

SUPPORTING 1-12 PROJECT EVALUATION



SI-12-1

Benefits of the Computerized System



S1-12-1 Benefits of the Computerized System

1. Benefits of the Telephone-center System

Introduction

The benefits of the telephone-center system, such as reduction of personnel cost, shortening of processing time and paper-less, are assumed to be advantageous primarily in requests of new subscription.

Here we calculate personnel costs before and after the system implementation, and regard the difference between them as benefits.

Though benefits during 1996-2000 are calculated in the following way, in regard to benefits in post-2000, it is estimated to be near zero, because the number of subscribers rises higher in 1996-2000 than in post-2000.

Benefits during 1996-2000

(1) Formulas to calculate benefit in a telephone center per year

Formula A

$$\text{Benefit in a year} = \left(\begin{array}{l} \text{Necessary number of} \\ \text{workers before system} \\ \text{installation (Formula B)} \end{array} - \begin{array}{l} \text{Necessary number of} \\ \text{workers after system} \\ \text{installation (Formula C)} \end{array} \right) \times \$95 \times 12(\text{month})$$

Formula B

$$\text{Necessary number of workers before system implementation} = \frac{\text{Number of new subscribers in a year}}{\text{Number of transactions per worker} \times 250(\text{business day})}$$

Number of transactions : Number of transactions dealt with by a worker a day before system implementation

Formula C

$$\text{Necessary number of workers after system implementation} = \frac{\text{Number of new subscribers(1996-2000)}}{\text{Number of transactions per worker (Formula D)} \times 250(\text{business day})}$$

Formula D

$$\text{Number of transactions per worker} = \frac{\text{Working hours} \times 60 \times \text{Utilization rate}}{\text{Job-processing time}}$$

(2) Figures Applied to Formula D

- Number of transactions per workers before system implementation = 4 (from Mazzeb)
- Working hours = 6 hours
- Utilization rate = 0.6
- Job-processing time = 30(minutes)
- Number of new subscribers = Depend on each center

(3) Conclusion

Benefits of the telephone-center system are the sum total of benefits in all telephone centers in which computer system implemented for all years during 1996-2000, and are indicated below. Consequently, the benefits of the reduction personnel cost is about \$195,000 (= 8.2 million Syrian pounds) for 5 years.

Table 12. -1 Benefit of the Telephone-Center System (1996-2000)

	Total
(a) Number of workers before computerization	615
(b) Number of workers after computerization	444
(c) Difference((a)-(b))	171
Benefit ((C) * \$95 * 12(month))	\$194,940

2. Benefits of the New Billing-center System

Introduction

The benefits of the new billing system, such as telephone-center functions of entering executive forms and collecting information, are assumed to be advantageous primarily in issuing bills without delay. This is because bill-issuance delays cause considerable financial loss. The new billing system can eliminate this loss.

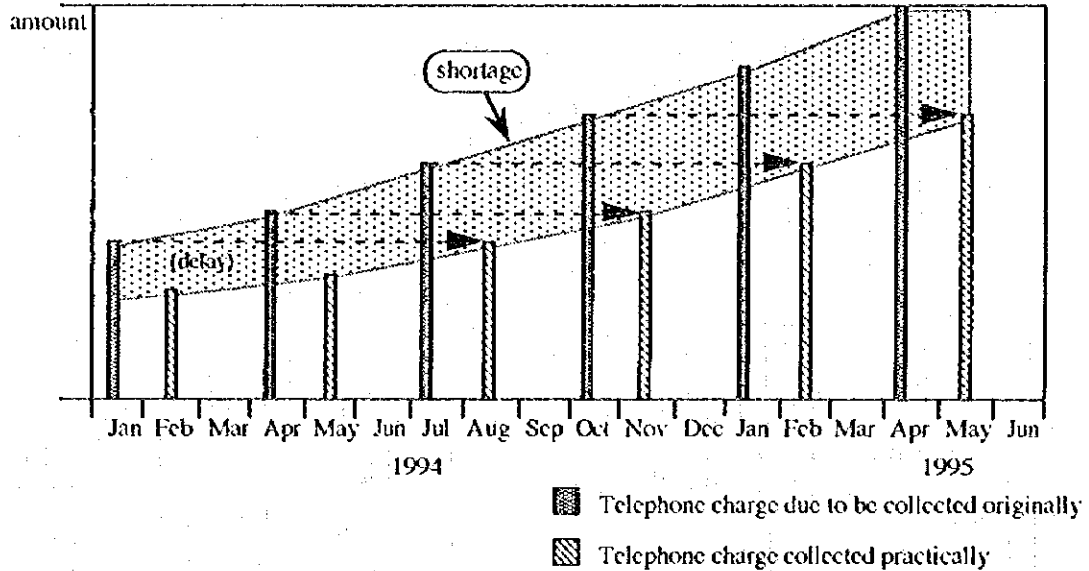
Outline of benefits

As the number of subscribers rises, total telephone revenue will grow accordingly. In the present billing system (VAX system), issuing bills has been much delayed and payment is made later than is desirable. In this situation, we find that the amount of telephone charges STE is collecting is less than what should be accumulated.

- For example, assume that issuing bills is delayed for six months in April 1995. Originally, in

April 1995, STE should issue bills and collect them within the following month for the first cycle (January to March) of 1995. The bills, however, and the collections are for the third cycle (July to September) of 1994. Because of increasing subscribers and telephone revenue, the telephone charges for the first cycle of 1995 would be more than for the third cycle of 1994. Accordingly, in April or May 1995, STE would collect less money than is proper (Figure 12. 1).

Figure 6.2.2-1 Shortage of collected telephone charge by collecting delay (Example)



STE therefore has to borrow money to cover the shortage until the next collection time and pay interest, which is a loss caused by delay in bill collecting or issuance. The next time collection is effected, STE must repay with interest the debt incurred at the previous collection time.

Under the circumstances, bill-issuance tardiness does not improve and the amount of telephone charges will increase in proportion the number of new subscribers. The interest, which is a financial loss, will continue to grow. If bills come to be issued at an appropriate time through the new billing system, no financial loss will arise. This would be a great benefit of the new billing system.

Detailed description of evaluating benefits

According to the course described above, we can evaluate the cause of the interest payments--the financial loss--by the unit of one year.

In fact, however, bills come to be issued at an appropriate time through Bull system and no more financial loss will arise until when the number of subscribers increases over 1,000,000, which would be a benefit of the billing system by Bull.

Therefore, the benefit of the next computerization plan from 1996 to 2010 is estimated by evaluating another cause of the interest payment--the financial loss, because bill issuance will delay again after the number of subscribers increases over 1,000,000.

The detailed calculation and the way to apply figures to parameters are as follows:

(1) Telephone charge on bills for each year

Telephone charges in bills for each year are predicted based on the present (1994) annual telephone charge and the number of subscribers.

Charges for calls are expected to increase in proportion to new subscribers, plus an additional 5% considering such factors as increasing telephone density, starting new service, and so on. (As a matter of fact, the increasing ratio of call charges was far more than that of subscribers in each year from 1990 until 1994.)

Subscription fees are presently unclear, so we evaluate them as increasing for each year in proportion to the number of subscribers, assuming that the number of official subscribers and that of residential subscribers are both 50% in total and that the collection proportion is 90%. Call charges and subscription fees constitute the total of annual telephone charges.

(2) The delay in issuing bills

The delay in issuing bills is anticipated to worsen because of new subscribers, so we assume the twice of subscribers of subscriber-based capacity would double the time for bill issuance, that is, when subscribers reach 2,000,000, issuance bill would delay for 3 months—1 cycle—by Bull system.

Therefore, we apply figures to the delay in issuing bills as shown in Table 12. -1.

Table 6.2.2-1 Anticipated bill-issuance delay

Year	1996	1997	1998	1999	2000
Subscribers(thousand)	1,032.80	1,237.80	1,442.90	1,648.00	1,854.20
Anticipated bill-issuance delay (month)	0.1	0.7	1.3	1.9	2.6

Note : The anticipated delay after 2000 is shown in Table 12.

(3) Amount of telephone charges collected each year

We assume that when one month delay is caused a year, STE would collect only 11 months of telephone charge for the year, and if the delay is worsen to 2-months delay the next year, the collected amount would consists of one month of the telephone charge for the previous year and 10 months for the year as follows.

Table 12. Amount of telephone charges collected each year

<u>Year</u>	<u>Delay</u>	<u>Total of telephone charges originally to be collected</u>	<u>Total of telephone charges collected in fact</u>
Year n	1 month	X(n)	(12-1)/12*X(n)
Year n+1	2 months	X(n+1)	1/12*X(n) + (12-2)/12*X(n+1)
Year n+2	3 months	X(n+2)	2/12*X(n+1) + (12-3)/12*X(n+2)

(4) Shortage of collections and resulting financial loss

STE has to borrow money for the shortage of telephone revenue due to be collected and when it borrows until the next year, the interest on the debt is a financial loss caused in the subject year. (Although the interest is paid back the next year, because the delay of issuing bills in the year caused the debt, the loss is considered as for the subject year.) Here the annual interest rate is considered as 9%, which is that for government loans.

The next year the shortfall is produced in the same way, and STE has to pay the debt for the previous year with interest. The shortage thus grows and the company has to borrow for the shortage again until the next year, which means additional interest. Thus, as the amount of charges to be collected continues to increase, debt is produced every year and the accompanying interest is a financial loss.

(5) Conclusion

According to this point of view, we evaluate the financial loss for each year from the 1996 to 2010. (We ignore the debt that might have been produced before 1996.)

As a result, the sum total reaches about 693 million Syrian pounds in 2000, and about 8.8 billion Syrian pounds in 2010. This amount is the expected benefit of the new computerized system because issuing bills will be accomplished without delay and STE will no longer have to borrow funds to cover collection delays. Tables 12 -12 show the details of the benefit evaluation.

Table 12 Benefit Evaluation of Billing-center System (1996-2000)

Year	1996	1997	1998	1999	2000	Total (1996-2000)
Subscribers (thousand)	1,032.80	1,237.80	1,442.90	1,648.00	1,854.20	
Anticipated bill-issuance delay (month)	0.1	0.7	1.3	1.9	2.6	
(A) Amount due to be collected originally ((a)+(b)) (MSP)	7,098.61	8,899.57	10,853.96	12,972.13	15,274.91	
(a) Call charge (MSP)	6,540.90	8,231.16	10,074.79	12,082.21	14,273.65	
(b) Subscription fee (MSP)	557.71	668.41	779.17	889.92	1,001.27	
(B) Amount collected practically (MSP)	7,039.45	8,439.58	10,197.25	12,094.05	14,019.27	
(C) Shortage of amount collected ((A)-(B))	59.16	459.99	656.7	878.07	1,255.64	
(D) Shortage of amount for the year (after paying debt of the previous year)	59.16	524.47	1,228.37	2,217.00	3,672.17	
(E) Annual financial loss (interest)((D)*9%) (MSP)	5.32	47.2	110.55	199.53	330.5	
(Million U.S. Dollars)	0.13	1.12	2.63	4.75	7.87	
(F) Sum total of financial loss (interest) (MSP)	5.32	52.53	163.08	362.61	693.1	
(Million U.S. Dollars)	0.13	1.25	3.88	8.63	16.5	16.5

Table 12 Benefit Evaluation of Billing-center System (2001-2005)

Year	2001	2002	2003	2004	2005	Total (2001-2005)
Subscribers (thousand)	1,879.90	1,907.90	1,935.90	1,965.00	1,993.70	
Anticipated bill-issuance delay (month)	2.6	2.7	2.8	2.9	3	
(A) Amount due to be collected originally ((a)-(b)) (MSP)	16,210.20	17,222.72	18,296.98	19,447.56	20,664.35	
(a) Call charge (MSP)	15,195.06	16,192.45	17,251.59	18,386.46	19,587.75	
(b) Subscription fee (MSP)	1,015.15	1,030.27	1,045.39	1,061.10	1,076.60	
(B) Amount collected practically (MSP)	16,007.56	16,859.82	17,902.79	19,017.03	20,198.09	
(C) Shortage of amount collected ((A)-(B))	202.65	362.9	394.18	430.53	466.26	
(D) Shortage of amount for the year (after paying debt of the previous year)	4,205.32	4,946.69	5,786.08	6,737.36	7,809.98	
(E) Annual financial loss (interest)((D)*9%) (MSP)	378.48	445.2	520.75	606.36	702.9	
(Million U.S. Dollars)	9.01	10.6	12.4	14.44	16.74	
(F) Sum total of financial loss (interest) (MSP)	1,071.58	1,516.79	2,037.53	2,643.90	3,346.79	
(Million U.S. Dollars)	25.51	36.11	48.51	62.95	79.69	63.2

Table 12 Benefit Evaluation of Billing-center System (2001-2005)

Year	2006	2007	2008	2009	2010	Total (2006-2010)
Subscribers (thousand)	2,023.90	2,053.90	2,083.90	2,115.20	2,146.00	
Anticipated bill-issuance delay (month)	3.1	3.2	3.3	3.3	3.4	
(A) Amount due to be collected originally ((a)+(b)) (MSP)	21,971.59	23,356.68	24,826.47	26,402.22	28,068.06	
(a) Call charge (MSP)	20,878.69	22,247.58	23,701.16	25,260.01	26,909.22	
(b) Subscription fee (MSP)	1,092.91	1,109.11	1,125.31	1,142.21	1,158.84	
(B) Amount collected practically (MSP)	21,461.69	22,804.23	24,227.64	25,968.88	27,376.05	
(C) Shortage of amount collected ((A)-(B))	509.91	552.45	598.83	433.33	692.01	
(D) Shortage of amount for the year (after paying debt of the previous year)	9,022.79	10,387.29	11,920.98	13,427.20	15,327.65	
(E) Annual financial loss (interest)((D)*9%) (MSP)	812.05	934.86	1,072.89	1,208.45	1,379.49	
(Million U.S. Dollars)	19.33	22.26	25.54	28.77	32.84	
(F) Sum total of financial loss (interest) (MSP)	4,158.84	5,093.70	6,166.59	7,375.04	8,754.53	
(Million U.S. Dollars)	99.02	121.28	146.82	175.6	208.44	128.8

3. Total Benefits of Computerized System

The total benefits of computerized system for each Five Year Plan are shown below, and totally they amount to more than 200 million dollars.

Table 12. Total benefits of Computerized System

	1996~2000	2001~2005	2006~2010	Total
Telephone-center System	0.2	-	-	0.2
Billing-center System	16.5	63.2	128.8	208.5
Total	16.7	63.2	128.8	208.7

(Million U.S. Dollar)

Tentative Cash Flow Table(including computer's benefit)

Year	Number of Subscribers	Total Revenue [A]	Investment	Operation & Maintenance Cost	Working Capital	Total Expense [B]	Net Inflow [A] - [B]
1996	204,000	53,138,000	132,183,063	19,449,360	15,941,400	167,573,823	-114,435,823
1997	409,000	99,160,500	132,183,063	38,994,060	29,748,150	200,925,273	-101,764,773
1998	614,000	145,183,000	132,183,063	58,538,760	43,554,900	234,276,723	-89,093,723
1999	819,000	191,205,500	132,183,063	78,083,460	47,801,375	258,067,898	-66,862,398
2000	1,024,000	276,856,800	132,183,063	97,628,160	69,214,200	299,025,423	-22,168,623
2001	1,051,000	299,263,200	55,885,120	100,202,340	74,815,800	230,903,260	68,359,940
2002	1,079,000	306,632,800	55,885,120	102,871,860	76,658,200	235,415,180	71,217,620
2003	1,107,000	314,002,400	55,885,120	105,541,380	78,500,600	239,927,100	74,075,300
2004	1,136,000	321,635,200	55,885,120	108,306,240	80,408,800	244,600,160	77,035,040
2005	1,165,000	329,268,000	55,885,120	111,071,100	82,317,000	249,275,220	79,994,780
2006	1,195,000	344,784,000	31,612,805	113,931,300	86,196,000	231,740,105	113,043,895
2007	1,225,000	352,680,000	31,612,805	116,791,500	88,170,000	236,574,305	116,105,695
2008	1,255,000	360,576,000	31,612,805	119,651,700	90,144,000	241,408,505	119,167,495
2009	1,286,000	368,735,200	31,612,805	122,607,240	92,183,800	246,403,845	122,331,355
2010	1,317,000	376,894,400	31,612,805	125,562,780	94,223,600	251,399,185	125,495,215
2011	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2012	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2013	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2014	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2015	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2016	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2017	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2018	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2019	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020
2020	1,317,000	376,894,400	0	125,562,780	94,223,600	219,786,380	157,108,020

FIRR = 16.21% (Tentative)

SUPPORTING 1-13 TARIFF PLAN



SI-13-1

Price Comparison / Basket of Goods



S1-13-1 Price Comparison/Basket of Goods

PRICE COMPARISON/ BASKET OF GOODS

(Prices in Syrian Pounds (SP), average market prices in Damascus)

Monthly rental of appartement/ 5 persons household:

- in suburban area of Damascus:	3,000 SP
- in area around city of Damascus:	5,000 SP
- in city of Damascus:	10,000 - 30,000 SP
- TV-set medium size(Syronics, local production):	20,000 SP
- Telephone set:	800 - 2000 SP
- Facsimile machine:	30,000 SP
- Computer office equipment incl. laser printer:	180,000 SP
- Gasoline 1 litre:	22 SP
- Heating oil 1 litre:	7 SP
- Bus ticket 50 Km	12 SP
- Taxi trip within Damascus	25 - 50 SP
- Cinema ticket:	25 SP
- Man's Haircut:	50 SP
- Shoes 1 pair men/ women:	600 SP
- Man's suit:	5,000 SP
- Man's shirt:	850 SP
- Bread 1 Kg:	7 SP
- Meat Beef 1 Kg:	200 SP:
- Meat Sheep 1 Kg:	300 SP
- Rice 1 Kg:	30 SP
- Sugar 1 Kg:	35 SP
- Coffee Arabic 1 Kg:	400 SP
- Tee 1 Kg:	175 SP
- Banana 1 Kg:	55 SP
- Lemon 1 Kg:	30 SP
- Vegetable 1 Kg:	10 - 30 SP
- Oliveoil 1 litre:	95 SP

(Exchange rate: 1US\$ = 42 SP)



S1-13-2

Defining the Erlang 1994



S1-13-2 Defining the Erlang 1994

Defining the Erlang 1994:	Erlang Peak in %		
Business	0.12		10%
Residential	0.07		10%
Assumed 1	Share in %	Erl. Damascus area	Orig. min. per line
Bus	40%	0.09	27 min. per day per line
Res	60%		
Assumed 2	Share in %	Erl. other areas	
Bus	20%	0.08	24 min./day/ line
Res	80%		
(Assumptions according to NTTI-Study 1993)			
Relation orig/ term traffic:	50%		
Relation main lines Damas/ other:	36%	% of Main lines in Damas in 1993	
Busy days in Syria	260		
Average Erlang Parameter Syria:	0.08362		25.09 min./day/ line 6522.29 min per year/line
Decrease of traffic due to line growth			-10%
Increase of traffic by economic growth (externalities etc.)			10%
Structure of Traffic 1994 in mio. minutes: (according to STE Statistics 1994)		in % of total	
Local call minutes (average call duration 3 min.)	3600		94.21%
National long distance minutes	167.5		4.38%
International minutes	53.8		1.41%
TOTAL	3821.3		100.00%



SI-13-3

Input Cost Single Line Unit



SI-13-3 Input Cost Single Line Unit

1. Input cost single line unit				
	direct cost	overhead *	O&M	Administr.
in %		25%		10%
switching	24	60		24
transmission	30	0		7
osp	45	0		45
	760	60		850
	* (overheads incl. planning and install.)			
No. of planned line units:	year	1996	1997	Input
		55000	58000	
2a. Input projected line unit in 1996				
	direct cost	overhead	O&M	Administr.
in %		25%		10%
switching	13,200,000	3,300,000	1,320,000	
transmission	3,850,000	0	385,000	
osp	24,750,000	0	2,475,000	1,650,000
	41,800,000	3,300,000		46,750,000
				850
2b. Input projected l. u. in 1997				
	direct cost	overhead	O&M	Administr.
in %		25%		10%
switching	13,920,000	3,480,000	1,392,000	
transmission	4,060,000	0	406,000	
osp	26,100,000	0	2,610,000	1,740,000
	44,080,000	3,480,000		49,300,000
				850



SI-13-4

Calculation of Marginal Cost



S1-13-4 Calculation of Marginal Cost

	A	B	C	D
10	<i>S1-13-4 Calculation of Marginal Cost</i>			
11				
12	<i>All figures in US\$</i>			
13				
14	<i>Common Marginal Network Access Cost (Installation)</i>			
15				
16				
17				
18				
19	Year		1996	1997
20	Time Index		0	1
21	Total Cost OSP		24,750,000	26,100,000
22	New Lines Installed		55,000	58,000
23	New Working Lines	100.00%	55,000	58,000
24	Investment/Working Line		450.00	450.00
25				
26	MC of Investment	6.67%	30.00	30.00
27	Interest (18% devaluation +4% bondrate)	22.00%	49.50	49.50
28	Total Planning Cost and Installation Cost - OSI	0.00%	0	0
29	MC of Planning Cost	6.67%	0.00	0.00
30				
31	O & M Cost	10.00%	2,475,000	2,610,000
32	MC of O & M Cost		3.00	3.00
33				
34	<i>CMC/Line (in US\$)</i>		<i>82.50</i>	<i>82.50</i>
35				
36				
37	<i>Common Marginal Network Access Cost (Annual Rent)</i>			
38				
39	Year		1996	1997
40	Time Index		0	1
51	Investment Switching	33.33%	4,399,956	4,639,954
52	Investment/Working Line		80.00	80.00
53				
54	MC of Switching/ Depr.	10.00%	8.00	8.00
55	Interest (18% devaluation +4% bondrate)	22.00%	8.80	8.80
56				
57	O & M Cost	10.00%	439,996	463,995
58	MC of O & M Cost		0.80	0.80
59				
60	<i>CMC/Line (in US\$)</i>		<i>17.60</i>	<i>17.60</i>
61				
62				

S1-13-4 Calculation of Marginal Cost

	A	B	C	D
63			1996	1997
64	Transmission Cost:			
65	Investment-microwave incl. overheads		3,850,000	4,060,000
66	Investment-satellite		0	0
67	Additional planning Cost	0.00%	0	0
68	O & M:	10.00%	385,000	406,000
69	Intelsat leasing charges		0	0
70				
71	Distribution of Transmission Cost:			
72	local	0%		
73	long distance 1	12.50%	up to 80 km	
74	long distance 2	25.00%	80 to 160 Km	
75	long distance 3	37.50%	more than 160 km	
76	International	25.00%		
77		100%		
78	Switching Cost:			
79	Investment Cost		13,200,000	13,920,000
80	Additional planning Cost:	25.00%	3,300,000	3,480,000
81	O & M:	10.00%	1,320,000	1,392,000
82				
83	100.00%	Traffic / sub	1996	1997
84	Minutes per subscriber:	6,522.29	55,000	58,000
85	Local	94.21%	337,951,105	356,384,802
86	Long distance zone 1	2.19%	7,862,057	8,290,896
87	Long distance zone 2	1.46%	5,241,371	5,527,264
88	Long distance zone 3	0.73%	2,620,686	2,763,632
89	internat. zone 1	0.19%	682,644	719,879
90	internat. zone 2	0.07%	263,928	278,324
91	internat. zone 3	0.57%	2,053,471	2,165,478
92	internat. zone 4	0.27%	974,234	1,027,374
93	internat. zone 5	0.02%	76,853	81,045
94	internat. zone 6	0.26%	940,855	992,174
95	internat. zone 7	0.02%	58,508	61,699

SI-13-4 Calculation of Marginal Cost

	A	B	C	D
96	<i>Marginal Transmission Cost Long Distance Calls</i>			
97				
98	Year		1996	1997
99	Time Index		0	1
100				
101	Zone 1			
102	Investment Transmission	13%	481,250	507,500
103	Minutes		7,862,057	8,290,896
104	Investment/Minute		0.061212	0.061212
105				
106	Depreciation	10.00%	0.006121	0.006121
107	Interest	22.00%	0.006733	0.006733
108	O & M	10.00%	0.000612	0.000612
109				
110	<i>MC/Minute</i>		<i>0.013467</i>	<i>0.013467</i>
111				
112				
113	Zone 2			
114	Investment Transmission	25%	962,500	1,015,000
115	Minutes		5,241,371	5,527,264
116	Investment/Minute		0.183635	0.183635
117				
118	Depreciation	10.00%	0.018364	0.018364
119	Interest	22.00%	0.020200	0.020200
120	O & M	10.00%	0.001836	0.001836
121				
122	<i>MC/Minute</i>		<i>0.04039973</i>	<i>0.04039973</i>
123				
124				
125	Zone 3			
126	Investment Transmission	38%	1,443,750	1,522,500
127	Minutes		2,620,686	2,763,632
128	Investment/Minute		0.550905	0.550905
129				
130	Depreciation	10.00%	0.055091	0.055091
131	Interest	22.00%	0.060600	0.060600
132	O & M	10.00%	0.005509	0.005509
133				
134	<i>MC/Minute</i>		<i>0.121199</i>	<i>0.121199</i>
135				

S1-13-4 Calculation of Marginal Cost

	A	B	C	D
136	<i>Marginal Transmission Cost International Calls</i>			
137				
138	Year		1996	1997
139	Time Index			
140				
141	Investment Transmission	25%	962,500	1,015,000
142	Investment Transmission-Satellite Station		0	0
143	Minutes		1,005,080	1,059,902
144	Investment /Minute		0.957636	0.957636
145	Investment-Sat. Station/Minute		0.000000	0.000000
146				
147	Depreciation Transmission	10.00%	0.095764	0.095764
148	Depreciation-Sat. Station	0.00%	0.000000	0.000000
149	Interest	22.00%	0.105340	0.105340
150	Interest-Sat. Station	0.00%	0.000000	0.000000
151	O & M	10.00%	0.009576	0.009576
152	O & M-Sat. Station	0.00%	0.000000	0.000000
153				
154	International Settlement Rate / min (Zone 1)		0.39	0.39
155	International Settlement Rate / min (Zone 2)		0.69	0.69
156	International Settlement Rate / min (Zone 3)		0.79	0.79
157	International Settlement Rate / min (Zone 4)		1.18	1.18
158	International Settlement Rate / min (Zone 5)		1.38	1.38
159	International Settlement Rate / min (Zone 6)		1.77	1.77
160	International Settlement Rate / min (Zone 7)		2.37	2.37
161	MC/Minute (zone 1)		0.600680	0.600680
162	MC/Minute (zone 2)		0.900680	0.900680
163	MC/Minute (zone 3)		1.000680	1.000680
164	MC/Minute (zone 4)		1.390680	1.390680
165	MC/Minute (zone 5)		1.590680	1.590680
166	MC/Minute (zone 6)		1.980680	1.980680
167	MC/Minute (zone 7)		2.580680	2.580680

SI-13-4 Calculation of Marginal Cost

	A	B	C	D
168	<i>Marginal Switching Cost Local</i>			
169				
170	Year		1996	1997
171	Time Index		0	1
172				
173	Investment Switching	66.67%	7,783,185	8,207,722
174	Minutes		337,951,105	356,384,802
175	Investment/Minute		0.023031	0.023031
176				
177	Depreciation	10.00%	0.002303051	0.002303051
178	Interest	22.00%	0.002533356	0.002533356
179	O & M	10.00%	0.0002303	0.0002303
180				
181	<i>MC/Minute</i>		<i>0.00506671</i>	<i>0.00506671</i>
182				
183	<i>Marginal Switching Cost Long Distance Zone 1 and 2</i>			
184				
185	Year		1996	1997
186	Time Index			
187				
188	Investment Switching	66.67%	603,557	636,478
189	Minutes		13,103,428	13,818,161
190	Investment/Minute		0.046061	0.046061
191				
192	Depreciation	10.00%	0.004606	0.004606
193	Interest	22.00%	0.005067	0.005067
194	O & M	10.00%	0.0004606	0.0004606
195				
196	<i>MC/Minute</i>		<i>0.010133</i>	<i>0.010133</i>
197				
198	<i>Marginal Switching Cost Long Distance Zone 3</i>			
199				
200	Year		1996	1997
201	Time Index		0	1
202				
203	Investment Switching	66.67%	181,067	190,944
204	Minutes		2,620,686	2,763,632
205	Investment/Minute		0.069092	0.069092
206				
207	Depreciation	10.00%	0.006909152	0.006909152
208	Interest	22.00%	0.007600067	0.007600067
209	Planning / O & M	10.00%	0.0006909	0.0006909
210	<i>MC/Minute</i>		<i>0.01520013</i>	<i>0.01520013</i>

SI-13-4 Calculation of Marginal Cost

	A	B	C	D
211	<i>Marginal Switching Cost International</i>			
212				
213	Year		1996	1997
214	Time Index		0	1
215				
216	Investment Switching	66.67%	232,631	245,320
217	Minutes		5,050,492	5,325,973
218	Investment/Minute		0.046061	0.046061
219				
220	Depreciation	10.00%	0.004606101	0.004606101
221	Interest	22.00%	0.005066711	0.005066711
222	O & M	10.00%	0.0004606	0.0004606
223				
224	<i>MC/Minute</i>		<i>0.01013342</i>	<i>0.01013342</i>
225				
226				

SI-13-4 Calculation of Marginal Cost

	A	B	C	D
227	Table 18: Marginal Cost of Network			
228				
229	Marginal Cost		1996	1997
230	Common Marginal Network Access Cost (Installation)		82.500	82.500
231	Common Marginal Network Access Cost (Annual Rent)		17.600	17.600
232	Marginal Cost Local Calls		0.0051	0.0051
233	Marginal Cost Long Distance Calls 1		0.024	0.024
234	Marginal Cost Long Distance Calls 2		0.051	0.051
235	Marginal Cost Long Distance Calls 3		0.136	0.136
236	Marginal Cost International Zone 1		0.611	0.611
237	Marginal Cost International Zone 2		0.911	0.911
238	Marginal Cost International Zone 3		1.011	1.011
239	Marginal Cost International Zone 4		1.401	1.401
240	Marginal Cost International Zone 5		1.601	1.601
241	Marginal Cost International Zone 6		1.991	1.991
242	Marginal Cost International Zone 7		2.591	2.591



SI-13-5

Tariff Model



S1-13-5 Tariff Model

	A	B	C	D
2	<i>Tariff Model for Installation & Annual Rent 1996</i>			
3				
4			Telephone Installation	Telephone Annual rent
5			(Residential)	(Mixed Bus:Res)
6	Total		95.24	12.11
7	Price p¥ (US\$)		55,000	740,000
8	Demand X¥ (base year 1994 + exp. t+1)	740,000	0.05	0.05
9	Elasticity e¥		82.50	17.60
10	Marginal cost c¥ (in US\$)		4,537,500	13,023,870
11	Variable cost Cv¥ (in US\$)	17,561,370	5,238,200	8,961,400
12	Revenue R¥ (in US\$) (Current tariffs)	14,199,600	52,382,000	89,614,000
13	Current Consumer surplus CSi (in US\$)	141,996,000		
14				
15	Demand functions		x=B-bp	x=B-bp
16	Parameter b		28,874,225	3055,326177
17	Parameter B		57750	777000
18				
19	Theoretical price maximum (in US\$)		2000.04	254.31
20	Profit maximizing price (US\$)		1041.27	135.95
21				
22	Ramseyfactor a	0.021311083		
23	Ramsey-price p (in US\$)		122.51	22.54
24	Change in price (in%)		29%	86%
25	Ramsey-demand X	762,348	54,213	708,136
26	Change in demand (in %)	3.02%	-1.43%	-4.31%
27	New price elasticity e		0.07	0.10
28	Variable cost Cv (in US\$)	16,935,597	4,472,534	12,463,063
29	Revenue R (in US\$) (Ramsey)	22,602,443	6,641,694	15,960,749
30	New Consumer surplus CSi (in US\$)	132,955,385	50,892,770	82,062,615
31	Change in consumer surplus (in%)	-6.37%	-2.84%	-8.43%

S1-13-5 Tariff Model

	A		B	C	D
	Tariff Model for Local Telephone Calls, 1996				
		Local	Peak	Local	Local
			Off peak		
33	Total		0.002381		0.002381
34	Price p* (US\$/min.)				
35	Subscriber	740,000			
36	Traffic	6,522.29	65.95%		28.26%
37	Demand X* (in min.)	4,826,494.600	3,182,887.078		1,364,094.462
38	Elasticity e*		0.05		0.15
39	Marginal cost c* (in US\$)		0.005067		0.000
40	Variable cost Cv* (in US\$)		16,126.770		0
41	Revenue r* (in US\$) (Current tariffs)	107,764,859	7,578,303		3,247,844
42	Revenues/Current Settlements Inc. Int'l.	124,069,712	0		0
43	Current Consumer surplus CSi (in US\$)	116,819,980	75,783,026		10,826,147
44	Demand functions	163,733,175			
45	Parameter b		x=B-bp		x=B-bp
46	Parameter B		66,840,628.643		85,937,951.112
47	Theoretical price maximum (in US\$/min.)		0.05		0.02
48	Profit maximizing price (US\$/min.)		0.03		0.01
49	Ramsey factor a		0.0060		0.0004
50	Ramsey-price p (in US\$/min.)		152%		-84%
51	Change in price (in %)		2,940,699.765		1,535,975.333
52	Ramsey-demand X (in min.)	4,769,828,502	-7.61%		12.60%
53	Change in demand (in %)	-1.17%	0.14		0.02
54	New price elasticity e		111,311,776		14,899,677
55	Variable cost Cv (in US\$)		118,952,199		17,656,865
56	Revenue R (in US\$) (Ramsey)		125,305,792		585,045
57	Revenues/Ramsey Settlements Inc. Int'l.		179,259,379		13,726,300
58	New Consumer surplus CSi (in US\$)		9.48%		-14.64%
59	Change in consumer surplus (in %)				26.79%

S1-13-5 Tariff Model

	E	F	G	H	I	J	K
33	Tariff Model for Long Distance National Telephone Calls 1996						
34	Long Distance 1 (old 0 and 1)						
35	Peak	Off peak	Peak	Off peak	Peak	Off peak	Peak
36							
37							
38	Price p ₁ (US\$/min.)	0.024	0.012	0.045	0.023	0.089	0.045
39	subscriber traffic						
40		1.53%	0.66%	1.02%	0.44%	0.51%	0.22%
41	Demand X ₁ (in min.)	74,046,331	31,734,142	49,364,221	21,156,095	24,682,110	10,578,047
42	Elasticity e ₁	0.1	0.3	0.2	0.3	0.3	0.5
43	Marginal cost c ₁ (in US\$)	0.024	0.000	0.051	0.000	0.136	0.000
44	Variable cost CV ₁ (in US\$)	1,747,493	0	2,494,530	0	3,366,623	0
45	Revenue r ₁ (in US\$) (Current tariffs)	1,777,112	380,810	2,221,390	476,012	2,196,708	470,723
46	Revenues/Current Settlements Inc. Intl.	0	0	0	0	0	0
47	Current Consumer surplus CSI (in US\$)	8,885,560	634,683	5,553,475	793,354	3,661,180	470,723
48							
49	Demand functions	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp
50	Parameter b	308,526,381	793,353,550	219,396,537	282,081,262	83,198,125	118,854,464
51	Parameter B	81,450,964	41,254,385	59,237,065	27,502,923	32,086,744	15,867,071
52							
53	Theoretical price maximum (in US\$/min.)	0.26	0.05	0.27	0.10	0.39	0.13
54	Profit maximizing price (US\$/min.)	0.14	0.03	0.16	0.05	0.26	0.07
55							
56	Ramsey factor a						
57	Ramsey-price p (in US\$/min.)	0.0286	0.0011	0.0551	0.0020	0.1416	0.0028
58	Change in price (in %)	19%	-91%	22%	-91%	59%	-94%
59	Ramsey-demand X (in min.)	72,622,086	40,393,554	47,145,543	26,929,036	20,305,836	15,555,982
60	Change in demand (in %)	-1.92%	27.29%	-4.49%	27.29%	-17.73%	46.87%
61	New price elasticity e	0.12	0.02	0.26	0.02	0.58	0.02
62	Variable cost CV (in US\$)	1,713,881	0	2,382,413	0	2,769,702	0
63	Revenue R (in US\$) (Ramsey)	2,078,174	43,829	2,598,315	54,786	2,875,319	43,278
64	Revenues/Ramsey Settlements Inc. Intl.	0	0	0	0	0	0
65	New Consumer surplus CSI (in US\$)	8,547,028	1,028,318	5,065,491	1,285,397	2,477,982	1,015,388
66	Change in consumer surplus (in %)	-3.81%	62.02%	-8.79%	62.02%	-32.32%	115.71%

S1-13-5 Tariff Model

	L	M	N	O	P	Q	R
33	Tariff Model for International Telephone Calls Zone 1 - 3, 1996						
34	International 1			International 2			International 3
35	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Off Peak
36							
37							
38	Price p (US\$/min.)	0.833	0.417	1.190	0.595	1.548	0.774
39	Subscriber						
40	Traffic	0.11%	0.08%	0.04%	0.03%	0.29%	0.29%
41	Demand X# (in min.)	5,510,802	3,673,868	2,130,621	1,420,414	13,814,267	13,814,267
42	Elasticity e _x	0.6	0.8	0.7	0.9	0.8	1
43	Marginal cost c _x (in US\$)	0.611	0.611	0.911	0.911	1.011	1.011
44	Variable cost Cv# (in US\$)	3,366,071	2,244,047	1,940,598	1,293,732	13,963,645	13,963,645
45	Revenue r# (in US\$) (Current tariffs)	4,590,498	1,530,166	2,535,439	845,146	21,384,486	10,692,243
46	Revenues/Current Settlements Inc. Int'l.	3,637,407	2,424,938	2,488,100	1,658,733	18,470,024	18,470,024
47	Current Consumer surplus CSI (in US\$)	3,825,415	956,354	1,811,028	469,526	13,365,304	5,346,121
48							
49	Demand functions	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp
50	Parameter b	3,969,365	7,056,649	1,253,306	2,148,525	7,139,156	17,847,890
51	Parameter B	8,817,283	6,612,962	3,622,055	2,698,786	24,865,681	27,628,534
52							
53	Theoretical price maximum (in US\$/min.)	2.22	0.94	2.89	1.26	3.48	1.55
54	Profit maximizing price (US\$/min.)	1.42	0.77	1.90	1.08	2.25	1.28
55							
56	Ramsey factor a						
57	Ramsey-price p (in US\$/min.)	0.6444	0.6176	0.9521	0.9180	1.0624	1.0220
58	Change in price (in %)	-23%	48%	-20%	54%	-31%	32%
59	Ramsey-demand X (in min.)	6,259,349	2,254,619	2,428,768	726,401	17,281,049	9,387,590
60	Change in demand (in %)	13.58%	-38.63%	13.99%	-48.86%	25.10%	-32.04%
61	New price elasticity e	0.41	1.93	0.49	2.72	0.44	1.94
62	Variable cost Cv (in US\$)	3,823,293	1,377,151	2,212,154	661,615	17,467,914	9,489,101
63	Revenue R (in US\$) (Ramsey)	4,033,643	1,392,503	2,312,458	666,849	18,359,368	9,594,328
64	Revenues/Ramsey Settlements Inc. Int'l.	4,131,395	1,488,130	2,836,208	848,259	23,104,694	12,551,171
65	New Consumer surplus CSI (in US\$)	4,935,228	360,179	2,353,340	122,795	20,915,264	2,468,831
66	Change in consumer surplus (in %)	29.01%	-62.34%	29.95%	-73.85%	56.49%	-53.82%

S1-13-5 Tariff Model

S	T	U	V	W	X	Y	Z	AA
33	Tariff Model for International Telephone Calls Zone 4 - 7, 1996							
34	International 4							
35	International 5							
36	International 6							
37	International 7							
38	Price p (US\$/min.)	2.381	1.191	2.738	1.369	2.976	1.488	2.381
39	Subscriber							
40	Traffic	0.19%	0.08%	0.015%	0.006%	0.18%	0.08%	0.01%
41	Demand X (in min.)	9,175,515	3,932,363	723,814	310,206	8,861,148	3,797,635	551,035
42	Elasticity e	0.9	1.1	1	1	1.1	1.1	1.2
43	Marginal cost c (in US\$)	1.401	1.401	1.601	1.601	1.991	1.991	2.591
44	Variable cost Cv (in US\$)	12,853,183	5,508,507	1,158,690	496,582	17,640,892	7,560,382	1,427,629
45	Revenue R (in US\$) (Current tariffs)	21,846,901	4,681,479	1,981,802	424,672	26,370,778	5,650,881	2,624,030
46	Revenues/Current Settlements Inc. Int'l.	18,324,197	7,853,227	1,690,512	724,505	26,544,575	11,376,247	2,210,244
47	Current Consumer surplus CSI (in US\$)	12,137,167	2,127,945	990,901	212,336	11,986,717	2,568,582	1,093,346
48								
49	Demand functions	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp	x=B-bp
50	Parameter b	3,468,275	3,633,431	264,359	226,593	3,275,290	2,807,391	138,858
51	Parameter B	17,433,478	8,257,963	1,447,627	620,412	18,608,412	7,975,034	1,212,277
52								
53	Theoretical price maximum (in US\$/min.)	5.03	2.27	5.48	2.74	5.68	2.84	8.73
54	Profit maximizing price (US\$/min.)	3.21	1.84	3.54	2.17	3.84	2.42	5.66
55								
56	Ramsey factor a							
57	Ramsey-price p (in US\$/min.)	1.4765	1.4190	1.6817	1.6245	2.0678	2.0085	2.7189
58	Change in price (in %)	-38%	19%	-39%	19%	-31%	35%	-43%
59	Ramsey-demand X (in min.)	12,312,676	3,102,096	1,003,062	252,302	11,835,689	2,336,253	834,733
60	Change in demand (in %)	34.19%	-21.11%	38.58%	-18.67%	33.57%	-38.48%	51.48%
61	New price elasticity e	0.42	1.66	0.44	1.46	0.57	2.41	0.45
62	Variable cost Cv (in US\$)	17,247,759	4,345,457	1,605,715	403,888	23,562,647	4,651,044	2,162,637
63	Revenue R (in US\$) (Ramsey)	18,179,289	4,401,898	1,686,824	409,875	24,474,118	4,692,477	2,269,575
64	Revenues/Ramsey Settlements Inc. Int'l.	24,588,807	6,194,984	2,342,664	589,254	35,454,376	6,998,359	3,348,104
65	New Consumer surplus CSI (in US\$)	21,855,529	1,324,230	1,902,972	140,464	21,384,906	972,091	2,508,961
66	Change in consumer surplus (in %)	80.07%	-37.77%	92.04%	-33.85%	78.41%	-62.15%	129.48%

SUPPORTING 2 FEASIBILITY STUDY

SUPPORTING 2-3 FUNDAMENTAL NETWORK PLAN

S2-3-1

Trunk Code Table for Damascus Local Connection

S2-3-1 Trunk Code Table for Damascus Local Connection(1/4)

2XX	0	1	2	3	4	5	6	7	8	9
0										
1	Kafr Souseh									
2	Al Nasser					Al Nasser				
3	Al Thawra					Al Thawra				
4										
5										
6										
7										
8	Ibn Alamed									
9										

3XX	0	1	2	3	4	5	6	7	8	9
0										
1	Dornar									
2	Al Hama									
3	Al Jalla					Al Jalla				
4										
5										
6										
7	Al Mohajrin									
8	Al Fegi									
9	Al Damas									

Existing Code New Code

S2-3-1 Trunk Code Table for Damascus Local Connection(2/4)

4XX	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4		Baghdad	Baghdad	Baghdad	Baghdad	Baghdad	Baghdad	Baghdad	Baghdad	Baghdad
5		Al Ahhsayeh								
6		Dawelah								
7		Jaber								
8										
9										

5XX	0	1	2	3	4	5	6	7	8	9
0										
1			Barzeh		Barzeh					
2			Zamalka							
3		Hirsa								
4			Bah Sharki							
5		Al Nashabsh								
6		Jaramana								
7						Dama				
8		Adraa	Dmser							
9		Al Taal			Al Taal	Sydnay				

Existing Code New Code

S2-3-1 Trunk Code Table for Damascus Local Connection(3/4)

0	1	2	3	4	5	6	7	8	9
0									
1		Mezzeh 1					Mezzeh 1		
2		Darvab							
3		Al Yamouk						Al Yamouk	
4	Bahla								
5									
6		Mezzeh 2					Mezzeh 2		
7	Schnavva								
8	JD Arouse	Katana							
9	Keswa								

0	1	2	3	4	5	6	7	8	9
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									

Existing Code New Code

S2-3-1 Trunk Code Table for Damascus Local Connection(4/4)

9XX	0	1	2	3	4	5	6	7	8	9
0										
1			Al Kadam							
2			Al Sabeemeh							
3										
4										
5										
6										
7										
8		Al Miedan			Al Miedan				Al Miedan	
9										

9XX	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Existing Code New Code

SUPPORTING 2-4 TELEPHONE NETWORK EXPANSION



S2-4-1

Local Network Traffic Matrix (erl)



S2-4-1 Local Network Traffic Matrix(eri)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1 Barze	0.00	33.13	44.81	26.16	3.18	3.12	0.55	1.13	0.38	0.52	0.40	0.62	0.52	0.66	0.78	0.92	1.06	1.20	1.34	1.48	1.62	1.76	1.90	2.04	2.18	2.32	2.46	2.60	2.74	2.88	3.02	3.16	3.30	3.44	3.58	3.72	3.86	4.00	4.14	4.28	4.42	4.56	4.70	4.84	4.98	5.12	5.26	5.40	5.54	5.68	5.82	5.96	6.10	6.24	6.38	6.52	6.66	6.80	6.94	7.08	7.22	7.36	7.50	7.64	7.78	7.92	8.06	8.20	8.34	8.48	8.62	8.76	8.90	9.04	9.18	9.32	9.46	9.60	9.74	9.88	10.02	10.16	10.30	10.44	10.58	10.72	10.86	11.00	11.14	11.28	11.42	11.56	11.70	11.84	11.98	12.12	12.26	12.40	12.54	12.68	12.82	12.96	13.10	13.24	13.38	13.52	13.66	13.80	13.94	14.08	14.22	14.36	14.50	14.64	14.78	14.92	15.06	15.20	15.34	15.48	15.62	15.76	15.90	16.04	16.18	16.32	16.46	16.60	16.74	16.88	17.02	17.16	17.30	17.44	17.58	17.72	17.86	18.00	18.14	18.28	18.42	18.56	18.70	18.84	18.98	19.12	19.26	19.40	19.54	19.68	19.82	19.96	20.10	20.24	20.38	20.52	20.66	20.80	20.94	21.08	21.22	21.36	21.50	21.64	21.78	21.92	22.06	22.20	22.34	22.48	22.62	22.76	22.90	23.04	23.18	23.32	23.46	23.60	23.74	23.88	24.02	24.16	24.30	24.44	24.58	24.72	24.86	25.00	25.14	25.28	25.42	25.56	25.70	25.84	25.98	26.12	26.26	26.40	26.54	26.68	26.82	26.96	27.10	27.24	27.38	27.52	27.66	27.80	27.94	28.08	28.22	28.36	28.50	28.64	28.78	28.92	29.06	29.20	29.34	29.48	29.62	29.76	29.90	30.04	30.18	30.32	30.46	30.60	30.74	30.88	31.02	31.16	31.30	31.44	31.58	31.72	31.86	32.00	32.14	32.28	32.42	32.56	32.70	32.84	32.98	33.12	33.26	33.40	33.54	33.68	33.82	33.96	34.10	34.24	34.38	34.52	34.66	34.80	34.94	35.08	35.22	35.36	35.50	35.64	35.78	35.92	36.06	36.20	36.34	36.48	36.62	36.76	36.90	37.04	37.18	37.32	37.46	37.60	37.74	37.88	38.02	38.16	38.30	38.44	38.58	38.72	38.86	39.00	39.14	39.28	39.42	39.56	39.70	39.84	39.98	40.12	40.26	40.40	40.54	40.68	40.82	40.96	41.10	41.24	41.38	41.52	41.66	41.80	41.94	42.08	42.22	42.36	42.50	42.64	42.78	42.92	43.06	43.20	43.34	43.48	43.62	43.76	43.90	44.04	44.18	44.32	44.46	44.60	44.74	44.88	45.02	45.16	45.30	45.44	45.58	45.72	45.86	46.00	46.14	46.28	46.42	46.56	46.70	46.84	46.98	47.12	47.26	47.40	47.54	47.68	47.82	47.96	48.10	48.24	48.38	48.52	48.66	48.80	48.94	49.08	49.22	49.36	49.50	49.64	49.78	49.92	50.06	50.20	50.34	50.48	50.62	50.76	50.90	51.04	51.18	51.32	51.46	51.60	51.74	51.88	52.02	52.16	52.30	52.44	52.58	52.72	52.86	53.00	53.14	53.28	53.42	53.56	53.70	53.84	53.98	54.12	54.26	54.40	54.54	54.68	54.82	54.96	55.10	55.24	55.38	55.52	55.66	55.80	55.94	56.08	56.22	56.36	56.50	56.64	56.78	56.92	57.06	57.20	57.34	57.48	57.62	57.76	57.90	58.04	58.18	58.32	58.46	58.60	58.74	58.88	59.02	59.16	59.30	59.44	59.58	59.72	59.86	60.00	60.14	60.28	60.42	60.56	60.70	60.84	60.98	61.12	61.26	61.40	61.54	61.68	61.82	61.96	62.10	62.24	62.38	62.52	62.66	62.80	62.94	63.08	63.22	63.36	63.50	63.64	63.78	63.92	64.06	64.20	64.34	64.48	64.62	64.76	64.90	65.04	65.18	65.32	65.46	65.60	65.74	65.88	66.02	66.16	66.30	66.44	66.58	66.72	66.86	67.00	67.14	67.28	67.42	67.56	67.70	67.84	67.98	68.12	68.26	68.40	68.54	68.68	68.82	68.96	69.10	69.24	69.38	69.52	69.66	69.80	69.94	70.08	70.22	70.36	70.50	70.64	70.78	70.92	71.06	71.20	71.34	71.48	71.62	71.76	71.90	72.04	72.18	72.32	72.46	72.60	72.74	72.88	73.02	73.16	73.30	73.44	73.58	73.72	73.86	74.00	74.14	74.28	74.42	74.56	74.70	74.84	74.98	75.12	75.26	75.40	75.54	75.68	75.82	75.96	76.10	76.24	76.38	76.52	76.66	76.80	76.94	77.08	77.22	77.36	77.50	77.64	77.78	77.92	78.06	78.20	78.34	78.48	78.62	78.76	78.90	79.04	79.18	79.32	79.46	79.60	79.74	79.88	80.02	80.16	80.30	80.44	80.58	80.72	80.86	81.00	81.14	81.28	81.42	81.56	81.70	81.84	81.98	82.12	82.26	82.40	82.54	82.68	82.82	82.96	83.10	83.24	83.38	83.52	83.66	83.80	83.94	84.08	84.22	84.36	84.50	84.64	84.78	84.92	85.06	85.20	85.34	85.48	85.62	85.76	85.90	86.04	86.18	86.32	86.46	86.60	86.74	86.88	87.02	87.16	87.30	87.44	87.58	87.72	87.86	88.00	88.14	88.28	88.42	88.56	88.70	88.84	88.98	89.12	89.26	89.40	89.54	89.68	89.82	89.96	90.10	90.24	90.38	90.52	90.66	90.80	90.94	91.08	91.22	91.36	91.50	91.64	91.78	91.92	92.06	92.20	92.34	92.48	92.62	92.76	92.90	93.04	93.18	93.32	93.46	93.60	93.74	93.88	94.02	94.16	94.30	94.44	94.58	94.72	94.86	95.00	95.14	95.28	95.42	95.56	95.70	95.84	95.98	96.12	96.26	96.40	96.54	96.68	96.82	96.96	97.10	97.24	97.38	97.52	97.66	97.80	97.94	98.08	98.22	98.36	98.50	98.64	98.78	98.92	99.06	99.20	99.34	99.48	99.62	99.76	99.90	100.04

62.	63.	64.	65.	66.	67.	68.	69.	70.	71.	72.	73.
Musala (Kahol)	Jalla	Uwiv	Damar	Mohaj	Mohaj	Mohaj	Mohaj	Mohaj	Mohaj	Mohaj	Mohaj
1.70	0.48	3.69	27.24	27.73	11.42	9.69	5.01	5.82	1.42	64.12	11.07
1.71	0.32	4.22	28.59	21.69	19.31	15.69	7.54	3.32	2.59	1.14	385.20
0.84	0.31	20.13	14.09	12.13	8.82	7.12	3.86	2.35	1.73	0.76	438.00
1.32	0.66	17.12	11.65	18.82	6.53	6.03	11.78	9.20	5.11	1.95	513.26
0.27	0.11	2.29	1.55	2.69	1.16	0.93	1.76	1.27	0.82	0.30	89.46
0.59	0.13	2.54	1.69	2.70	1.17	0.95	1.69	1.44	0.91	0.31	88.03
0.07	0.03	0.45	0.31	0.51	0.22	0.15	0.30	0.23	0.18	0.06	17.89
0.13	0.06	0.52	0.63	1.08	0.46	0.37	0.67	0.55	0.40	0.13	35.76
0.18	0.09	1.15	0.79	1.36	0.57	0.46	0.83	0.66	0.53	0.16	44.73
0.06	0.03	0.45	0.31	0.51	0.22	0.15	0.30	0.23	0.18	0.06	17.89
0.10	0.05	0.43	0.29	0.50	0.21	0.17	0.31	0.24	0.19	0.08	17.89
1.46	0.49	27.22	33.22	17.38	11.29	9.12	4.97	3.62	2.66	1.19	808.31
1.46	0.37	46.75	40.84	20.16	16.51	13.34	7.35	3.49	2.72	1.18	352.10
1.23	0.41	40.56	31.02	14.06	13.27	11.29	8.14	3.88	2.31	1.00	731.98
0.49	0.20	25.23	22.55	18.12	11.99	9.67	7.56	3.87	2.94	1.24	303.31
1.56	0.52	19.72	15.93	13.97	8.56	6.91	6.21	3.43	2.68	1.08	649.21
2.13	0.75	29.00	15.10	10.13	9.93	8.02	10.84	6.72	5.06	1.86	701.14
1.28	0.40	16.62	11.96	14.52	7.82	6.38	7.31	3.43	2.66	1.19	519.36
0.28	0.12	1.88	1.32	2.11	0.92	0.74	1.17	0.81	0.70	0.23	71.57
0.17	0.07	1.33	0.94	1.41	0.64	0.52	0.76	0.52	0.42	0.14	55.68
0.06	0.02	0.45	0.31	0.48	0.22	0.18	0.29	0.20	0.15	0.05	17.89
0.13	0.05	1.43	1.01	1.39	0.69	0.56	0.76	0.51	0.33	0.13	53.88
0.04	0.02	0.39	0.28	0.36	0.19	0.15	0.29	0.14	0.10	0.04	17.89
0.12	0.04	1.44	1.13	1.17	0.65	0.52	0.59	0.24	0.00	0.00	53.68
1.03	0.26	18.59	18.68	11.69	7.31	6.07	4.23	3.11	1.81	0.75	530.14
0.51	0.13	9.22	8.27	5.89	3.72	3.09	2.14	1.05	0.50	0.27	274.31
0.51	0.13	9.22	8.27	5.89	3.72	3.09	2.14	1.05	0.50	0.27	274.31
3.66	0.76	13.79	18.19	45.46	41.63	33.63	13.79	5.97	5.13	2.29	173.29
1.42	0.46	32.43	35.52	17.83	12.80	10.43	6.35	3.08	2.36	1.07	304.05
0.81	0.22	11.61	9.59	8.46	4.97	4.02	3.44	1.78	1.50	0.61	389.52
0.32	0.13	2.61	1.89	2.63	1.24	1.09	1.32	0.82	0.70	0.25	97.05
0.06	0.02	0.26	0.13	0.49	0.22	0.18	0.25	0.17	0.14	0.05	17.89
0.21	0.09	3.36	1.94	3.01	1.10	0.89	0.86	0.46	0.39	0.15	89.46
0.21	0.09	3.36	1.94	3.01	1.10	0.89	0.86	0.46	0.39	0.15	89.46
2.08	0.48	33.68	26.31	22.43	14.30	11.51	7.57	3.43	3.13	1.31	841.23
2.16	0.49	27.03	20.78	13.64	13.23	6.81	3.52	3.59	1.37	0.41	511.23
2.11	0.46	22.94	16.99	20.80	10.53	8.51	7.04	3.53	3.01	1.30	711.40
2.87	0.62	22.17	18.95	22.34	10.46	8.45	8.29	3.65	3.05	1.49	391.56
1.01	0.26	11.98	9.48	9.61	5.27	4.26	3.77	1.91	1.72	0.69	389.52
0.82	0.22	3.26	2.35	4.05	1.62	1.31	1.37	0.99	1.15	0.49	144.87
0.11	0.04	0.75	0.54	0.78	0.50	0.29	0.37	0.22	0.21	0.07	26.54
0.38	0.15	1.44	0.98	1.84	0.71	0.59	0.97	0.52	0.68	0.22	53.68
0.07	0.03	0.49	0.35	0.52	0.24	0.19	0.27	0.16	0.16	0.06	17.89
0.16	0.03	0.50	0.35	0.52	0.24	0.19	0.27	0.16	0.16	0.06	17.89
0.06	0.02	0.49	0.35	0.52	0.24	0.19	0.27	0.16	0.16	0.06	17.89
2.17	0.46	37.83	35.38	34.21	25.83	20.67	10.52	3.74	3.35	1.53	841.33
0.11	0.09	0.41	0.29	0.47	0.22	0.17	0.23	0.20	0.21	0.07	17.89
0.19	0.09	0.68	0.46	0.90	0.34	0.28	0.48	0.28	0.37	0.11	26.54
0.19	0.09	0.68	0.46	0.90	0.34	0.28	0.47	0.27	0.35	0.11	26.54
0.23	0.10	0.91	0.62	1.21	0.46	0.37	0.60	0.43	0.57	0.16	55.78
0.19	0.18	0.68	0.46	0.92	0.35	0.28	0.51	0.31	0.43	0.12	26.54
0.12	0.08	0.44	0.30	0.50	0.22	0.18	0.31	0.19	0.26	0.08	17.89
0.11	0.06	0.47	0.32	0.49	0.20	0.19	0.32	0.19	0.23	0.07	17.89
2.06	0.34	17.74	19.92	26.84	9.61	7.96	6.52	2.34	2.33	1.19	355.47
1.55	0.26	13.31	8.19	20.34	7.21	5.83	4.89	1.91	1.90	0.89	585.73
4.92	0.70	26.23	18.44	45.27	13.19	11.47	12.41	4.32	5.10	2.40	731.50
1.50	0.41	11.88	8.05	15.40	6.03	4.87	5.52	2.46	2.68	1.11	389.52
3.65	0.55	3.68	2.41	5.87	1.93	1.56	2.08	1.39	2.11	0.76	125.24
0.86	0.19	1.24	0.97	1.47	0.73	0.61	1.03	0.56	0.78	0.24	53.68
0.89	0.17	3.35	3.53	5.01	1.86	1.44	1.73	0.93	1.05	0.41	186.73
0.14	0.03	0.56	0.31	0.52	0.21	0.14	0.23	0.10	0.11	0.04	17.89
2.17	0.50	10.89	8.92	36.62	65.29	62.74	11.86	3.00	3.31	1.76	1077.41
1.40	0.33	8.02	6.00	21.51	22.45	18.14	6.80	3.00	2.48	1.11	824.00
3.71	0.72	36.67	21.51	10.89	26.18	20.34	22.24	6.72	6.66	3.31	721.82
1.15	0.26	65.29	32.45	23.18	10.89	16.34	6.35	2.45	2.92	0.96	491.74
0.93	0.21	52.74	18.14	20.34	26.34	10.60	5.05	1.98	1.63	0.78	492.33
1.71	0.45	11.06	6.30	22.24	6.35	5.05	10.46	6.53	4.99	3.73	285.65
0.72	0.29	4.62	3.04	6.25	2.35	1.98	5.53	0.69	5.12	1.16	141.76
1.01	0.52	3.81	2.48	6.08	2.03	1.63	3.09	3.12	1.04	0.64	153.48
0.42	0.14	1.29	1.11	1.33	0.66	0.53	0.73	0.39	0.46	0.16	17.89
71.67	12.89	107.74	83.60	87.84	461.74	402.74	285.65	121.52	122.58	60.83	1073.21



S2-4-2

Result of Long Distance Traffic Calculation





S2-4-3

TS Traffic Matrix in Damascus Area



S2-4-3 TS Traffic Matrix in Damascus Area

(Unit : Erlang)

Toll Switch	Damas. STD	Al Nabek	Zabadani	Quenneira	Darra	Sweda	Other STD	INT'L	MSC	Total
Damas. STD	-	144.96	130.73	16.19	165.44	113.59	-	-	-	570.91
Al Nabek	132.19	-	0.26	0.03	0.46	0.33	51.08	11.76	28.72	224.83
Zabadani	119.18	0.26	-	0.02	0.23	0.15	14.21	8.55	9.86	152.46
Quenneira	14.77	0.03	0.02	-	0.11	0.05	2.68	1.12	9.46	28.24
Darra	150.97	0.47	0.23	0.11	-	1.59	39.81	14.54	26.81	234.53
Sweda	103.70	0.33	0.15	0.05	1.59	-	24.72	9.82	23.65	164.01
Other STD	-	51.08	14.21	2.68	39.81	24.72	-	-	-	132.50
INT'L	-	11.76	8.55	1.12	14.54	9.82	-	-	-	45.79
MSC	-	67.02	23.02	22.08	62.55	55.19	-	-	-	229.86
Total	520.81	275.91	177.17	42.28	284.73	205.44	132.50	45.79	98.50	1,783.13



S2-4-4

Traffic Matrix Among STDs in Syria



S2-4-4 Traffic Matrix Among STDs in Syria

(Unit : Erlang)

STD	Damascus	Aleppo	Homs	Hama	Lattakia	INTL	MSC	Total
Damascus	-	940.61	429.94	184.06	389.31	692.63	394.21	3,030.76
Aleppo	940.58	-	112.05	84.09	179.11	164.46	141.91	1,622.20
Homs	429.93	112.05	-	49.95	46.27	55.50	55.19	748.89
Hama	184.06	84.09	49.95	-	31.67	30.41	39.42	419.60
Lattakia	389.30	179.11	46.27	31.67	-	61.57	157.68	865.60
INTL	692.63	164.46	55.50	30.41	61.57	-	8.00	1,012.57
MSC	919.82	331.13	128.77	91.98	367.92	18.60	-	1,858.22
Total	3,556.32	1,811.45	822.48	472.16	1,075.85	1,023.17	796.41	9,557.84



S2-4-5

Result of Long Distance Traffic Calculation



S2-4-5 Result of Long Distance Traffic Calculation

(eri)

Office Name	National			International			Mobile			Long Distance			TRF-Total	
	OC-TRF	IC-TRF	Total-TRF	OC-TRF	IC-TRF	Total-TRF	OC-TRF	IC-TRF	Total-TRF	OC-TRF	IC-TRF	Total-TRF	STD 1	STD 2
Al Nabsk	194,351	197,111	391,462	11,76	11,76	23,52	28,72	67,02	95,74	224,83	275,91	500,74	250,37	250,37
Zahedim	134,05	145,60	279,65	8,55	8,55	17,10	9,86	23,02	32,88	152,46	177,17	329,63	164,82	164,82
Quinnema	17,96	19,79	36,75	1,12	1,12	2,24	9,46	22,08	31,54	28,24	42,29	70,53	35,27	35,27
Dura	193,18	207,65	400,83	14,54	14,54	29,08	26,81	62,55	89,36	234,53	284,74	519,27	259,64	259,64
Sweida	130,54	140,43	270,97	9,82	9,82	19,64	23,65	55,19	78,84	164,01	205,44	369,45	184,73	184,73
Total	659,78	709,90	1,369,68	45,79	45,79	91,58	98,50	229,86	328,36	804,07	985,55	1,789,62	894,81	894,81



S2-4-6

Result of Long Distance Traffic Calculation



S2-4-6 Result of Long Distance Traffic Calculation

(eri)

Office Name	National			Mobile			Long Distance			TRF-Total	
	OG-TRF	IC-TRF	Total-TRF	OG-TRF	IC-TRF	Total-TRF	OG-TRF	IC-TRF	Total-TRF	STD 1	STD 2
Aleppo	940.58	940.61	1,881.19	141.91	331.13	473.04	1,082.49	1,271.74	2,354.23	1,177.12	1,177.12
Homs	429.93	429.94	859.87	55.19	128.77	183.96	485.12	558.71	1,043.83	521.92	521.92
Hama	184.06	184.06	368.12	39.42	91.98	131.40	223.48	276.04	499.52	249.76	249.76
Latakia	389.30	389.31	778.61	157.68	367.92	525.60	546.98	757.23	1,304.21	652.11	652.11
Total	1,943.87	1,943.92	3,887.79	394.20	919.80	1,314.00	2,338.07	2,863.72	5,201.79	2,600.90	2,600.90



S2-4-7

Result of Mobile Traffic Calculation



S2-4-7 Result of Mobile Traffic Calculation

(eri)

Office Name	Mobile				STD's TRF
	OG-TRF	IC-TRF	Total-TRF	STD's TRF	
STD 1	197.11	459.91	657.02	1,327.32	1,327.32
STD 2	197.11	459.91	657.02	1,327.32	1,327.32
Aleppo	141.91	331.13	473.04		
Homs	55.19	128.77	183.96		
Hama	39.42	91.98	131.40		
Lattakia	157.68	367.92	525.60		
INTS	8.00	18.60	26.60		
Total	788.41	1,839.62	2,654.63		2,654.63



S2-4-8

Result of International Traffic Calculation



S2-4-8 Result of International Traffic Calculation

(ert)

Office Name	International			TRF-Total		
	OG-TRF	IC-TRF	Total-TRF	INTS(DAMAS)	INTS(Aleppo)	
STD 1	346.32	346.32	692.63	415.58	277.05	
STD 2	346.32	346.32	692.63	415.58	277.05	
Aleppo	164.46	164.46	328.92	197.35	131.57	
Homs	55.50	55.50	111.00	66.60	44.40	
Hama	30.41	30.41	60.82	36.49	24.33	
Latakia	61.57	61.57	123.14	73.88	49.26	
Total	1,004.57	1,004.57	2,009.14	1,205.48	803.66	



S2-4-9

Local Network Circuit Matrix (Number of Circuits)



S2-4-10

Result of Long Distance Circuit Calculation





S2-4-11

Result of Long Distance Circuit Calculation



S2-11 Result of Long Distance Circuit Calculation

Office Name	National			International			Mobile			Long Distance			Total			Number of Circuits		
	IC-TRF	Total TRF	OG-TRF	IC-TRF	Total TRF	OG-TRF	IC-TRF	Total TRF	OG-TRF	IC-TRF	Total TRF	OG-TRF	IC-TRF	Total TRF	OG-TRF	STD.1	STD.2	STD.Total
Al Nohel	104.35	197.15	381.48	11.76	11.76	11.76	24.22	67.02	65.74	274.83	274.83	274.83	275.91	661.74	284.53	931	304	645
Zabulien	174.05	145.92	279.65	8.55	8.55	8.55	9.86	23.02	32.48	157.26	177.17	177.17	177.17	329.63	104.82	210	210	420
Qumayzi	17.66	19.98	36.74	1.12	1.12	1.12	0.60	32.08	31.54	26.24	26.24	26.24	42.29	70.53	35.23	60	60	120
Duwa	193.16	207.65	400.81	14.54	14.54	14.54	26.81	62.54	60.56	234.53	234.53	234.53	234.53	519.22	239.64	364	364	728
Sweid	130.34	144.45	274.87	9.65	9.65	9.65	23.63	45.19	39.84	164.01	164.01	164.01	208.24	384.25	184.75	210	210	420
Total	604.78	799.30	1,599.08	45.79	45.79	45.79	98.94	229.66	238.56	604.07	604.07	604.07	985.54	1,769.62	894.81	1,094	1,094	2,188



S2-4-12

Result of Long Distance Circuit Calculation



S2-4-12 Result of Long Distance Circuit Calculation

(cont)

Office Name	National			Mobile			Long Distance			TRF-Total			Number of Circuits		
	OG-TRF	IC-TRF	Total-TRF	OG-TRF	IC-TRF	Total-TRF	OG-TRF	IC-TRF	Total-TRF	STD 1	STD 2	Total-TRF	STD 1	STD 2	STD(Total)
Aleppo	940.58	940.61	1,881.19	141.91	331.13	473.04	1,082.49	1,271.74	2,354.23	1,177.12	1,177.12	2,354.23	1,230	1,230	2,460
Homs	429.93	429.94	859.87	55.19	128.77	183.96	485.12	558.71	1,043.83	521.92	521.92	1,043.83	570	570	1,140
Hama	184.06	184.06	368.12	39.42	91.98	131.40	223.48	276.04	499.52	249.76	249.76	499.52	300	300	600
Lattakia	389.30	389.31	778.61	157.68	367.92	525.60	546.98	757.23	1,304.21	652.11	652.11	1,304.21	690	690	1,380
Total	1,943.87	1,943.92	3,887.79	394.20	919.80	1,314.00	2,338.07	2,863.72	5,201.79	2,600.90	2,600.90	5,201.79	2,790	2,790	5,580



S2-4-13

Result of Mobile Circuit Calculation



S2-4-13 Result of Mobile Circuit Calculation

(ert)

Office Name	Mobile					No. of Circuits	
	OG-TRF	IC-TRF	Total-TRF	STD's TRF	MSC		
STD 1	197.11	459.91	657.02	1,327.32	1,380		
STD 2	197.11	459.91	657.02	1,327.32	1,380		
Aleppo	141.91	331.13	473.04				
Homs	55.19	128.77	183.96				
Hama	39.42	91.98	131.40				
Lattakia	157.68	367.92	525.60				
INTS	8.00	18.60	26.60				
Total	788.41	1,839.62	2,654.63	2,654.63	2,760		



S2-4-14

Result of International Circuit Calculation



S2-4-14 Result of International Circuit Calculation

(ert)

Office Name	International		TRF-Total				Number of Circuits		
	OG-TRF	IC-TRF	Total-TRF	INTS(DAMAS)	INTS(Aleppo)	INTS(DAMAS)	INTS(Aleppo)	INTS(Total)	
STD 1	346.32	346.32	692.63	415.58	277.05	450	300	750	
STD 2	346.32	346.32	692.63	415.58	277.05	450	300	750	
Aleppo	164.46	164.46	328.92	197.35	131.57	240	150	390	
Homs	55.50	55.50	111.00	66.60	44.40	90	60	150	
Hama	30.41	30.41	60.82	36.49	24.33	60	60	120	
Lattakia	61.57	61.57	123.14	73.88	49.26	90	90	180	
Total	1,004.57	1,004.57	2,009.14	1,205.48	803.66	1,380	960	2,340	

SUPPORTING 2-5 MOBILE TELEPHONE SYSTEM

S2-5-1

Radio Frequency Budget Calculation



S2 - 5 - 1 Radio frequency budget calculation

1) Cell Radius 1.5 km for Urban Area (3-sectored)

Item	unit	Downlink	Uplink
Transmit Frequency	MHz	942.5	897.5
Transmit Output Power (BTS, MS)	W	1	0.8
	dBm	30.0	29.0
Transmit Antenna Gain	dBi	17.1	-3.0
Antenna Beam Width	deg	120	360
TX Feeder Length	m	50.0	0
TX Feeder Loss(Lft)(IS-84-20D)	dB	2.5	0
Combiner, Filter, Connector Loss	dB	4.8	0
Correction by Downbeam Tilt	dB	0	0
TX Sub total	dB	39.8	26.0
BTS Antenna Height	m	40	40
MS Antenna Height	m	1.5	1.5
BTS Service Radius	km	1.5	1.5
Propagation Loss	dB	131.3	130.7
Receive Antenna Gain	dBi	-3.0	17.1
RX Feeder length	m	0	50.0
RX feeder Loss(Lfr)	dB	0	2.5
CNR Margin	dB	8.0	8.0
Combiner, Filter, Connector Loss	dB	0	4.8
RX Sub total	dB	-142.3	-128.9
RX Input Level	dBm	-102.5	-102.9
Required RX Input Level	dBm	-102.0	-104.0

120 deg
 40 Antenna Height (m)
 0.05 Cable loss/m (1V-20D)
 40 Ground elev. from MS (m)
 1.5 BTS Service Radius (km)
 Urban/Large city
 40 Antenna Height (m)
 0.05 Cable loss/m (1V-20D)

2) Cell Radius 3 km for Suburban Area (3-sectored)

Item	unit	Downlink	Uplink
Transmit Frequency	MHz	942.5	897.5
Transmit Output Power (BTS, MS)	W	3	0.8
	dBm	34.8	29.0
Transmit Antenna Gain	dBi	17.1	-3.0
Antenna Beam Width	deg	120	360
TX Feeder Length	m	50.0	0
TX Feeder Loss(Lft)(IS-84-20D)	dB	2.5	0
Combiner, Filter, Connector Loss	dB	4.8	0
Correction by Downbeam Tilt	dB	0	0
TX Sub total	dB	44.6	26.0
BTS Antenna Height	m	40	40
MS Antenna Height	m	1.5	1.5
BTS Service Radius	km	3.0	3.0
Propagation Loss	dB	131.6	131.1
Receive Antenna Gain	dBi	-3.0	17.1
RX Feeder length	m	0	50.0
RX feeder Loss(Lfr)	dB	0	2.5
CNR Margin	dB	8.0	8.0
Combiner, Filter, Connector Loss	dB	0	4.8
RX Sub total	dB	-142.6	-129.3
RX Input Level	dBm	-98.0	-103.3
Required RX Input Level	dBm	-102.0	-104.0

40 Antenna Height (m)
 0.05 Cable loss/m (1V-20D)
 40 Ground elev. from MS (m)
 3 BTS Service Radius (km)
 Suburban
 40 Antenna Height (m)
 0.05 Cable loss/m (1V-20D)

S2 - 5 - 1 Radio frequency budget calculation

3) Cell Radius 12 km for Quasi-Open Area (3-sectored)

Item	unit	Downlink	Uplink	
Transmit Frequency	MHz	942.5	897.5	
Transmit Output Power (BTS, MS)	W	2	2	
	dBm	33.0	33.0	
Transmit Antenna Gain	dB _i	17.1	2.0	
Antenna Beam Width	deg	120	360	
TX Feeder Length	m	60.0	4.0	50 Antenna Height (m)
TX Feeder Loss(Lfr)	dB	3.0	3.6	0.05 Cable loss/m (IV-20D)
Combiner, Filter, Connector Loss	dB	4.8	0	0.9 Cable loss (MS)
Correction by Downbeam Tilt	dB	0	0	
TX Sub total	dB	42.3	31.4	
BTS Antenna Height	m	50	50	50 Ground elev. from MS (m)
MS Antenna Height	m	1.5	1.5	
BTS Service Radius	km	12.0	12.0	12 BTS Service Radius (km)
Propagation Loss	dB	136.6	136.3	Quasi-Open
Receive Antenna Gain	dB _i	2.0	17.1	
RX Feeder length	m	4.0	60.0	50 Antenna Height (m)
RX feeder Loss(Lfr)	dB	3.6	3.0	0.05 Cable loss/m (IV-20D)
CNR Margin	dB	5.0	5.0	0 Cable loss (MS)
Combiner, Filter, Connector Loss	dB	0	4.8	
RX Sub total	dB	-143.2	-132.0	
RX Input Level	dBm	-100.9	-100.6	
Required RX Input Level	dBm	-104.0	-104.0	

4) Cell Radius 24 km for Quasi-Open Area (3-sectored)

Item	unit	Downlink	Uplink	
Transmit Frequency	MHz	942.5	897.5	
Transmit Output Power (BTS, MS)	W	5	5	
	dBm	37.0	37.0	
Transmit Antenna Gain	dB _i	17.1	2.0	
Antenna Beam Width	deg	120	360	
TX Feeder Length	m	60.0	4.0	50 Antenna Height (m)
TX Feeder Loss(Lfr)	dB	3.0	3.6	0.05 Cable loss/m (IV-20D)
Combiner, Filter, Connector Loss	dB	4.8	0	0.9 Cable loss (MS)
Correction by Downbeam Tilt	dB	0	0	
TX Sub total	dB	46.3	35.4	
BTS Antenna Height	m	70	70	70 Ground elev. from MS (m)
MS Antenna Height	m	1.5	1.5	
BTS Service Radius	km	24.0	24.0	24 BTS Service Radius (km)
Propagation Loss	dB	143.4	143.1	Quasi-Open
Receive Antenna Gain	dB _i	2.0	17.1	
RX Feeder length	m	4.0	60.0	50 Antenna Height (m)
RX feeder Loss(Lfr)	dB	3.6	3.0	0.05 Cable loss/m (IV-20D)
CNR Margin	dB	5.0	5.0	0.9 Cable loss (MS)
Combiner, Filter, Connector Loss	dB	0	4.8	
RX Sub total	dB	-150.0	-138.8	
RX Input Level	dBm	-103.8	-103.4	
Required RX Input Level	dBm	-104.0	-104.0	

S2 - 5 - 1 Radio frequency budget calculation

5) Cell Radius 24 km for Quasi-Open Area (2-directional)

Item	unit	Downlink	Uplink	
Transmit Frequency	MHz	942.5	897.5	
Transmit Output Power (BTS, MS)	W	10	5	
	dBm	40.0	37.0	
Transmit Antenna Gain	dBi	20.0	2.0	
Antenna Beam Width	deg	60	360	
TX Feeder Length	m	60.0	4.0	50 Antenna Height (m)
TX Feeder Loss(L.ft)	dB	3.0	3.6	0.05 Cable loss/m (1V-20D)
Combiner, Filter, Connector Loss	dB	4.8	0	0.9 Cable loss (MS)
Correction by Downbeam Tilt	dB	0	0	
TX Sub total	dB	52.2	35.4	
BTS Antenna Height	m	50	50	50 Ground elev. from MS (m)
MS Antenna Height	m	1.5	1.5	
BTS Service Radius	km	24.0	24.0	24 BTS Service Radius (km)
Propagation Loss	dB	146.8	146.4	Quasi-Open
Receive Antenna Gain	dBi	2.0	20.0	
RX Feeder length	m	4.0	60.0	50 Antenna Height (m)
RX Feeder Loss(L.fr)	dB	3.6	3.0	0.05 Cable loss/m (1V-20D)
CNR Margin	dB	5.0	5.0	0.9 Cable loss (MS)
Combiner, Filter, Connector Loss	dB	0	4.8	
RX Sub total	dB	-153.4	-139.2	
RX Input Level	dBm	-101.2	-103.9	
Required RX Input Level	dBm	-104.0	-104.0	

SUPPORTING 2-7 COMPUTER SYSTEM

S2-7-1

Number of Devices for Each Telephone Center



S2-7-1 Number of Devices for Each Telephone Center

1997

2.DAMASCUS(Rural Area)

NO	Center Name	Server	Terminal	Laser printer (for section)	Cash register	Printer (for bills)	Hub
1	Tall	1	10	11	2	2	3
2	Doma	1	10	11	3	3	3
3	Harsta	1	10	11	2	2	3
4	Daryah	1	10	11	1	1	2
5	Alhamah	1	10	11	1	1	2
6	Alnabek	1	10	11	2	2	3
7	Zamalka	1	10	11	2	2	3
8	Zabadani	1	10	11	3	3	3
	Subtotal	8	80	88	16	16	22

3.Aleppo

NO	Center Name	Server	Terminal	Laser printer (for section)	Cash register	Printer (for bills)	Hub
9	Aljamlecha	1	10	11	5	5	3
10	Alsabele	1	10	11	3	3	3
11	Kan-Alwazeer	1	10	11	4	4	3
12	Alsolymaneyeh	1	10	11	3	3	3
13	Hananow	1	10	11	4	4	3
14	Alansari	1	10	11	3	3	3
15	Alhandaneyeh	1	10	11	3	3	3
	Subtotal	7	70	77	25	25	21

1997 Total 15 150 165 41 41 43

**1998
4.HOMS**

NO	Center Name	Server	Terminal	Laser printer (for section)	Cash register	Printer (for bills)	Hub
16	Alkwatli	1	10	11	4	4	3
17	Almahita	1	10	11	4	4	3
18	Alwaer	1	10	11	4	4	3
Subtotal		3	30	33	12	12	9

5.HAMA

NO	Center Name	Server	Terminal	Laser printer (for section)	Cash register	Printer (for bills)	Hub
19	Hama	1	10	11	3	3	3
20	Kowatle	1	10	11	3	3	3
21	Salammeh	1	10	11	2	2	3
Subtotal		3	30	33	8	8	9

6.LATTAKIA

NO	Center Name	Server	Terminal	Laser printer (for section)	Cash register	Printer (for bills)	Hub
22	Lattakia	1	10	11	5	5	3
23	Teshreen	1	10	11	4	4	3
24	Kerdaha	1	10	11	2	2	3
25	Jableh	1	10	11	3	3	3
Subtotal		4	40	44	14	14	12

1998 Total 10 100 110 34 34 30

F/S TOTAL 25 250 275 75 75 73