



EXERCISE 2

- Downlink
- Interference from Digital (wide) to Digital(narrow)
- Wanted
 - THAICOM-AK2 (78.5°E)
 - Group ID : 96604135
 - Emission : 22K0G7W
- Interfering
 - INTERSPUTNIK-75E-Q(75°E)
 - Group ID : 105625699
 - Emission : 32M2G7W



Exercise 2	Interference from Digital wide to Digital narrow				
Wanted	THAICOM-AK2 (78.5E)			Longitudinal Tolerance	0.1
Interfering	INTERSPUTNIK-75E-Q (75E)			Longitudinal Tolerance	0.1
DOWNLINK					
	Wanted			Interfering	
Beam	TK1			002	
Group ID	96604135			105625699	
Emission	22K0G7W			32M2G7W	
Wanted E/S long	106.86				
Wanted E/S Lat	18.85				
Topocentric angle	3.73				
Wanted E/s sidelobe pattern	A-25log()	A=29			
Frequency (MHZ)	12585				
	Carrier			Interference	
Ps	-14		Ps		
Gs			Gs		
ES relative to wanted beam peak	-4		ES relative to interfering beam peak	-1.58	
FSL	-205.82		FSL	-205.87	
Ges			Wanted Ges()		
BW(Hz)					
Tes					
Carrier			Interference		
Noise					
C/N					
C/I basic					
adj factor					
C/I adj					
C/I req'd			C/N+12.2		
Margin				2	
to add 1.87			Sect B3 ROP Attachment2 para5		

Exercise 2	Interference from Digital wide to Digital narrow			
Wanted	THAICOM-AK2 (78.5E)			Longitudinal Tolerance
Interfering	INTERSPUTNIK-75E-Q (75E)			Longitudinal Tolerance
DOWNLINK				
Beam	Wanted			Interfering
Group ID	TK1			002
Emission	96604135			105625699
Wanted E/S long	22K0G7W	Slide 10		Slide 11
Wanted E/S Lat	106.86			32M2G7W
Topocentric angle	18.85			
Wanted E/s sidelobe pattern	3.73			
Frequency (MHZ)	A-25log()	A=29		
	12585			
	Carrier			Interference
Ps	-14.9	Slide 5		Slide 6
Gs	38.9	Slide 5		Slide 6
ES relative to wanted beam peak	-4			
FSL	-205.82			
Ges	41.5	Slide 5		Slide 6
BW(Hz)	22000	Slide 5		
Tes	200	Slide 5		
Carrier	-144.32			Interference
Noise	-162.17			-140.84

					Slide 6	
Ps	-14.9	Slide 5		Ps		14.9
Gs	38.9	Slide 5		Gs	Slide 6	37
ES relative to wanted beam peak	-4			ES relative to interfering beam peak		-1.58
FSL	-205.82			FSL		-205.87
Ges	41.5	Slide 5		Wanted Ges()	Slide 6	14.71
BW(Hz)	22000	Slide 5				32000000
Tes	200	Slide 5				
Carrier	-144.32			Interference		-140.84
Noise	-162.17					
C/N	17.85					
C/I basic	-3.48					
adj factor	-31.63	Slide 7 8				
C/I adj	28.15					
C/I req'd	30.05			C/N+12.2		Solution
Margin	-1.90					4
to add 1.87	-0.03			Sect B3 ROP Attachment2 para5		

Wanted

THAICOM-AK2 (96500002)

B1a/BR17 Beam designation		TK1	B1b Steerable		B2 Emi-Rcp		E	B3a1 Max. co-polar gain		38.9			
BR7a/BR7b Group id		96604135	BR1 Date of receipt		08.01.1996		C2c RR No. 4.4						
A2a Date of bringing into use		17.12.1993	A2b Period of valid.		35		A3a Op. agency		1				
A3b Adm. resp.		A		BR16 Value of type C8b									
BR62 Expiry date for bringing into use		06.08.2000		BR63 Confirmed date of bringing into use		17.12.1993		BR64 Date of r					
BR14 Special Section													
C4a Class of station		EC		C3a Assigned freq. band		54000		C6b Polarization angle					
C4b Nature of service		CP		C6a Polarization type									
C8d1 Max. tot. peak pwr.				C8d2 Contiguous bandwidth									
C11a1 Service area no.		1		C11a2 Service area				C11a3 S					
A5/A6 Coordinations/Agreements		RR1060		O		G TON URS USA USA/IT							
C2a1 Assigned frequency													
12.5949		GHz		12.6575		GHz		12.7201		GHz			
A13 Ref. to Special Sections			C7a Design. of emission		C8a1/C8b1 Max. peak pwr		C8a2/C8b2 Max. pwr dens.		C8c1 Min. peak pwr		C8c2 Attch.		
AR11/A/727			1		22K0G7W--		-14.9		-58.3				
AR11/C/2196													
AP30/A/127													
C10b1 Assoc. earth station id.		C10b2 Type		C10c1 Geographical coord.		C10c2 Ctry		C10d1/C10d2 Cls. / Nat.		C10d3 Max. iso. gain		C10d4 Bmwdth	
TYPICAL K2 (6/1.2)		T						1 TC CP		41.5		1.45	
										200			
C10d5a Co-polar antenna pattern													
C10b1 Assoc. earth station id.		Co-polar ref. pattern		Coef. A		Coef. B		Coef. C		Coef. D		Phi1	
TYPICAL K2 (6/1.2)		A-25*LOG(FI)		29									
Findings		2D Date of protection		13A Conformity with RR		A- A- --		13B1 Provision		13B2 Remarks		13B3	
13C Remarks													

Form



INTERSPUTNIK-75E-Q (105500291)

B1a/BR17 Beam designation B1b Steerable B2 Emi-Rcp B3a1 Max. co-polar gain B3d Pointing accuracy

BR7a/BR7b Group id. BR1 Date of receipt C2c RR No. 4.4

A2a Date of bringing into use A2b Period of valid. A3a Op. agency A3b Adm. resp. BR16 Value of type C8b

BR62 Expiry date for bringing into use BR63 Confirmed date of bringing into use BR64 Date of receipt of 1st Res49

BR14 Special Section

C4a Class of station C3a Assigned freq. band

C4b Nature of service C6a Polarization type C6b Polarization angle

C8d1 Max. tot. peak pwr. C8d2 Contiguous bandwidth

C11a1 Service area no. C11a2 Service area C11a3 Service area diagram

A5/A6 Coordinations/Agreements	9.7 AP30#7.1 N/9.7	<input type="checkbox"/>	<input type="checkbox"/>	BRU	CHN	F/EUT	G	INS	LAO	RUS	SNG	THA	TUR	UAE	USA	VTN
		<input type="checkbox"/>	<input type="checkbox"/>	TON												

C2a1 Assigned frequency											
12.525	GHz	12.565	GHz	12.605	GHz	12.645	GHz	12.685	GHz		
12.545	GHz	12.585	GHz	12.625	GHz	12.665	GHz	12.705	GHz		

A13 Ref. to Special Sections	C7a Design. of emission	C8a1/C8b1 Max. peak pwr	C8a2/C8b2 Max. pwr dens.	C8c1 Min. peak pwr	C8c2 Attch.	C8c3 Min. pwr dens.	C8c4 Attch.	C8e1 C/N ratio	C8e2 Attch.
API/A/428	1 36M0F8W--	5.9	-60.1	0.9		-65.1		16.6	
CR/C/144	2 32M2G7W--	14.9	-60.1	7.9		-67.1		23.1	
	3 49R0GLX--	-16.6	-63.1	-23.6		-70.1		20.2	

C10b1 Assoc. earth station id.	C10b2 Type	C10c1 Geographical coord.	C10c2 Ctry	C10d1/C10d2 Cls. / Nat.	C10d3 Max. iso. gain	C10d4 Bmwdth	C10d6 Noise temp.	C10d7 Ant. diameter	C10d9 Ant. dim. (DGSO)
TYPICAL-4, 5	T			1 TC CP	53.3	0.36	200		

C10d5a Co-polar antenna pattern							
C10b1 Assoc. earth station id.	Co-polar ref. pattern	Coef. A	Coef. B	Coef. C	Coef. D	Phi1	Co-polar rad. diag.
TYPICAL-4, 5	REC-580						

Findings 2D Date of protection 13A Conformity with RR 13B1 Provision 13B2 Remarks 13B3 Date of Review

13C Remarks

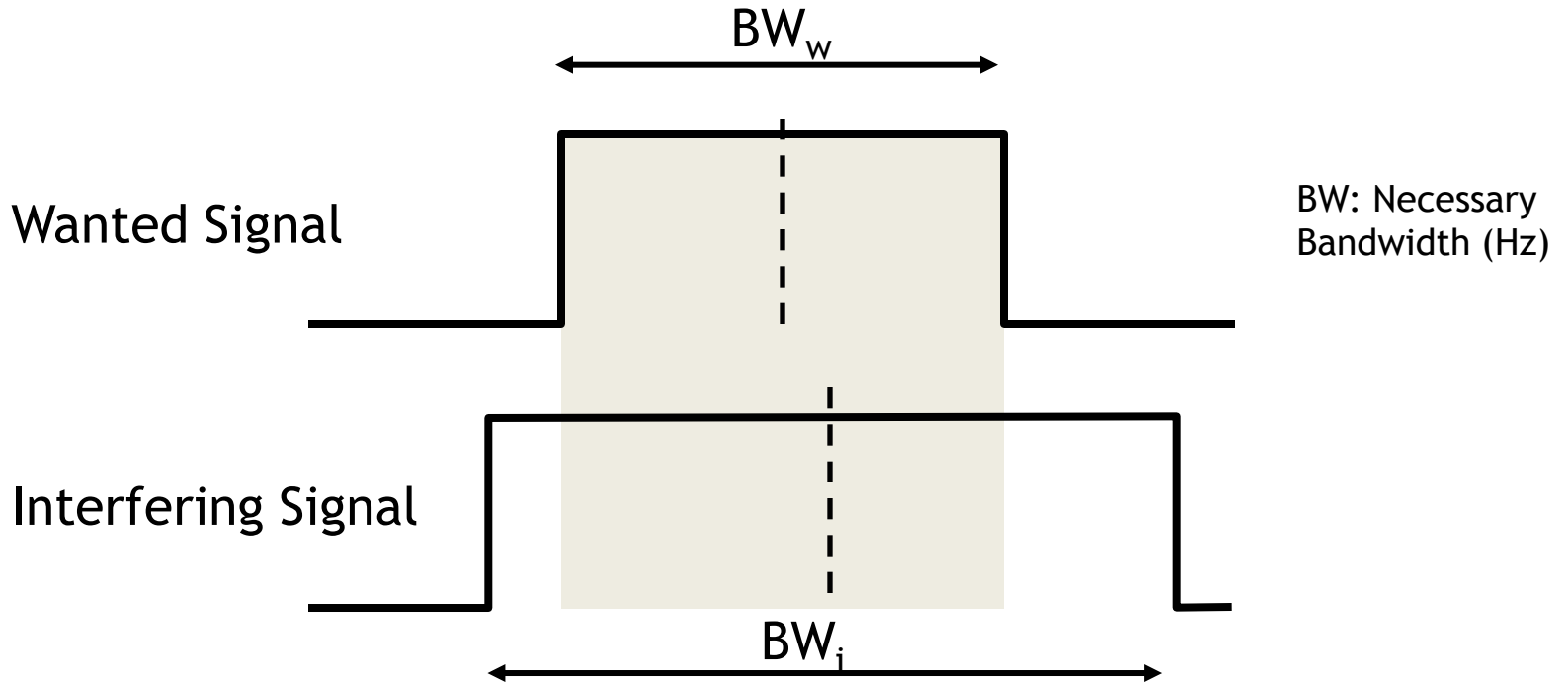
Form





Get Adjustment Factor

Method 1:



$$I_a = 10\log_{10} (BW_{\text{overlap}} / BW_i)$$

$$= 10\log_{10} (BW_w / BW_i)$$

[Form2](#)

< 0 = Improvement!



$$\text{Adj factor} = 10 \log_{10} (22000 / 32000000) = -31.63$$

[Form2](#)

Exercise 2

Interference from Digital(wide) to Digital(narrow)

Wanted	THAICOM-AK2 (78.5 deg E)	Longitudinal Tolerance	0.1
Interfering	INTERSPUTNIK-75E-Q (75 deg E)	Longitudinal Tolerance	0.1

DOWNLINK

	Wanted	Interfering
Beam	TK1	002
Group ID	966604135	105625699
Emission	22K0G7W	32M2G7W
Wanted E/S Long	106.86	
Wanted E/S Lat	18.85	
Topocentric Angle	3.73	
Wanted E/S Sidelobe Pattern	A-25log(θ)	

Frequency 12585

	Wanted	Interfering	
Ps	-14.9	14.9	
Gs	38.9	37	
ES relative to wanted beam		ES relative to interfering beam	
peak	-4	peak	-1.58
FSL	-205.82	FSL	-205.87
Ges	41.5	Ges(θ)	14.71
BW (Hz)	22000		32000000
Tes	200		

Carrier -144.32 Interference -140.84

Noise -162.17

C/N 17.85

C/I basic -3.48

adj factor -31.63

C/I adj 28.15

C/I required 30.05

Margin -1.90

to add 1.87 -0.03

$$\text{Adj factor} = 10 \log_{10} (22000 / 32000000) = -31.63$$

C/N+12.2

Wanted Carrier is Digital

Form2

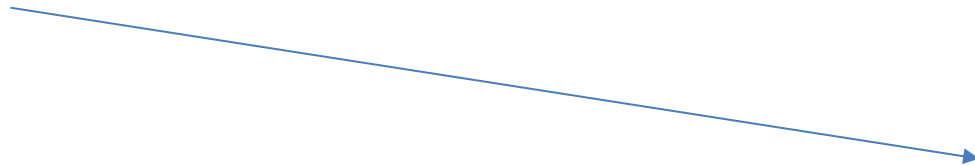




22K0G7W



Bandwith of wanted
Carrier 22.0 KHz



Carrier=Digital

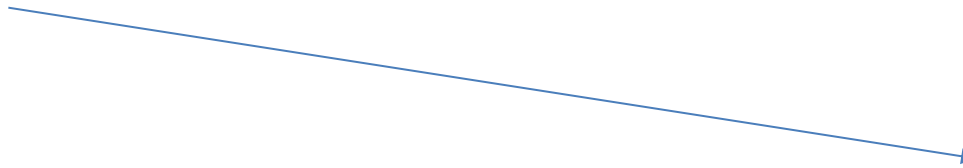
Form



32M2G7W



Bandwith of wanted
Carrier 32.2 MHz



Carrier=Digital

In the spreadsheet, there was a typo, the bandwidth of this carrier was indicated as 32000000(Hz) instead of 32200000(Hz)

[Form](#)