Sprint

Charles J. Rehwinkel
Senior Attorney

Law/External Affairs
Post Office Box 2214
Tallahassee, FL 32316-2214
Mailstop FLTLHO0107
Voice 850 847 0244
Fax 850 878 0777
charles.j.rehwinkel@mail.sprint.com

ORIGINAL

Via Hand Delivery

July 10, 2000

Ms. Blanca S. Bayó, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

RECEIVED-FPSC
00 JUL 10 PM 1:19
RECORDS AND REPORTING

Re: Docket No. 990649-TP; Additional Supplemental Direct Testimony of Kent Dickerson and Further Additional Supplemental Direct Testimony of James W. Sichter.

Dear Ms. Bayó:

Enclosed for filing on behalf of Sprint are the original and fifteen (15) copies of Additional Supplemental Direct Testimony of Kent Dickerson and Further Additional Supplemental Direct Testimony of James W. Sichter. A portion of Mr. Dickerson's Exhibit KWD-5 is confidential and has been redacted for public filing. The confidential version has been filed under seal, subject to a Request for Confidential Classification. Service of the above testimonies has been made according to the attached certificate of service. Parties who have executed a Non-Disclosure agreement have been served an unredacted copy of the testimony.

Please acknowledge receipt and filing of the above by stamping the duplicate copy of this letter and returning the same to this writer.

APP
CAF
CMP
COM 5 forms
CTR
ECR
LEG 1
OPC
PAI
RGO
SEC 1
SER
OTH

Sincerely,

Charles J. Rehwinkel

CJR/th
Enclosures

Dickerson
DOCUMENT NUMBER-DATE
08300 JUL 10 00
FPSC-RECORDS/REPORTING

RECEIVED & FILED
FPSC-BUREAU OF RECORDS

Sichter
DOCUMENT NUMBER-DATE
08301 JUL 10 00
FPSC-RECORDS/REPORTING

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true copy of the foregoing has been furnished by e-mail transmission, U. S. Mail, or hand delivery (*) this 10th day of July 2000, to the following:

Beth Keating *
Division of Legal Services
Florida Public Service Comm.
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Nancy B. White
Bennett L. Ross
BellSouth Telecommunications
150 S. Monroe St., Suite 400
Tallahassee, FL 32301-1556

Karen F. Jusevitch
AT&T
101 N. Monroe Street, Suite 700
Tallahassee, FL 32301-1549

Steve Bowen/Jeremy Marcus
Blumenfeld & Cohen
1625 Massachusetts Ave., NW
Suite 300
Washington, DC 20036

Mark Rothschild
Swidler & Berlin Law Firm
3000 K Street, NW #300
Washington, DC 20007-5116

Jim Lamoureaux
AT&T Communications
1200 Peachtree Street, N.E.
Room 8068
Atlanta, GA 30309

Michael A. Gross
Florida Cable Telecommunications
Assoc., Inc.
310 N. Monroe Street
Tallahassee, FL 32301

Joseph McGlothlin
McWhirter, Reeves, et al.
117 South Gadsden Street
Tallahassee, FL 32301

Charles Pellegrini
Wiggins and Villacorta
2145 Delta Blvd., Suite 200
Tallahassee, FL 32303

Catherine F. Boone
COVAD
10 Glenlake Parkway
Suite 650
Atlanta, GA 30328

Kimberly Caswell
GTE Florida Incorporated
P. O. Box 110, FLTC0007
Tampa, FL 33601-0110

Norman H. Horton, Jr.
Messer, Caparello & Self
215 S. Monroe St., Suite 701
Tallahassee, FL 32301

Richard Melson
Hopping Law Firm
P. O. Box 6526
Tallahassee, FL 32314

Scott Sappersteinn
Intermedia Communications, Inc.
3625 Queen Palm Drive
Tampa, FL 33619-1309

Mark Buechele
P. O. Box 398555
Miami Beach, FL 33239-8555

Karen Camechis
Pennington, Moore, et al.
215 S. Monroe Street
Tallahassee, FL 32301

Donna C. McNulty
MCI WorldCom
325 John Knox Road, Suite 105
Tallahassee, FL 32303-4131

Stephen C. Reilly
Office of Public Counsel
c/o The Florida Legislature
111 W. Madison St., Room 812
Tallahassee, FL 32399-1400

J. Jeffry Wahlen
Ausley & McMullen
P. O. Box 391
Tallahassee, FL 32302

Rodney L. Joyce
Shook, Hardy & Bacon
600 14th St., N.W., Suite 800
Washington, DC 20005-2004

Jon Moyle
Moyle Law Firm
The Perkins House
118 N. Gadsden Street
Tallahassee, FL 32301

Jonathan Canis
Kelley law Firm
1200 19th St., N.W., 5th Floor
Washington, DC 20036

Attorney

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

ADDITIONAL SUPPLEMENTAL DIRECT TESTIMONY

OF

Kent W. Dickerson

Q. Please state your name and business address.

A. My name is Kent W. Dickerson. My business address is 6360 Sprint Parkway, Overland Park, KS 66251. I am employed as Director - Cost Support for Sprint/United Management Company.

Q. Are you the same Kent W. Dickerson that presented prior direct testimony in this case?

A. Yes, I am.

Q. What is the purpose of your additional supplemental testimony?

A. The purpose of my additional supplemental testimony is to introduce and support Exhibit KWD-5, which pertains to cost study changes associated with High Capacity loops.

Q. What changes have been made to the high capacity loop costs provided in Sprint's previous filing?

A. Minimal changes have been made to Sprint's investment calculations for DS3 level loops; however, several changes have been made to the DS3 unit cost calculation which results in lower costs. The following details the changes made from Sprint's previous filing:

- Removed inadvertent double application of common cost factor.
- Modified cost summary schedule to reflect monthly rates.
- Simplified terminal cost calculations were used which reflect a standard DS3 terminal cost. A composite DS3 cost was derived using costs for OC3, OC12, and OC48 configurations. The frequency of occurrence and utilization for each configuration were used in developing a standard cost.
- Added a spare card to the OC12 and OC48 terminal configurations, and removed an unnecessary OC48 common card.
- Established a per DS3 cost for fiber that reflects sharing of DS3s for each terminal configuration. The cost for fiber was calculated using actual high

capacity loop customer locations and calculating the costs to serve each location as discussed in the Direct Testimony of Jim Dunbar. The results were sorted by terminal size, summed, and a composite fiber cost per DS3 developed using a methodology similar to the DS3 terminal cost calculations described above. This would only apply to DS3 circuit purchases, not to terminal capacities of OC3 and higher which require dedicated fiber.

- Costs for High Capacity circuits OC3 and above were added, and reflect a cost for one end of the circuit. Note: Costs for both ends will simply be twice the single-ended rate. Facility costs using the Dark Fiber UNE rates must be added to these costs.

KWD-5 also includes a fiber cost allocation for DS3 level high capacity circuits to simplify the cost summary schedule, and to ensure that DS3 costs reflect appropriate levels of fiber sharing when single circuits are purchased. Sprint's previous methodology resulted in unique costs for each additional DS3, which would have resulted in an unworkable billing and tracking arrangement. The revised methodology provides more reasonable and consistent cost results.

KWD-5 includes cost study development and associated documentation for all high capacity loops; it replaces all documentation associated with High Capacity loops from Sprint's May 1st filing.

Q. What new additional high capacity loop costs is Sprint proposing?

A. In addition to the DS3 circuit cost changes described previously, my supplemental testimony also proposes new high capacity loop cost options for OC3 and higher level optical interfaces that were previously not considered. A complete revised list of UNE Pricing including these new items will be provided in the supplemental testimony of Sprint's witness, Mr. James W. Sichter. The unique card and optical termination configurations required for OC3, OC12, and OC48 high capacity loops are shown in the worksheets of exhibit KWD-5. At a minimum, CLECs must purchase one terminal end of each high capacity circuit with a bandwidth of OC3 and higher. Terminal sizing will be based on total circuit requirements. Since these are optical level interfaces, CLECs will be required to purchase

dark fiber in addition to the terminal as shown in Sprint's pricing schedule.

Q. **Are there constraints that would apply to CLECs who wish to provision one end of a high capacity circuit using their own equipment?**

A. Yes. To ensure proper operation of the total circuit, CLECs who elect to provision one end of the circuit using their own terminal must purchase Sprint-approved equipment that is compatible with the corresponding Sprint-provided terminal. Sprint will coordinate with CLECs who choose this option to ensure compatibility.

Q. Does this conclude your supplemental testimony?

A. Yes.

HIGH CAPACITY LOOPS
COST STUDY – METHODS

Sprint Florida, Inc.

Docket No. 990649-TP

July 10, 2000

HIGH CAPACITY LOOPS
COST STUDY - METHODS

Table of Contents

A. PURPOSE

Determine the cost of providing high capacity loops. Per Order PSC-00-0540-PCO-TP, high capacity loops are defined as DS3 and above. High capacity loops require fiber optic transport and transmission facilities. Sprint's study identifies the necessary network facilities and costs to provide transport and termination of dedicated high capacity loops.

B. SCOPE

This study determines the costs of provisioning high capacity loops. The following options are provided for purchase: DS3, OC3 termination with DS3 bandwidth, OC12 termination with DS3 and/or OC3 bandwidth, and OC48 termination with DS3, OC3, and/or OC12 bandwidth. Costs were calculated on a per termination basis for terminations at the OC3 level and greater. This allows greater flexibility for customers to select various bandwidths and terminal configurations.

C. ASSUMPTIONS

1. Use of Fiber Optic facilities is assumed for provisioning High Capacity loops. Based on forward-looking plant design, this consists primarily of shared Fiber Optic feeder facilities; fiber distribution facilities are also required to terminate to each end user location. Use of forward-looking SONET technology and least cost network unit costs are assumed.

2. Current DS3 customer locations in Sprint's local network are used as the basis of deriving unit costs and associated terminal characteristics.

3. Forward-looking network design incorporates the use of common fiber routes serving Digital Loop Carrier Systems (DLCs) and other customers, as applicable, to create the most efficient network design model.

D. METHODOLOGY

A Total Element Long Run Incremental Cost (TELRIC) study methodology was used to identify the cost of High Capacity Loops. The cost of a High Capacity Loop consists of the circuit terminal costs and fiber costs. The unit costs for DS3 level High Capacity Loops are calculated on a flat rate basis that encompasses circuit and fiber costs.

Circuits at the OC3 level and higher are calculated on a per termination basis with separate components associated with circuit and fiber costs. This allows the option for the CLECs to provide their own terminal at one end of the circuit. Dark fiber prices would apply since the OC3 level circuits and above are direct optical interfaces that require dedicated fiber.

DS3 Bandwidth:

The per DS3 High Capacity Loop will be provisioned by Sprint on available terminals that vary in size. The final cost was determined by combining the terminal cost, card cost, and fiber cost:

Terminal Costs:

In order to distribute common costs and ensure cost recovery, Sprint determined appropriate levels of demand by obtaining state-specific data from its Carrier Access Information System (CAIMS) and Customer Record Billing (CRB) systems. The information from these systems allowed identification of Wire Center, service address and circuit quantity information for high capacity loops. This information was geocoded and entered into the Sprint Loop Cost Model (SLCM), which constructs the forward-looking plant design required to support high capacity loop demand.

The SLCM results include Wire Center-specific investment based on actual demand to each grid location within a Wire Center. The SLCM demand information, audited to ensure separate customer locations are properly identified for terminal count purposes, was used to determine terminal fill factors for high capacity loop demand. A level of demand was determined by terminal size.

The most current vendor pricing available was then used to determine the common material and labor cost of OC-3, OC-12, and OC-48 terminal sizes. The common material and labor cost of each terminal size is then distributed over the average fill for the terminal.

Using the same data used to determine the average fill, the cost of the three terminal sizes were weighted by the number of each size terminal. The weighted terminal cost is used as the terminal cost element of the DS3 High Capacity Loop.

Card Costs:

The cost of the DS3 card appropriate for each terminal size is broken down to a per DS3 cost. The OC3 terminal uses a single DS3 card. However, the OC12 and higher terminals use a Quad DS3 card designed to provision four DS3s.

The per DS3 card cost for each terminal is weighted by the number of each terminal size just as the terminal costs were weighted. The weighted DS3 card cost is the card cost element of the DS3 High Capacity Loop.

Fiber Costs:

The SLCM results include fiber investment for actual DS3 demand to each grid location within a Wire Center. (Refer to Worksheet 5.) Terminal sizes were assigned to each grid location based on the actual DS3 demand. The total fiber investment for all grid locations with the same terminal size was divided by the actual DS3 demand for the same grid locations (i.e., the total fiber investment for all grid locations requiring an OC3 terminal is divided by the DS3 demand for the same grid locations.) The average fiber investment per DS3 for each terminal size was weighted by the number of each terminal size, just as the terminal cost and card cost have been weighted Appropriate annual charge factors and common cost factors are then applied. (Refer to Worksheet 6.) . The weighted fiber cost is the fiber cost element per DS3 High Capacity Loop.

OC3, OC12, OC48 Termination:

High Capacity Loop costs for OC3, OC12, and OC48 terminations reflect a fiber optic terminal cost and card cost (based on total bandwidth required.) They are presented separately to allow flexibility in choosing bandwidths. The termination cost is the entire cost of an OC3, OC12, and unidirectional OC48 terminal appropriately configured to provide High Capacity Loops. At a minimum, one termination charge will apply for the central office termination. Customers have the option to acquire a termination at the customer premises from Sprint, or supply a compatible interface using Sprint-approved equipment types. If the customer chooses to acquire a customer premises termination from Sprint, the termination cost would apply twice: the central office termination and the customer premises termination.

Depending on the terminal size, various bandwidths can be provided: OC3 terminals can provide DS3 bandwidth; OC12 terminals can provide DS3 bandwidth (in groups of four DS3s) and OC3 bandwidth; and, OC48 terminals can provide DS3 bandwidth (in groups of four DS3s), OC3 bandwidth, and OC12 bandwidth. Cards costs are for the entire card (single DS3 for the OC3 termination and a Quad DS3 for an OC12 or OC48 termination.) The resulting card cost would apply twice if the customer chooses to purchase both the central office and the far end terminations from Sprint.

The fiber cost is not included in the terminal or card costs. It is applied separately at a price that matches the geographic location of the order. Refer to the Dark Fiber cost study for the fiber cost element of OC3, OC12, and OC48 High Capacity Loops.

The combination of the termination cost, the card cost and the fiber cost is the total cost for an OC3, OC12, or OC48 High Capacity Loop.

High Capacity Loops
Unit Cost Results

Source				Capacity
	DS3 Bandwidth			
Worksheet 1	Per DS3, both ends	$	**1,352.93**	Dual Termination of one DS3, includes allocation of fiber cable cost
	OC3 Termination			
Worksheet 2	Single Termination per OC3	$	**847.60**	Single termination
	DS3 Card			
Worksheet 2	Single Termination per DS3 Card	$	**64.46**	One DS3, single termination purchased with OC3 term
				Does not include fiber cost. Refer to Dark Fiber Study for additional fiber costs.
	OC12 Termination			
Worksheet 3	Single Termination per OC12	$	**914.06**	Single Termination
	DS3 Card			
Worksheet 3	Single Term - Quad DS3 Card *	$	**149.39**	Four DS3s, single termination purchased with OC12 term
	OC3 Card			
Worksheet 3	Single Termination per OC3 Card	$	**93.30**	One OC3, single termination purchased with OC12 term
				Does not include fiber cost. Refer to Dark Fiber Study for additional fiber costs.
	OC48 Termination			
Worksheet 4	Single Termination per OC48	$	**1,480.95**	Single Termination
	DS3 Card			
Worksheet 4	Single Term - Quad DS3 Card *	$	**149.39**	Four DS3s, single termination purchased with OC48 term
	OC3 Card			
Worksheet 4	Single Termination per OC3 Card	$	**93.30**	One OC3, single termination purchased with OC48 term
	OC12 Card			
Worksheet 4	Per OC12 Card	$	**142.05**	One OC12, single termination purchased with OC48 term
				Does not include fiber cost. Refer to Dark Fiber Study for additional fiber costs.

* OC12 and OC48 Terminals use Quad DS3 interfaces.
Single DS3 Interfaces are unavailable.

** OC3, OC12, and OC48 Terminal services will be provided with or without Sprint provided terminal equipment at the customer premise. In all cases Sprint will provide at least one terminal at the serving central office. When CLECs elect to furnish their own terminal equipment, they must work cooperatively with Sprint to provide a compatible physical interface, and must use Sprint approved equipment types.

High Capacity Loops
Worksheet 1
DS3 Cost Calculation - Two Terminations
Florida

Terminal Cost

	A	B Worksheet 5	C B / B4	D Worksheet 6	E Worksheet 5	F D/E	G C*F	
	Terminal Size	**# of Terminals**	**% of Total**	**Terminal Costs**	**Average % Fill**	**Terminal Costs per DS3**	**Weighted Terminal Costs per DS3**	
1	OC3	[redacted]	64.58%	10,171.25	1.20	8,476.04	5,474.11	
2	OC12		22.92%	10,968.78	4.80	2,285.16	523.68	
3	OC48 Uni		12.50%	17,771.45	26.80	663.11	82.89	
4	Total		100.00%				$ 6,080.68	Annual - Single Termination
							$ 506.72	Monthly - Single Termination
							$ 1,013.45	Monthly - Dual Termination

DS3 Card

	A	B Worksheet 5	C B / B8	D	E Worksheet 6	F E/D	G C*F	
	Terminal Size	**# of Terminals**	**% of Total**	**# DS3s per Card**	**Card Costs**	**Cost per DS3**	**Weighted Card Cost per DS3**	
5	OC3	[redacted]	64.58%	1	773.55	773.55	499.59	
6	OC12		22.92%	4	1,792.65	448.16	102.70	
7	OC48 Uni		12.50%	4	1,792.65	448.16	56.02	
8			100.00%		4,358.85		$ 658.31	Annual - Single Termination
							$ 54.86	Monthly - Single Termination
							$ 109.72	Monthly - Dual Termination

Fiber

	A	B Worksheet 6	
		Average Fiber Costs	
5	Per DS3	2,757.20	Annual
6		**$ 229.77**	Monthly

Monthly DS3 $ 1,352.93

High Capacity Loops
Worksheet 2

OC3 Terminal
Florida

Terminal Cost

	A	B	
	Terminal Size	**Terminal Costs**	
1	OC3	10,171.25	from Worksheet 6
2			
3			
4		$ 10,171.25	Annual - Single Termination
		$ 847.60	Monthly - Single Termination

DS3 Card

	A	B	
	Terminal Size	**Card Costs**	
5	OC3	773.55	from Worksheet 6
6			
7			
8		$ 773.55	Annual - Single Termination
		$ 64.46	Monthly - Single Termination

High Capacity Loops
Worksheet 3

OC12 Terminal
Florida

Terminal Cost

	A	B	
	Terminal Size	Terminal Costs	
1	OC12	10,968.78	from Worksheet 6
2			
3			
4		$10,968.78	Annual - Single Termination
		$ **914.06**	Monthly - Single Termination

Quad DS3 Card

	A	B	
	Terminal Size	Card Costs	
5	OC12	1,792.65	from Worksheet 6
6			
7			
8		$ 1,792.65	Annual - Single Termination
		$ **149.39**	Monthly - Single Termination

OC3 Card

	A	B	
	Terminal Size	Card Costs	
5	OC12	1,119.64	from Worksheet 6
6			
7			
8		$ 1,119.64	Annual - Single Termination
		$ **93.30**	Monthly - Single Termination

High Capacity Loops
Worksheet 4

OC48 Terminal
Florida

Terminal Cost

	A	B	
	Terminal Size	**Terminal Costs**	
1	OC48	17,771.45	from Worksheet 6
2			
3			
4		$ 17,771.45	Annual - Single Termination
		$ 1,480.95	Monthly - Single Termination

Quad DS3 Card

	A	B	
	Terminal Size	**Card Costs**	
5	OC48	1,792.65	from Worksheet 6
6			
7			
8		$ 1,792.65	Annual - Single Termination
		$ 149.39	Monthly - Single Termination

OC3 Card

	A	B	
	Terminal Size	**Card Costs**	
5	OC48	1,119.64	from Worksheet 6
6			
7			
8		$ 1,119.64	Annual - Single Termination
		$ 93.30	Monthly - Single Termination

OC12 Card

	A	B	
	Terminal Size	**Card Costs**	
5	OC48	1,704.62	from Worksheet 6
6			
7			
8		$ 1,704.62	Annual - Single Termination
		$ 142.05	Monthly - Single Termination

High Capacity Loops
Worksheet 5
Special DS3 Data
Florida

A	B	C	D	E	F	G	F + G H		I	Count of Col D by Term Type J	Avg # DS3s Term Size K	Fib Cost per Term, Col H L	Total DS3s by Term Type, Col C M	L / M N	Col J / Tot Col J O	N X O P
SWCLLI	FDICODE	DS3 Quantity	Terminal Size		Total Fiber Feeder Allocated DS3 - Per Location	Distribution Fiber Allocated DS3 - Per Location	Total Fiber		Terminal Size	Number of Terminals	Average Fill	Total Fiber Cost per Term Type	# of DS3s	Avg Fiber Cost per DS3	% of Total Terminals	Wtd. Fiber
[redacted]									OC3	[redacted]	1.2	[redacted]			64.58%	9,424.10
									OC12		4.8				22.92%	1,039.62
									OC48 Uni		26.8				12.50%	98.22
									Total							10,561.94

004293

High Capacity Loops
Worksheet 6
ACFs, Common

		Source	OC 3 Common Terminal	OC 3 DS3 Card	OC 12 Common Terminal	OC 12 DS3 Card	OC 12 OC3 Card	OC 48 Two Fiber Unidirectional Common Terminal	OC 48 DS3 Card	OC 48 OC3 Card	OC 48 OC12 Card
1	**Investment - Loop Circuit Equipment**	Worksheets 7, 8, 9, 10	$ 30,002	$ 2,282	$ 32,354	$ 5,288	$ 3,303	$ 52,420	$ 5,288	$ 3,303	$ 5,028
2	Annual Charge Factor - Loop Circuit Equipment	ACF Tab Volume 1	27.24%	27.24%	27.24%	27.24%	27.24%	27.24%	27.24%	27.24%	27.24%
3	Annual Cost - Loop Circuit Equipment	L1 X L2	$8,172.52	$621.54	$8,813.33	$1,440.38	$899.62	$14,279.23	$1,440.38	$899.62	$1,369.65
4	Other Direct Expense Factor	ODC Tab Volume 1	2.24%	2.24%	2.24%	2.24%	2.24%	2.24%	2.24%	2.24%	2.24%
5	Other Direct Expense	L1 X L4	$ 672.04	$ 51.11	$ 724.74	$ 118.45	$ 73.98	$ 1,174.21	$ 118.45	$ 73.98	$ 112.63
6	**Annual Cost with ODE- Loop Circuit Equipment**	L3 + L5	$ 8,844.57	$ 672.65	$ 9,538.07	$ 1,558.83	$ 973.60	$ 15,453.44	$ 1,558.83	$ 973.60	$ 1,482.28
7	Common Cost Factor	ODC Tab Volume 1	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
8	Common Cost	L7 X L6	$ 1,326.68	$ 100.90	$ 1,430.71	$ 233.82	$ 146.04	$ 2,318.02	$ 233.82	$ 146.04	$ 222.34
9	**Total Annual Cost - Loop Circuit Equipment**	**L6 + L8**	**$ 10,171.25**	**$ 773.55**	**$ 10,968.78**	**$ 1,792.65**	**$ 1,119.64**	**$ 17,771.45**	**$ 1,792.65**	**$ 1,119.64**	**$ 1,704.62**

		Source	Fiber per DS3 Terminal
1	**Investment - Fiber**	Worksheet 5	$ 10,562
2	Annual Charge Factor - Loop Dark Fiber	Dark Fiber Study	22.70%
3	**Annual Cost - fiber**	L1 X L2	$2,397.56
4	Common Cost Factor	ODC Tab	15.00%
5	Common Cost	L3 X L4	$ 359.63
6	**Total Annual Cost - Fiber**	**L3 + L5**	**$ 2,757.20**

See dark fiber section for loop cost for OC3, O12 and OC48

High Capacity Loops
Worksheet 7

Alcatel OC-3 Central Office Terminal (7'-0")
DS3 Card

Matcode	Configuration P/N	Configuration Description	Qty	Unit Price	Unit Extension	Material Price	
030464	1603 SMX-COT-01	7 FT frame assembly w/1-RS PDU w frame bus kit					
		(1) 625002-000-008 Fan Panel with Filter					
		(1) 3EM02211AA SLM201 SMX Shelf					
030469	1603 SMX-COM-0	SMX COM-01 includes:					
	600308-393-001	PWR A01 Power Converter	3				
	3AL00124AB	CLK 202 Clock Unit	2				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	1				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	2				
020733	3AL00378AB	NEP 402 Network Processor w/ LAN	1				
	3AL00308AA	HIFB01 High Speed OC3 IR 1310nm FC/PC	2				
012270	3EM02991AAAA	HD Coax/Baffle/Fiber Panel	1				
030479	3AL02830ABAC	ADR48 R1.01 Ring Network Software CD ROM	1				
		Total 1603					
030480	1603 SMX-SPR-01	**Spares include the following:**					
	600308-393-001	PWR A01 Power Converter	0.25				
	3AL00124AB	CLK 202 Clock Unit	0.25				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	0.25				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	0.25				
005803	3AL00114AB	625611-000-002 DS1 Floating Drop Interface DMI102	0.25				
005802	625611-000-002	3AL00114AB Virtual Group Interface VTG102(4DS-1's/card)	0.25				
421872	3AL00328AA	LIF701 DS3 Interface	0.25				
012288	3AL00290AA	LDR 101 Line Driver/Receiver	0.25				
	3AL00308AA	HIFB01 High Speed OC3 IR 1310nm FC/PC	0.25				
		Total Spares					
		DS3 Card Requirements (Necessary to install any and all DS3 Cards)					
	3EM02075AA	CIOP 401 DS3/STS1 Input/Output Panel	1				
	601303-540-042	Coax Ribbon Cable Assy w/ 8 BNC, 42"	1				
		Total DS3 Card Requirments					
9		**Fiber Patch Panel (per fiber)**	4				from Worksheet 10
		Fiber Patch Cord (per fiber)	4				from Worksheet 10
		Total Cost of Patch Panels and Cords					
		Common Material Costs					
		Sales Tax				6.59%	from Worksheet 11
		Total Common Material Costs				$ 23,979.66	
		ENGINEERING HOURS					
		OC3 Terminal			41.30		
		Patch Panels (per fiber)	4.0	0.11	0.44		from Worksheet 10
		Patch Cords (per fiber)	4.0	0.02	0.08		from Worksheet 10
		Total Engineering Hours per Terminal			41.82		
		Cost of Engineering Labor for Terminal	41.82	43.09	1,802.22		
		INSTALLATION HOURS					
		OC3 Terminal			96.70		
		Patch Panels (per fiber)	4.0	0.22	0.89		from Worksheet 10
		Patch Cords (per fiber)	4.0	0.03	0.12		from Worksheet 10
		Total Installation Hours per Terminal			97.71		
		Cost of Installation Labor for Terminal	97.71	43.19	4,220.05		
		Total Cost of OC3 Terminal Engineering and Installation Labor				6,022.26	
		Material and Labor				**30,001.92**	
		DS3/STS1 Interface Card					
421872	3AL00328AA	LIF701 DS3 Interface*	2				
012288	3AL00290AA	LDR 101 Line Driver/Receiver **	2				
		DS3 Interface Card Costs					
		Sales Tax				6.59%	from Worksheet 11
		CARD COST				**$ 2,281.73**	

* The interface provides 1 DS3. Two cards are needed per DS3: one working and one standby.

** Two line driver / receivers are needed per working DS3.

High Capacity Loops
Worksheet 8

Alcatel OC-12 Central Office Terminal (7'-0")

Matcode	Configuration P/N.	Configuration Description	Qty	Unit Price	Unit Extension	Material Price	
030464	1603 SMX-COT-01	7 FT frame assembly w/1-RS PDU w frame bus kit (1) 625002-000-008 Fan Panel with Filter (1) 3EM02211AA SLM201 SMX Shelf					
030469	1603 SMX-COM-01	SMX COM-01 includes:					
	600308-393-001	PWR A01 Power Converter	3				
	3AL00124AB	CLK 202 Clock Unit	2				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	1				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	2				
020731	3AL00378AA	NEP 401 Network Processor w/ LAN	1				
020653	3AL00238AC	HIF 603 High Speed OC12 IR 1310nm FC/PC	2				
012270	3EM02991AAAA	HD Coax/Baffle/Fiber Panel	1				
030479	3AL02830ABAC	ADR48 R1.01 Ring Network Software CD ROM	1				
	601303-540-042	Coax Ribbon Cable Assy w/ 8 BNC, 42"	1				
		Total 1603					
030480	1603 SMX-SPR-01	**Spares include the following:**					
	600308-393-001	PWR A01 Power Converter	0.25				
	3AL00124AB	CLK 202 Clock Unit	0.25				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	0.25				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	0.25				
005803	3AL00114AB	625611-000-002 DS1 Floating Drop Interface DMI102	0.25				
005802	625611-000-002	3AL00114AB Virtual Group Interface VTG102(4DS-1's/card)	0.25				
012287	3AL00224AC	LIF502 QUAD DS3/STS1 Interface	0.25				
012288	3AL00290AA	LDR 101 Line Driver /Receiver	0.25				
	3AL00256AD	OC3 interface LIF404	0.25				
020653	3AL00238AC	HIF 603 High Speed OC12 IR 1310nm FC/PC	0.25				
		Total Spares					
		DS3 Card Requirements (Necessary to install any and all DS3 Cards)					
	3EM02075AA	CIOP 401 DS3/STS1 Input/Output Panel	1				
		Total DS3 Card Requirments					
		Fiber Patch Panel (per fiber)	4				from Worksheet 11
		Fiber Patch Cord (per fiber)	4				from Worksheet 11
		Total Cost of Patch Panels and Cords					
		Common Material Costs					
		Sales Tax				6.59%	from Worksheet 11
		Total Common Material Costs				$ 26,332.10	
		ENGINEERING HOURS					
		OC12 Terminal			41.30		
		Patch Panels (per fiber)	4.0	0.11	0.44		from Worksheet 10
		Patch Cords (per fiber)	4.0	0.02	0.08		from Worksheet 10
		Total Engineering Hours per Terminal			41.82		
		Cost of Engineering Labor for Terminal	41.82	43.09	1,802.22		
		INSTALLATION HOURS					
		OC12 Terminal			96.70		
		Patch Panels (per fiber)	4.0	0.22	0.89		from Worksheet 10
		Patch Cords (per fiber)	4.0	0.03	0.12		from Worksheet 10
		Total Installation Hours per Terminal			97.71		
		Cost of Installation Labor for Terminal	97.71	43.19	4,220.05		
		Total Cost of OC12 Terminal Engineering and Installation Labor				6,022.26	
		Material and Labor				**32,354.36**	
		DS3/STS1 Quad Interface Cards					
012287	3AL00224AC	LIF502 QUAD DS3/STS1 Interface*	2				
012288	3AL00290AA	LDR 101 Line Driver /Receiver**	8				
		Cost for DS3 Quad Interface Card					
		Sales Tax				6.59%	from Worksheet 11
		CARD COST				$ 5,287.74	
		OC3 Card					
	3AL00256AD	OC3 interface LIF404	2				
		Fiber Patch Panel (per fiber)	2				from Worksheet 11
		Fiber Patch Cord (per fiber)	2				from Worksheet 11
		Cost for OC3 Interface Card					
		Sales Tax				6.59%	from Worksheet 11
		CARD COST				$ 3,302.58	

* 1 to 4 DS3s require two line interfaces: one working, one back-up.

** 2 line drivers / receivers per DS3 Quad Card.

High Capacity Loops
Worksheet 9

Alcatel OC-48 Central Office Terminal (7'-0")

Matcode	Configuration P/N.	Configuration Description	Qty	Unit Price	Unit Extension	Material Price	
030464	1603 SMX-COT-01	7 FT frame assembly w/1-RS PDU w frame bus kit (1) 625002-000-008 Fan Panel with Filter (1) 3EM02211AA SLM201 SMX Shelf					
030469	1603 SMX-COM-01	SMX COM-01 includes:					
	600308-393-001	PWR A01 Power Converter	3				
	3AL00124AB	CLK 202 Clock Unit	2				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	1				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	2				
030471	3AL00378AF	NEP 603 Network Processor w/o LAN	1				
030476	3AL00338AA	HIF F01 High Speed OC48 IR 1310 nm FC/PC	2				
012270	3EM02991AAAA	HD Coax/Baffle/Fiber Panel	1				
030479	3AL02830ABAC	ADR48 R1.01 Ring Network Software CD ROM	1				
016155	3EM02079AA	LIF D01 12xDS3/STS1 Low Speed Interface	4				
	3EM02065AA	LDR 501 Dual DS-3/STS1 Line Driver	12				
	3EM02075AA	CIOP 401 DS3/STS1 Input/Output Panel	1				
		Total 1603					
030480	1603 SMX-SPR-01	**Spares include the following:**					
	600308-393-001	PWR A01 Power Converter	0.25				
	3AL00124AB	CLK 202 Clock Unit	0.25				
	3AL00380AG	COA 607 Craft, OW & Alm w/ dual exp mem	0.25				
	3AL00424AA	CCM 101 Software Programmable OC48 Xconn	0.25				
012287	3AL00224AC	LIF502 QUAD DS3/STS1 Interface	0.25				
012288	3AL00290AA	LDR 101 Line Driver /Receiver	0.25				
	3AL00256AD	OC3 interface LIF404	0.25				
	3AL00428AA	OC12 interface LIF801	0.25				
030476	3AL00338AA	HIF F01 High Speed OC48 IR 1310 nm FC/PC	0.25				
		Total Spares					
		DS3 Card Requirements (Necessary to install any and all DS3 Cards)					
	3EM02075AA	CIOP 401 DS3/STS1 Input/Output Panel	1				
		Total DS3 Card Requirements					
		Fiber Patch Panel (per fiber)	4				from Worksheet 10
		Fiber Patch Cord (per fiber)	4				from Worksheet 10
		Total Cost of Patch Panels and Cords					
		Common Material Costs					
		Sales Tax				6.59%	from Worksheet 11
		Total Common Material Costs				$ 46,397.81	
		ENGINEERING HOURS					
		OC48 A 2 Fiber Unidirectional Terminal			41.30		
		Patch Panels (per fiber)	4.0	0.11	0.44		
		Patch Cords (per fiber)	4.0	0.02	0.08		
		Total Engineering Hours per Terminal			41.82		
		Cost of Engineering Labor for Terminal	41.82	43.09	1,802.22		
		INSTALLATION HOURS					
		OC48 A 2 Fiber Unidirectional Terminal			96.70		
		Patch Panels (per fiber)	4.0	0.22	0.89		from Worksheet 10
		Patch Cords (per fiber)	4.0	0.03	0.12		from Worksheet 10
		Total Installation Hours per Terminal			97.71		
		Cost of Installation Labor for Terminal	97.71	43.19	4,220.05		
		Total Cost of OC12 Terminal Engineering and Installation Labor				6,022.26	
		Material and Labor				**52,420.07**	
		DS3/STS1 Quad Interface Cards					
012287	3AL00224AC	LIF502 QUAD DS3/STS1 Interface*	2				
012288	3AL00290AA	LDR 101 Line Driver /Receiver**	8				
		Cost for DS3 Quad Interface Card					
		Sales Tax				6.59%	from Worksheet 11
		CARD COST				$ 5,287.74	
		OC3 Card					
	3AL00256AD	OC3 interface LIF404	2				
		Fiber Patch Panel (per fiber)	2				from Worksheet 10
		Fiber Patch Cord (per fiber)	2				from Worksheet 10
		Cost for OC3 Interface Card					
		Sales Tax				6.59%	from Worksheet 11
		OC3 CARD COST				$ 3,302.58	
		OC12 Card					
	3AL00428AA	OC12 interface LIF801	2				
		Fiber Patch Panel (per fiber)	2				from Worksheet 10
		Fiber Patch Cord (per fiber)	2				from Worksheet 10
		Cost for OC12 Interface Card					
		Sales Tax				6.59%	from Worksheet 11
		OC12 CARD COST				$ 5,028.07	

* 1 to 4 DS3s require two line interfaces: one working, one back-up.

** 2 line drivers / receivers per DS3 Quad Card.

High Capacity Loops
Worksheet 10

Seicor Fiber Patch Panel

Item	Configuration P/N.	Configuration Description	Qty	Unit Price	Material Price
968311	ACH-72-11	72 Fiber Angled Panel Housing equipped with: 72 FC Sleeves intalled	1		
		TOTAL MATERIAL			
		70% Utilization			
		Material per fiber			
		ENGINEERING HOURS	**8**		
		per fiber	**0.11**		
		INSTALLATION HOURS	**16**		
		per fiber	**0.22**		

Seicor Fiber Patch Cord

Mat Code	Configuration P/N.	Configuration Description	Qty	Unit Price	Material Price
964081	545401R3131050M	Ultra FCPC-to-FCPC 50 Meter	1		
		TOTAL MATERIAL			
		ENGINEERING HOURS	**0.02**		
		INSTALLATION HOURS	**0.03**		

Note: Fiber tip cables can be ordered in a variety of lengths.
This jumper represents the median cost of the family of cables.

High Capacity Loops
Worksheet 11
Input Labor Rates and Sales Tax

Engineering Labor Rate:	**$43.09**
Installation Labor Rate:	**$43.19**
Sales Tax:	**6.59%**