

ANNEX 3-2
FADING ANALYSIS

RADIO SYSTEM DESIGN - 4

BASE STATION (DHAMAR)
(BASE/REP. REP./REP.)

Profile No.	26	27	28	29	30	31	32	33
Station A	DHAMAR	DHAMAR	DHAMAR	J.AL LISI	J.AL LISI	J.YASLAH	J.AL MODBAAH	J.MANARA
Station B	J.YASLAH	J.AL LISI	J.MANARA	AL HIJAH	BYT ASH SHAMI	J.AL MODBAAH	ABU ATIF	AD DANN
Radio Freq. (GHz)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Ground Level (STA.A:M)	2430	2430	2430	2852	2852	2894	2380	2960
Ground Level (STA.B:M)	2894	2852	2960	2540	2600	2380	2480	2480
Antenna Height (STA.A:M)	20	20	20	20	20	15	15	9
Antenna Height (STA.B:M)	10	15	4	10	10	10	10	10
Feeder Length (STA.A:M)	37	37	37	30	30	32	19	18
Feeder Length (STA.B:M)	27	25	13	14	14	14	14	14
Feeder Loss/M (STA.A:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M (STA.B:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss (STA.A:dB)	2.8	2.8	2.8	2.3	2.3	2.4	1.4	1.4
Feeder Loss (STA.B:dB)	2	1.9	1	1.1	1.1	1.1	1.1	1.1
Hop Distance (KM)	44.4	15.9	30.3	14.2	25.4	22.2	11.1	31.9
Free Space Loss (dB)	133	124.1	129.7	123.1	128.1	127	121	130.1
Antenna Type (STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type (STA.B)	3.0mD G.P	HORN	1.2mD G.P	HORN	HORN	HORN	HORN	1.2mD G.P
Antenna Gain (STA.A:dBi)	10	10	10	10	10	10	10	10
Antenna Gain (STA.B:dBi)	34.8	20	27.5	20	20	20	20	27.5
Branching Loss (dB)	4	4	4	4	4	4	4	4
TX Out Put Power (dBm)	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
RX Input Level (dBm)	-65.5	-71.3	-68.5	-69	-74	-73	-66	-67.6
RX Level (dBm) (BER:E-03)	-92	-92	-92	-92	-92	-92	-92	-92
Fading Margin (dB)	26.5	20.7	23.5	23	18	19	26	24.4
Fading Depth Estimated (dB)	14.1	0	8.3	0	5.6	3.5	0	9
System Margin (dB)	12.4	20.7	15.2	23	12.4	15.5	26	15.4
Path Condition	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN

RADIO SYSTEM DESIGN - 7

BASE STATION (HUDAYDAH)
(BASE/REP. REP./REP.)

Profile No.	54	55	56	57	58
Station A	AZ ZAYDIYAH	DAYR KHALIL	DAYR KHALIL	AL KAIB	HUDAYDAH
Station B	DAYR AKHRASHI	AL ABBASI	AL KAIB	AZ ZAYDIYAH	DAYR KHALIL
Radio Freq.(GHz)	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	60	140	140	100	6
Ground Level(STA.B:M)	60	90	100	60	140
Antenna Height(STA.A:M)	60	40	40	30	25
Antenna Height(STA.B:M)	34	58	25	59	40
Feeder Length(STA.A:M)	90	44	44	34	40
Feeder Length(STA.B:M)	38	62	29	89	44
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.075	0.075	0.075	0.075	0.075
Feeder Loss(STA.A:dB)	6.8	3.3	3.3	2.6	3
Feeder Loss(STA.B:dB)	2.9	4.7	2.2	6.7	3.3
Hop Distance(KM)	31.2	35.9	22.4	30.1	31.4
Free Space Loss(dB)	129.9	131.1	127	129.6	130
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	2.4mD G.P	3.0mD G.P	1.2mD G.P	3.0mD G.P	3.0mD G.P
Antenna Gain(STA.A:dBi)	10	10	10	10	10
Antenna Gain(STA.B:dBi)	32.9	34.8	27.5	34.8	34.8
Branching Loss(dB)	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-69.2	-66.8	-67.5	-66.6	-64
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92
Fading Margin(dB)	22.8	25.2	24.5	25.4	28
fading Depth Estimated(dB)	12	14.1	7	11.4	12.1
System Margin(dB)	10.8	11.1	17.5	14	15.9
Path Condition	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN

RADIO SYSTEM DESIGN - 8

BASE STATION (HUDAYDAH)
(REP./SUB. 1)

Profile No.	59	60	61	62	63	64	65	66	67
Station A	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH	DAYR AKHRASH
Station B	AL LUHAYYAH	AL HUMASIYAH	AL QANAMAH	MAWR	AZ ZUHRAH	AL MUTARID	DAYR DUKHAH	DAYR KUZABAH	DAYR ABDALLAH
Radio Freq.(GHZ)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	60	60	60	60	60	60	60	60	60
Ground Level(STA.B:M)	5	40	60	60	60	80	100	80	70
Antenna Height(STA.A:M)	50	50	50	50	50	50	50	50	50
Antenna Height(STA.B:M)	16	10	10	10	12	10	10	10	10
Feeder Length(STA.A:M)	54	54	54	54	54	54	54	54	54
Feeder Length(STA.B:M)	20	14	14	14	16	14	14	14	14
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Feeder Loss(STA.A:dB)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Feeder Loss(STA.B:dB)	2.6	1.8	1.8	1.8	2.1	1.8	1.8	1.8	1.8
Hop Distance(KM)	32	15	14.8	6.1	12.3	13.1	15.4	15.3	14.4
Free Space Loss(dB)	130.1	123.6	123.4	115.8	121.8	122.4	123.8	123.7	123.2
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	1.8mD G.P.HORN	HORN	HORN	HORN	HORN	HORN	HORN	HORN	HORN
Antenna Gain(STA.A:dBi)	10	10	10	10	10	10	10	10	10
Antenna Gain(STA.B:dBi)	31.3	20	20	20	20	20	20	20	20
Branching Loss(dB)	4	4	4	4	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-68	-72	-71.8	-64.2	-70.5	-70.8	-72.2	-72.1	-71.6
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92	-92	-92	-92	-92
Fading Margin(dB)	24	20	20.2	27.8	21.5	21.2	19.8	19.9	20.4
Fading Depth Estimated(dB)	12.4	0	0	0	0	0	0.3	0.2	0
System Margin(dB)	11.6	20	20.2	27.8	21.5	21.2	19.5	19.7	20.4
Path Condition	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN	PLAIN

RADIO SYSTEM DESIGN -10

BASE STATION (HUDAYDAH)
(REP./SUB. 3)

Profile No.	76	77	78	79	80
Station A	DAYR KHALIL	DAYR KHALIL	DAYR KHALIL	AL ABBASI	AL ABBASI
Station B	AD DAWM	AZ ZUBAYRIYAH	DAYR AL MUDAWWAR	KUSMA	MARKAZ BILAD ATTAAM
Radio Freq.(GHz)	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	140	140	140	90	90
Ground Level(STA.B:M)	100	90	130	2680	1680
Antenna Height(STA.A:M)	40	40	40	58	58
Antenna Height(STA.B:M)	10	10	10	10	10
Feeder Length(STA.A:M)	44	44	44	62	62
Feeder Length(STA.B:M)	14	14	14	14	14
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.13	0.13	0.13	0.075	0.075
Feeder Loss(STA.A:dB)	3.3	3.3	3.3	4.7	4.7
Feeder Loss(STA.B:dB)	1.8	1.8	1.8	1.1	1.1
Hop Distance(KM)	8.8	7.1	7.1	40.5	39.5
Free Space Loss(dB)	118.9	117.1	117.1	132.2	132
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	HORN	HORN	HORN	1.8mD G.P.	1.8mD G.P.
Antenna Gain(STA.A:dBi)	10	10	10	10	10
Antenna Gain(STA.B:dBi)	20	20	20	31.3	31.3
Branching Loss(dB)	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-66.5	-64.7	-64.7	-69.2	-69
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92
Fading Margin(dB)	25.5	27.3	27.3	22.8	23
Fading Depth Estimated(dB)	0	0	0	11.9	11.5
System Margin(dB)	25.5	27.3	27.3	10.9	11.5
Path Condition	PLAIN	PLAIN	PLAIN	MOUNTAIN	MOUNTAIN

RADIO SYSTEM DESIGN - 11

BASE STATION (IBB)
(BASE/REP. REP./REP.)

Profile No.	81	82	83	84
Station A	IBB	IBB	J.AL QABRAYN J.SAID	J.AL QABRAYN
Station B	J.AL QABRAYN	MASHWARAH	J.SAID	J.SUMARAH
Radio Freq.(GHz)	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	1985	1985	2948	2948
Ground Level(STA.B:M)	2948	2300	2480	2973
Antenna Height(STA.A:M)	20	20	15	15
Antenna Height(STA.B:M)	10	10	10	10
Feeder Length(STA.A:M)	35	35	26	26
Feeder Length(STA.B:M)	21	14	14	21
Feeder Loss(M(STA.A:dB)	0.075	0.075	0.075	0.075
Feeder Loss(M(STA.B:dB)	0.075	0.075	0.075	0.075
Feeder Loss(STA.A:dB)	2.6	2.6	2	2
Feeder Loss(STA.B:dB)	1.6	1.1	1.1	1.6
Hop Distance(KM)	13.1	9.1	21.5	37.3
Free Space Loss(dB)	122.4	119.2	126.7	131.5
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	HORN	HORN	HORN	1.2mD G.P
Antenna Gain(STA.A:dBi)	10	10	10	10
Antenna Gain(STA.B:dBi)	20	20	20	27.5
Branching Loss(dB)	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-69.1	-65.4	-72.3	-70.1
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92
Fading Margin(dB)	22.9	26.6	19.7	21.9
Fading Depth Estimated(dB)	0	0	3	11.4
System Margin(dB)	22.9	26.6	16.7	10.5
Path Condition	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN

RADIO SYSTEM DESIGN -14

BASE STATION (TAIZZ)
(BASE/REP. REP./REP.)

Profile No.	104	105	106	107	108	109	110	111
Station A	TAIZZ	ARUS(O/H)	ARUS(O/H)	J.HABASHI	J.HABASHI	ARID	H:AN HANAN	J:AN NAR
Station B	ARUS(O/H)	H.OMAIMAH	J.HABASHI	H.AN HANANARID	J.SABARAN	J.AN NAR	J.AL UMARI	
Radio Freq.(GHz)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	1345	2820	2820	2320	2320	1600	460	340
Ground Level(STA.B:M)	2820	1320	2320	460	1600	2080	340	300
Antenna Height(STA.A:M)	20	15	15	43	43	15	15	15
Antenna Height(STA.B:M)	10	10	10	10	15	10	10	10
Feeder Length(STA.A:M)	40	48	48	47	47	19	19	19
Feeder Length(STA.B:M)	43	14	14	14	19	14	14	14
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss(STA.A:dB)	3	3.6	3.6	3.5	3.5	1.4	1.4	1.4
Feeder Loss(STA.B:dB)	3.2	1.1	1.1	1.4	1.4	1.1	1.1	1.1
Hop Distance(KM)	5.2	29.4	20.4	22.2	13.8	27.2	23.8	32.8
Free Space Loss(dB)	114.4	129.4	126.2	127	122.8	128.7	127.6	130.4
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	HORN	1.2mD G.P	HORN	HORN	HORN	HORN	HORN	1.2mD G.P
Antenna Gain(STA.A:dBi)	10	10	10	10	10	10	10	10
Antenna Gain(STA.B:dBi)	20	27.5	20	20	20	20	20	27.5
Branching Loss(dB)	4	4	4	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-63.1	-69.1	-73.4	-74.1	-70.2	-73.7	-72.6	-67.9
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92	-92	-92	-92
Fading Margin(dB)	28.9	22.9	18.6	17.9	21.8	18.3	19.4	24.1
Fading Depth Estimated(dB)	0	7.8	2.2	3.5	0	6.6	8.7	13.6
System Margin(dB)	28.9	15.1	16.4	14.4	21.8	11.7	10.7	10.5
Path Condition	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	PLAIN	PLAIN

RADIO SYSTEM DESIGN - 15

BASE STATION (TAIZZ)
(REP./SUB. 1)

Profile No.	112	113	114	115	116	117	118	119	120	121
Station A	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	ARUS(O/H)	H.OMAIMAH	H.OMAIMAH
Station B	HADNAN	AL HUSAYN	AL AMAKIR	AL AMAQI	QARAMAH	AS SAMKAR	AZ ZAHRAH	ARABAH	BAYT UBAYDAN	QARYAT JARANI
Radio Freq.(GHz)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	2820	2820	2820	2820	2820	2820	2820	2820	1320	1320
Ground Level(STA.B:M)	2400	1160	1640	1480	1440	1440	1420	1420	1380	1420
Antenna Height(STA.A:M)	15	15	15	15	15	15	15	15	15	15
Antenna Height(STA.B:M)	12	10	10	10	10	10	10	10	10	10
Feeder Length(STA.A:M)	48	48	48	48	48	48	48	48	19	19
Feeder Length(STA.B:M)	16	14	14	14	14	14	14	14	14	14
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Feeder Loss(STA.A:dB)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	1.4	1.4
Feeder Loss(STA.B:dB)	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Hop Distance(KM)	4.8	23.6	24	20.1	17.1	13.8	21.2	17.3	5.3	5.5
Free Space Loss(dB)	113.7	127.5	127.6	126.1	124.7	122.8	126.6	124.8	114.5	114.9
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	HORN	HORN	HORN	HORN	HORN	HORN	HORN	HORN	HORN	HORN
Antenna Gain(STA.A:dBi)	10	10	10	10	10	10	10	10	10	10
Antenna Gain(STA.B:dBi)	20	20	20	20	20	20	20	20	20	20
Branching Loss(dB)	4	4	4	4	4	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-61.9	-75.4	-75.5	-74	-72.6	-70.7	-74.5	-72.7	-60.2	-60.6
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92	-92	-92	-92	-92	-92
Fading Margin(dB)	30.1	16.6	16.5	18	19.4	21.3	17.5	19.3	31.8	31.4
Fading Depth Estimated(dB)	0	4.5	4.7	2	0	0	2.8	0	0	0
System Margin(dB)	30.1	12.1	11.8	16	19.4	21.3	14.7	19.3	31.8	31.4
Path Condition	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN

RADIO SYSTEM DESIGN -16

BASE STATION (TAIZZ)
(REP./SUB. 2)

Profile No.	122	123	124	125	126	127	128	129	130	131
Station A	ARID	ARID	J.SABARAN	J.SABARAN	J.SABARAN	J.AN NAR	J.AN NAR	J.AN NAR	J.AL UMARI	J.AL UMARI
Station B	VUFUS	AL MUDAYHIS	ASH SHARAFHAYFAN	SHAWHAT	J.WADI BISYAN	YAKHTUL	ATH THAWBANI	DHUBAB	BAB AL MANDAB	
Radio Freq.(GHz)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Ground Level(STA.A:M)	1600	1600	2080	2080	2080	340	340	340	300	300
Ground Level(STA.B:M)	1240	1040	1850	1680	1480	240	5	140	5	5
Antenna Height(STA.A:M)	15	15	35	35	35	15	15	15	15	15
Antenna Height(STA.B:M)	10	10	10	10	10	10	10	10	10	10
Feeder Length(STA.A:M)	19	19	39	39	39	19	19	19	19	19
Feeder Length(STA.B:M)	14	14	14	14	14	14	14	14	14	14
Feeder Loss/M(STA.A:dB)	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Feeder Loss/M(STA.B:dB)	0.13	0.13	0.13	0.13	0.13	0.13	0.075	0.13	0.13	0.075
Feeder Loss(STA.A:dB)	1.4	1.4	2.9	2.9	2.9	1.4	1.4	1.4	1.4	1.4
Feeder Loss(STA.B:dB)	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.8	1.8	1.1
Hop Distance(KM)	12.2	17.2	16.4	16.1	14	14.9	26.5	4.5	11.7	38.1
Free Space Loss(dB)	121.8	124.8	124.3	124.2	123	123.5	128.5	113.1	121.4	131.7
Antenna Type(STA.A)	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI	OMNI
Antenna Type(STA.B)	HORN	HORN	HORN	HORN	HORN	HORN	G.P	HORN	HORN	G.P
Antenna Gain(STA.A:dBi)	10	10	10	10	10	10	10	10	10	10
Antenna Gain(STA.B:dBi)	20	20	20	20	20	20	27.5	20	20	32.9
Branching Loss(dB)	4	4	4	4	4	4	4	4	4	4
TX Out Put Power(dBm)	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
RX Input Level(dBm)	-67.5	-70.5	-71.5	-71.4	-70.2	-69.2	-66	-58.8	-67.1	-63.8
RX Level (dBm)(BER:E-03)	-92	-92	-92	-92	-92	-92	-92	-92	-92	-92
Fading Margin(dB)	24.5	21.5	20.5	20.6	21.8	22.8	26	33.2	24.9	28.2
Fading Depth Estimated(dB)	0	0	0	0	0	0	17.5	0	5.3	23.2
System Margin(dB)	24.5	21.5	20.5	20.6	21.8	22.8	8.5	33.2	19.6	5
Path Condition	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	MOUNTAIN	SEA	PLAIN	SEA	SEA

