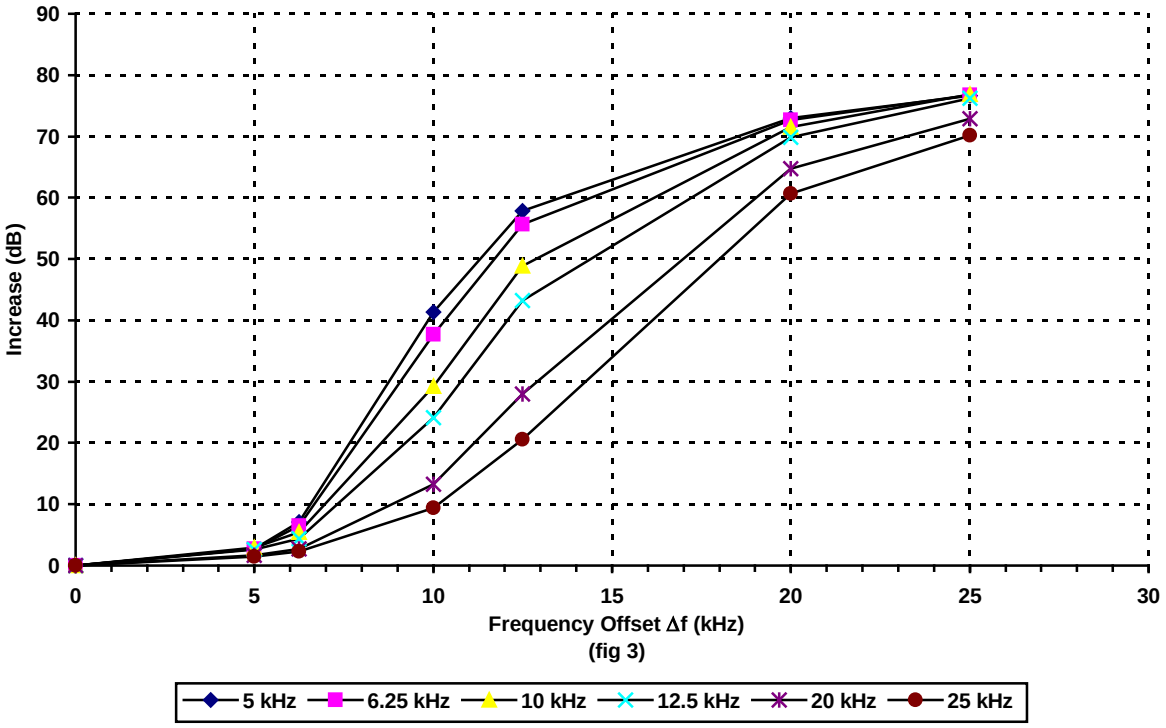
Table 1



	Channel Separation of interfering transmitter (kHz)					
Δf (kHz)	5 kHz	6.25 kHz	10 kHz	12.5 kHz	20 kHz	25 kHz
0	0,0	0,0	0,0	0,0	0,0	0,0
5	1,5	1,5	1,5	1,5	1,7	1,9
6,25	7,2	7,0	6,0	5,1	3,8	3,4
10	14,0	13,1	10,9	10,0	8,0	7,2
12,5	33,0	30,5	24,9	22,0	15,4	12,3
20	74,6	73,1	68,9	66,4	59,1	53,5
25	81,3	80,5	78,2	76,7	72,1	69,1

Table 2

Increase of Permissible Interference Fieldstrength for Receivers with 12.5 kHz Channel Separation



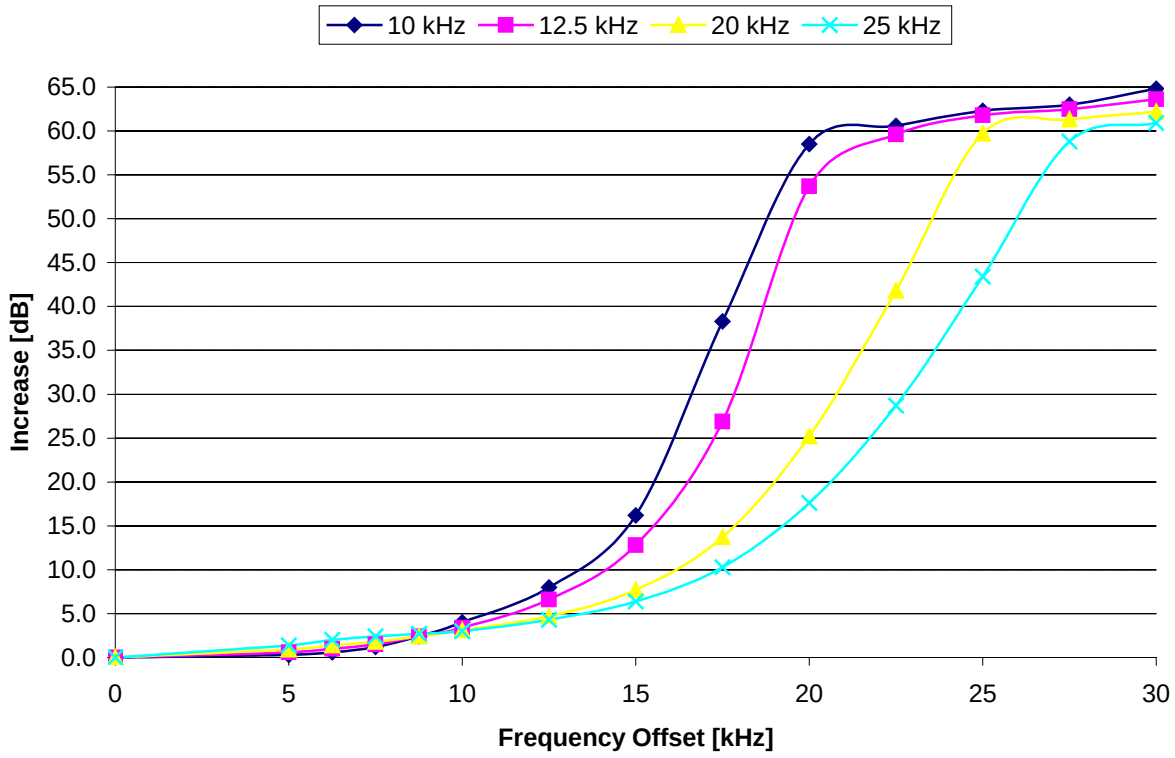
	Channel Separation of interfering transmitter (kHz)					
Δf (kHz)	5 kHz	6.25 kHz	10 kHz	12.5 kHz	20 kHz	25 kHz
0	0,0	0,0	0,0	0,0	0,0	0,0
5	2,7	2,7	2,9	2,6	1,7	1,5
6,25	7,1	6,5	5,4	4,4	2,7	2,3
10	41,3	37,7	29,2	24,1	13,3	9,4
12,5	57,8	55,6	48,9	43,2	28,0	20,6
20	73,0	72,7	71,5	69,9	64,7	60,7
25	76,6	76,7	76,8	76,2	72,9	70,2

Table 3

Increase of Permissible Interference Fieldstrength for Analogue Receivers interfered by a TETRA signal

	Channel Separation of Receiver			
Δf [kHz]	10 kHz	12.5 kHz	20 kHz	25 kHz
0	0.0	0.0	0.0	0.0
5	0.3	0.6	0.9	1.4
6.25	0.6	1.0	1.4	2.0
7.5	1.2	1.5	1.8	2.4
8.75	2.4	2.4	2.4	2.7
10	4.0	3.4	3.1	3.0
12.5	8.0	6.6	4.7	4.3
15	16.2	12.8	7.7	6.4
17.5	38.3	26.9	13.7	10.3
20	58.5	53.7	25.2	17.6
22.5	60.6	59.6	41.8	28.7
25	62.3	61.8	59.7	43.4
27.5	63.0	62.5	61.3	58.8
30	64.8	63.6	62.2	60.9

Table 4

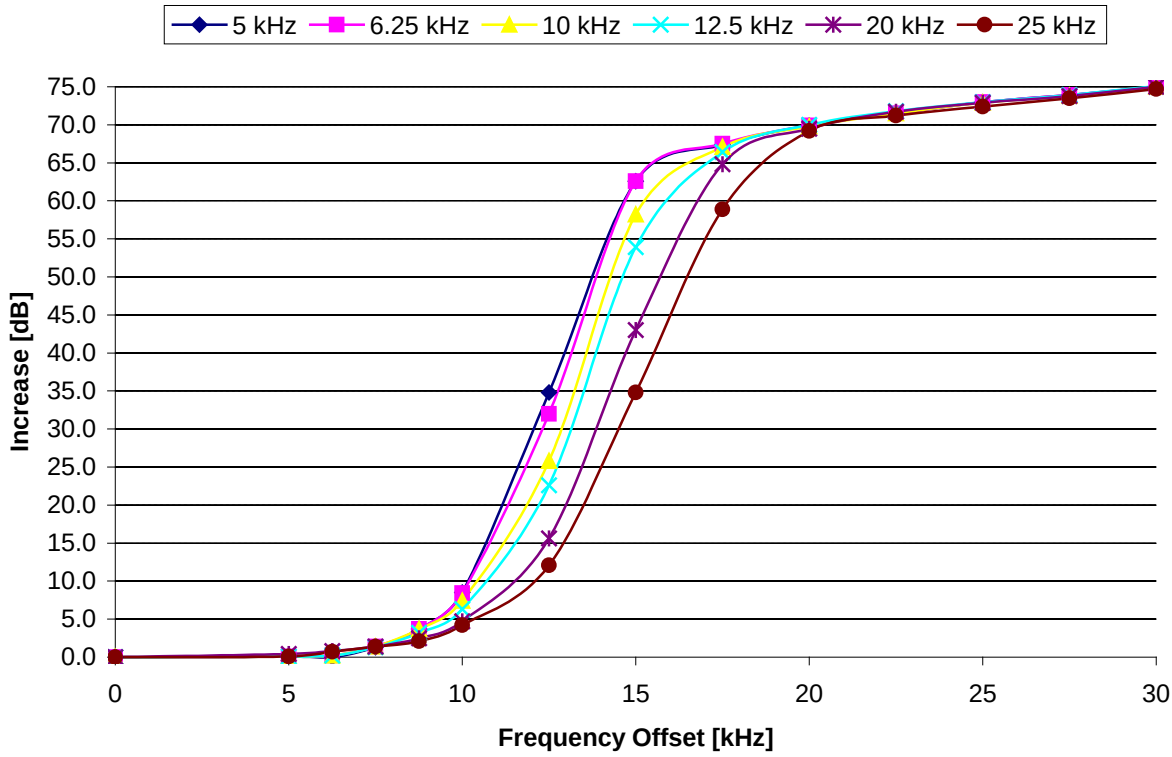


(fig 4)

Increase of Permissible Interference Fieldstrength for TETRA Receivers interfered by an analogue signal

	Channel Separation of interfering analogue signal					
Δf [kHz]	5 kHz	6.25 kHz	10 kHz	12.5 kHz	20 kHz	25 kHz
0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.1	0.4	0.1
6.25	0.0	0.2	0.2	0.2	0.8	0.7
7.5	1.3	1.4	1.4	1.3	1.4	1.4
8.75	3.7	3.7	3.7	3.2	2.5	2.1
10	8.5	8.4	7.4	6.3	4.7	4.2
12.5	34.8	32.0	25.8	22.6	15.6	12.1
15	62.6	62.6	58.2	53.9	43.0	34.8
17.5	67.4	67.5	67.1	66.4	64.8	58.9
20	69.9	69.9	69.8	70.0	69.5	69.2
22.5	71.5	71.5	71.5	71.8	71.7	71.2
25	73.0	73.0	72.9	73.0	72.9	72.4
27.5	73.9	73.9	73.8	73.9	73.8	73.5
30	75.0	75.0	75.0	75.1	75.0	74.7

Table 5



(fig 5)

For the bands 380 - 385 MHz and 390 - 395 MHz and between digital mobile systems, the correction factor (a_{corr}) for different frequency offsets (Δf) is given by the following formulas:

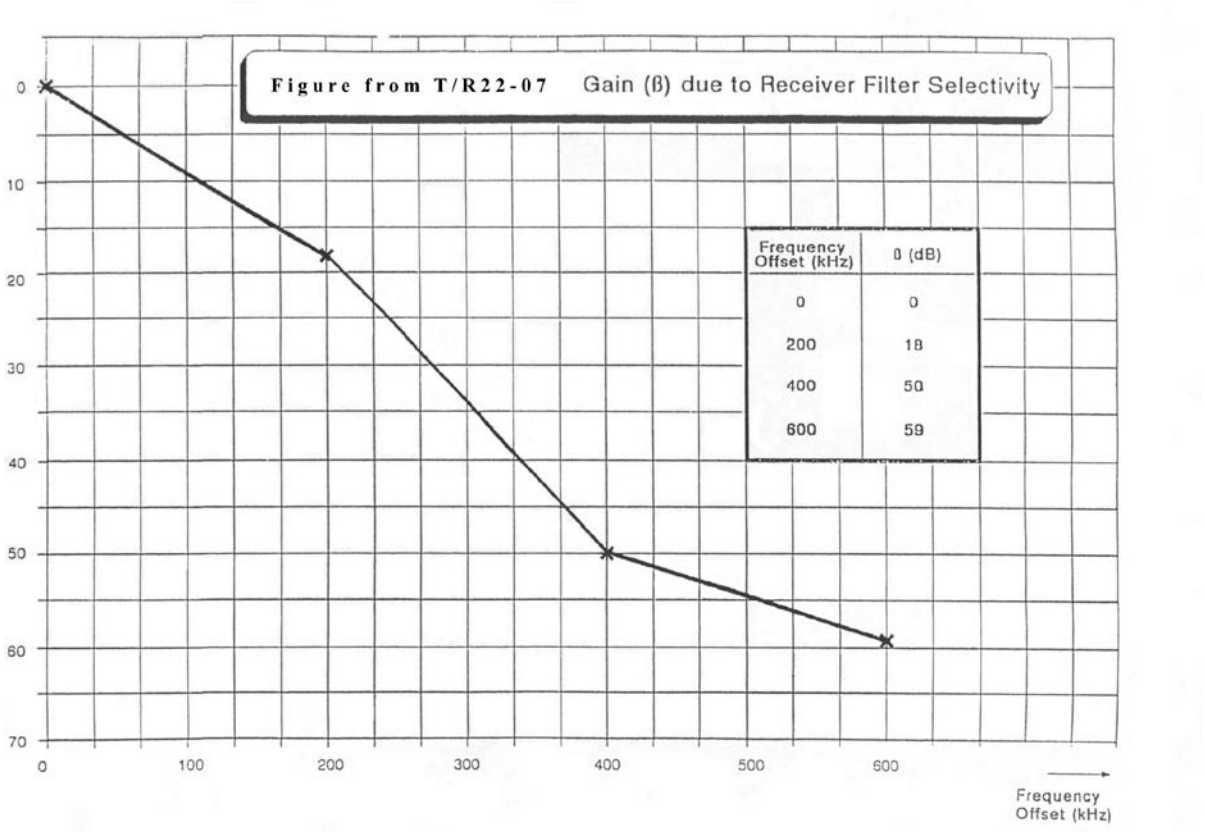
a_{corr} = 0 dB for $\Delta f < (B_1 + B_2) / 2$,

a_{corr} = 45 dB for $(B_1 + B_2) / 2 \leq \Delta f \leq (B_1 + 2 * B_2) / 2$,

a_{corr} = 82 dB for $\Delta f > (B_1 + 2 * B_2) / 2$

where B_1 is the channel spacing of the wider and B_2 that of the narrower system.

For GSM 1800 the following figure should be applied



Increase of Permissible Interference Fieldstrength for Systems not yet defined in this Annex

Definitions:

Normalization:

Ω = Delta f / B1 where B1≥B2

a_{corr} for interferer with identical bandwidth:

$a_{corr-B1}$ = 0 dB for Ω < 0.5

$a_{corr-B1}$ = (Ω * 33.3 – 16.7) dB for 0.5 ≤ Ω ≤ 2

$a_{corr-B1}$ = (Ω * 10 + 30) dB for Ω > 2

a_{corr} for sine interferer:

$a_{corr-Sinus}$ = 0 dB for Ω < 0,5

$a_{corr-Sinus}$ = (Ω * 66.7 – 33.3) dB for 0.5 ≤ Ω ≤ 1.25

$a_{corr-Sinus}$ = (Ω * 20 + 25) dB for 1.25 < Ω ≤ 1.75

$a_{corr-Sinus}$ = (Ω * 4.8 + 51.6) dB for Ω > 1.75

Interpolation at 0 ≤ B2 ≤ B1 and 0 respectively ≤ B(interferer) ≤ B(victim)

$$a_{corr} = a_{corr-Sinus} - [a_{corr-Sinus} - a_{corr-B1}] * B2/B1$$

where:

Ω =normalized frequency
Delta f = difference frequency between interferer and victim
B1 =occupied bandwidth of the wider band system
B2 =occupied bandwidth of the narrower band system
$a_{corr-B1}$ = correction factor in case B1 = B2
$a_{corr-Sinus}$ = correction factor in case the interferer is a sine carrier
a_{corr} = resulting correction factor for two systems colliding with each other

Depending on the relation of B2/B1 the correction factor will be between the two curves below.