



SBC-002-316-072

BPON FTTH Common Systems Provisioning using Angled Fiber Optic Connectors, SBC-West (California) only

This NOTICE is issued to cover the deployment of Broadband Passive Optical Network (BPON) for the Fiber-To-The-Home (FTTH) in SBC-West (California) only.

TO: Network Planning and Engineering (Transport Equipment Engineer (TEE), Facility Equipment Engineer (FEE), Digital Transport Engineer (DTE), Maintenance Engineer, Frame Planner, Long Range Technical Planners), Circuit Provisioning, Outside Plant Engineering, Network Operations (LFO), Outside Plant Engineering, Special Services and Fundamental Network Planning. . This document is to be used internally within **SBC-13STATE** and their Authorized Vendors and has a limited distribution subject to the header/footer information.

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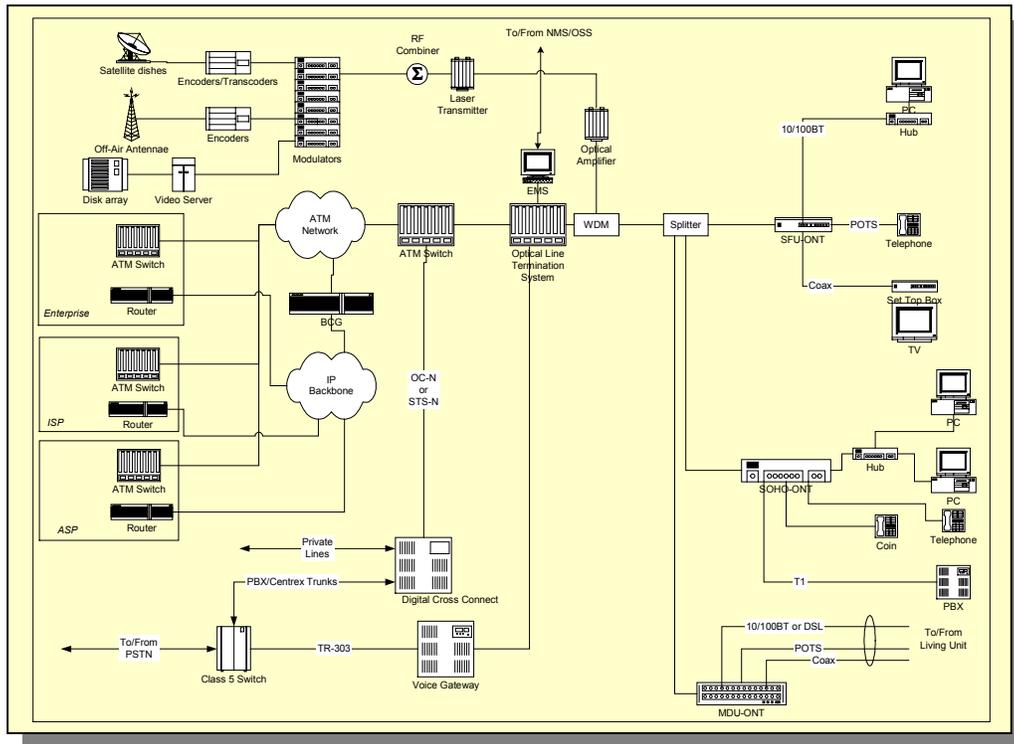
1. Reasons for Revision

This section is reserved for future updates.

2. Introduction

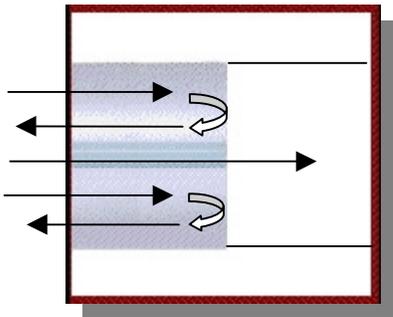
2A. Overview

This document will cover the needs of the Broadband Passive Optical Network (BPON) systems to offer the promise of nearly unlimited bandwidth potential by providing fiber all the way to the home (FTTH). The BPON systems has deployed follow the ITU-T G.983 series of standards using a high power Analog Video optical signal, which define the optical network requirements, the framing formats, protocols and an embedded operations channel. As a result of the first company application of FTTH for BPON in SBC-West (Mission Bay Area) and the resulting test results having been analyzed, it has been determined that modifications to connectors need to be made for this service throughout the network. This technology integrates Voice, Data and Video services. An illustration of BPON is shown below:



2B. Analog Video Needs

One of the components of the optical signal will be the Analog Video. It has rigorous specifications for Carrier-to-Noise Ratio (CNR) and Signal-to-Noise Ratio (SNR) and as a result is susceptible to optical crosstalk in the BPON system and to the optical power budget. In order to compensate for this situation, the optical signal for the combined BPON FTTH needs to have a high optical output signal that can be subject to reflection issues with standard Ultra-Polished Connectors (UPC). See the illustration below:



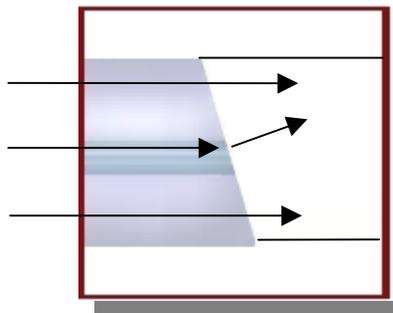
Flat Polish Connector

Light is reflected straight back
down the originating core

Return Loss = -55dB

Adequate for most applications

The recommendation from Technology Resources Incorporated (SBC-TRI) requires consideration to use an angled connector instead of the standard vertical connector in order to mitigate optical reflection issues when high power is placed on the circuit feeds. **As a result of a thorough evaluation by TRI and with consultation and approval of SBC Services Inc. NP&E, the use of SC-APC (Angled Polished Connectors) will need to be used on all optical paths for BPON FTTH in SBC-West (California); this document is not applicable to the other regions and states within SBC Communications Inc.** This will include both the subscriber supporting Central Office and all cross-connects and intermediate Central Offices between the Head End transmitter of the Analog Optical Signal to the subscriber supporting Central Office. As can be seen by the illustration below, the use of the APC connector will reduce the reflection of the optical signal back to the originating end and maximize the through-put of the signal to the customer.



Angled Polish Connector

Light is reflected into the cladding

Return Loss = -60dB

Ideal for CATV applications

3. Operational & Engineering Considerations

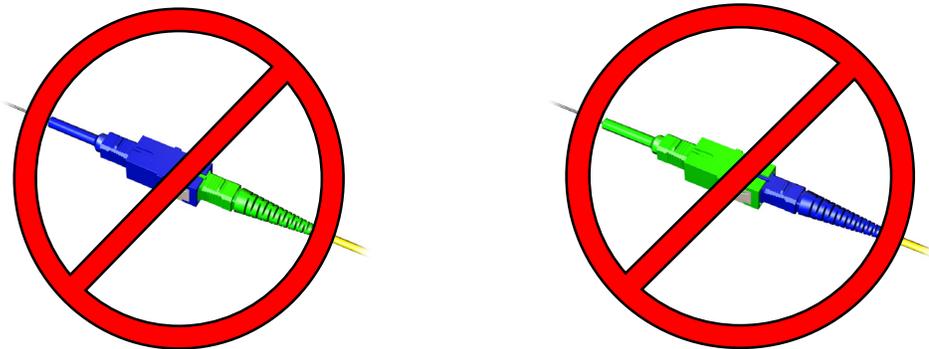
All connectors on both sides of each OSP and FOT panels with any Fiber Distribution Frame must be converted at the same time to the SC-APC SingleMode angled connectors, both on the front and the rear of each panel. Any subtending fiber panels and other Central Offices that the circuit traverses will also need to be changed. The **Fundamental Planner or Interoffice Facility (IOF) Planning Engineer** responsible for the BPON deployment in their respective region area will evaluate the specific locations and panels/connectors that need to be changed. A Serving Plan will be developed by this planner and distributed to the **Equipment Engineer** for work activity to commence. This group will contact the Equipment Engineer to convert only the terminations required for this service to be implemented. The Equipment Engineer will be responsible for the issuance of the Telephone Equipment Order (TEO) for any changes to the SC-APC Connectors within the Central Office structures. The TEO will include the following items for cost and time charging:

- Changing of existing connectors in all panels.
- Changing of connectors with stubs/tails terminated in the back of OSP panels.
- Purchase of cross-connect jumpers for the initial service request.
- Purchase of all cabling and jumpers between the Network Element and the FOT panel.
- Testing of all connections and new spliced with OTDR (or equivalent) test sets.
- Replacement of fiber tails as deemed necessary.
- TAB/db must be updated for both the front and rear terminations of each panel used for this service.

While the Equipment Engineer is responsible for the overall job, they will assign functions to be performed by various subtending work groups. The tails at the OSP panel will require the existing connector to be removed, with at least one-inch of fiber removed along with the connector. The new connector will be fused and reterminated after the Coupler and the Retainer are also changed from the rear of the unit. Subsequent testing can also be accomplished. This may best be accomplished through the use of OSP Construction personnel charging to this TEO. Refer to Section 4D of this document for the changeout process.

The cross-connect jumpers may be placed and tested by Network Operations/LFO between the panels on the Fiber Distribution Frame.

The FOT panels and the jumpers to the Network Elements may be handled by either the **SBC-13STATE** Approved Vendor or internal personnel at the decision of the Equipment Engineer. It is recommended that if any resplicing of Fiber Optic cable is required, that internal OSP resources handle this activity and test the splices.



Warning: Mating an angled polish connector to a flat polish connector will result in high insertion and return loss and possible damage to both connector end faces.

4. Ordering & Processing

There is an incumbent responsibility for all SBC employees to follow the established Procurement Contracts as specified by SBC Product approval Notices and M&Ps under the auspices of the Cross-Functional Sourcing Teams (CFST). If there are any special requests for a non-approved product, SBC employees shall follow SBC-002-200-992, *OTA (One Time Approval) Purchase of Non-Approved Products*, Issue 2, dated Jan 2003. This document may be found on the SBC Internal Web Site: <http://apex.sbc.com>

It is critically important that SBC internal and contracted personnel follow established processes that will engage the proper Subject Matter Experts in their respective Fiber Optic disciplines. Our premiere services will be placed on this equipment and it should meet all SBC expectations and standards before use. The failure to use SBC approved products will potentially jeopardize our network and also place the employee at risk.

4A. SC-APC SingleMode Jumpers

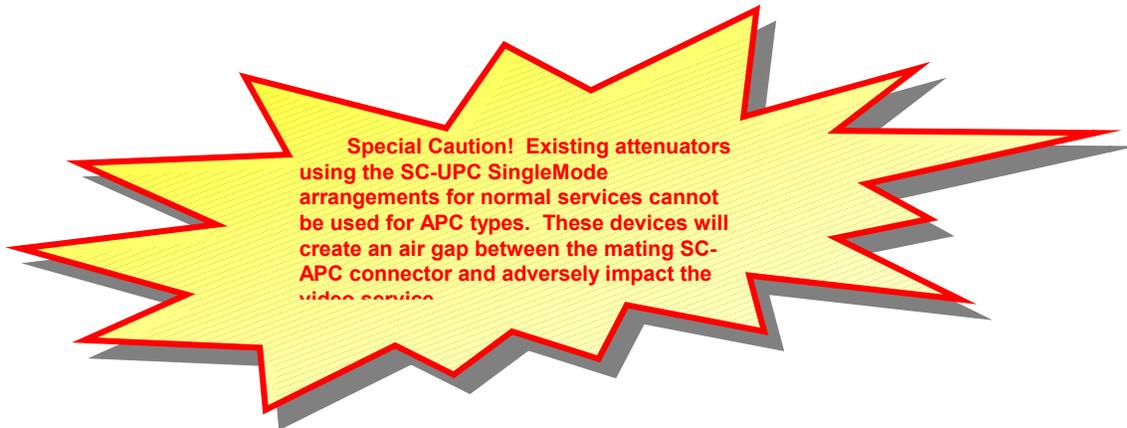
Sourcing/Region	OEM	New PID	SNET PID	Description	VAR Price
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079760	3585050	JUMPER SIMPLEX SM SCA/SCA 15 FT	\$10.39
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079778	3585051	JUMPER SIMPLEX SM SCA/SCA 25 FT	\$10.77
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079786	3585055	JUMPER SIMPLEX SM SCA/SCA 30 FT	\$10.95
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079794	3585056	JUMPER SIMPLEX SM SCA/SCA 35 FT	\$11.14
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079802	3585057	JUMPER SIMPLEX SM SCA/SCA 40 FT	\$11.33
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079810	3585058	JUMPER SIMPLEX SM SCA/SCA 45 FT	\$11.52

KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079828	3585059	JUMPER SIMPLEX SM SCA/SCA 50 FT	\$11.71
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079836	3585060	JUMPER SIMPLEX SM SCA/SCA 60 FT	\$12.08
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079844	3585061	JUMPER SIMPLEX SM SCA/SCA 70 FT	\$12.46
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079851	3585062	JUMPER SIMPLEX SM SCA/SCA 80 FT	\$12.84
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079869	3585063	JUMPER SIMPLEX SM SCA/SCA 90 FT	\$13.21
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079877	3585064	JUMPER SIMPLEX SM SCA/SCA 100 FT	\$13.59
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079885	3585065	JUMPER SIMPLEX SM SCA/SCA 110 FT	\$13.96
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079893	3585066	JUMPER SIMPLEX SM SCA/SCA 120 FT	\$14.34
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079901	3585067	JUMPER SIMPLEX SM SCA/SCA 130 FT	\$14.72
KGP SBC-West CNI SBC-Southwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079919	3585068	JUMPER SIMPLEX SM SCA/SCA 140 FT	\$15.09

SBC-SNET Telamon SBC-Midwest					
KGP SBC-West CNI SBC-Southwest SBC-SNET Telamon SBC-Midwest	Alco Fujikura for SBC-Midwest, all other regions use Corning	301079927	3585069	JUMPER SIMPLEX SM SCA/SCA 150 FT	\$15.47

4B. Attenuators

This service will not initially use attenuation for BPON. Do not place any attenuators in the entire length of the video circuit using the SC-APC SingleMode connectors.



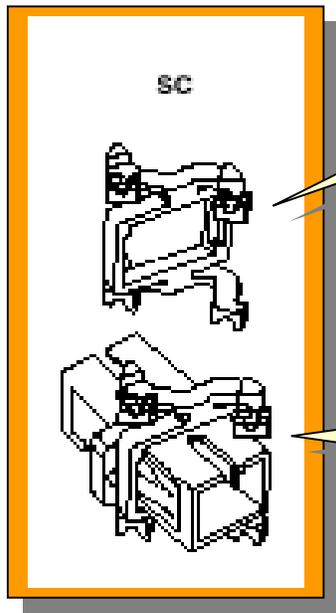
4C. Angled Coupler /Retainers, FDF Panels & Stubs

Sourcing/Region	OEM	Part Number	New PID	SNET PID	Description	VAR Price
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS100F-A	301073540	3584270	PANEL FDF 72 POS ANGLED SC TERM W/ 100 FT STUB	\$2,256.45
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS150F-A	301073557	3584271	PANEL FDF 72 POS ANGLED SC TERM W/ 150 FT STUB	\$2,487.35
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS200F-A	301073565	3584272	PANEL FDF 72 POS ANGLED SC TERM W/ 200 FT STUB	\$2,718.25
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS250F-A	301073573	3584273	PANEL FDF 72 POS ANGLED SC TERM W/ 250 FT STUB	\$2,949.15
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS300F-A	301073581	3584274	PANEL FDF 72 POS ANGLED SC TERM W/ 300 FT STUB	\$3,180.06
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS400F-A	301073599	3584275	PANEL FDF 72 POS ANGLED SC TERM W/ 400 FT STUB	\$3,641.86
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-8L/0DS500F-A	301073607	3584276	PANEL FDF 72 POS ANGLED SC TERM W/ 500 FT STUB	\$4,103.66

Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS100F-A	301073615	3584277	CABLE 72 ACCURIBBON W/ ANGLED SC 100 FT STUB	\$1,145.11
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS150F-A	301073623	3584278	CABLE 72 ACCURIBBON W/ ANGLED SC 150 FT STUB	\$1,376.01
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS200F-A	301073631	3584279	CABLE 72 ACCURIBBON W/ ANGLED SC 200 FT STUB	\$1,606.91
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS250F-A	301073649	3584280	CABLE 72 ACCURIBBON W/ ANGLED SC 250 FT STUB	\$1,837.81
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS300F-A	301073656	3584281	CABLE 72 ACCURIBBON W/ ANGLED SC 300 FT STUB	\$2,068.72
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS400F-A	301073664	3584282	CABLE 72 ACCURIBBON W/ ANGLED SC 400 FT STUB	\$2,530.52
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	IFC-E/ODS500F-A	301073672	3584283	CABLE 72 ACCURIBBON W/ ANGLED SC 500 FT STUB	\$2,992.32
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	SBFCM-6L0000-A	301072716	3584284	PANEL FDF 72 POS W/ ANGLED SC	\$589.54
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	FBA-ASCZ-AR	301072724	3584285	ANGLED SC COUPLER /RETAINER SINGLE TERM FOR PANEL FDF 72 POS	\$14.97
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	FBK-2AJ	301079935	3585072	ANGLED SC COUPLER /RETAINER DUAL CMT TERM FOR PANEL FDF 24 POS CMT	\$37.65
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	FBK-4AJ	301079943	3585073	ANGLED SC COUPLER /RETAINER QUAD CMT TERM FOR PANEL FDF 48 POS CMT	\$75.30
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	FBK-2PJCS	301083085	3585211	DUAL BULKHEAD PLATE SC/APC W/ 3MM PIGTAILS, 3 METERS LONG	\$152.59
Cadence SBC-West SBC-SNET SBC-Midwest	ADC	FBK-4PJCS	301083077	3585212	QUAD BULKHEAD PLATE SC/APC W/ 3MM PIGTAILS, 3 METERS LONG	\$305.18
CNI SBC-Southwest	ADC	SBFCM- 8L/ODS100F-A	30107340	3584270	PANEL FDF 72 POS ANGLED SC TERM W/ 100 FT STUB	\$2,256.45
CNI SBC-Southwest	ADC	SBFCM- 8L/ODS150F-A	301073557	3584271	PANEL FDF 72 POS ANGLED SC TERM W/ 150 FT STUB	\$2,487.35
CNI SBC-Southwest	ADC	SBFCM- 8L/ODS200F-A	301073565	3584272	PANEL FDF 72 POS ANGLED SC TERM W/ 200 FT STUB	\$2,718.25
CNI	ADC	SBFCM-	301073573	3584273	PANEL FDF 72 POS	\$2,949.15

SBC-Southwest		8L/0DS250F-A			ANGLED SC TERM W/ 250 FT STUB	
CNI SBC-Southwest	ADC	SBFCM- 8L/0DS300F-A	301073581	3584274	PANEL FDF 72 POS ANGLED SC TERM W/ 300 FT STUB	\$3,180.06
CNI SBC-Southwest	ADC	SBFCM- 8L/0DS400F-A	301073599	3584275	PANEL FDF 72 POS ANGLED SC TERM W/ 400 FT STUB	\$3,641.86
CNI SBC-Southwest	ADC	SBFCM- 8L/0DS500F-A	301073607	3584276	PANEL FDF 72 POS ANGLED SC TERM W/ 500 FT STUB	\$4,103.66
CNI SBC-Southwest	ADC	IFC-E/0DS100F-A	301073615	3584277	CABLE 72 ACCURIBBON W/ ANGLED SC 100 FT STUB	\$1,145.11
CNI SBC-Southwest	ADC	IFC-E/0DS150F-A	301073623	3584278	CABLE 72 ACCURIBBON W/ ANGLED SC 150 FT STUB	\$1,376.01
CNI SBC-Southwest	ADC	IFC-E/0DS200F-A	301073631	3584279	CABLE 72 ACCURIBBON W/ ANGLED SC 200 FT STUB	\$1,606.91
CNI SBC-Southwest	ADC	IFC-E/0DS250F-A	301073649	3584280	CABLE 72 ACCURIBBON W/ ANGLED SC 250 FT STUB	\$1,837.81
CNI SBC-Southwest	ADC	IFC-E/0DS300F-A	301073656	3584281	CABLE 72 ACCURIBBON W/ ANGLED SC 300 FT STUB	\$2,068.72
CNI SBC-Southwest	ADC	IFC-E/0DS400F-A	301073664	3584282	CABLE 72 ACCURIBBON W/ ANGLED SC 400 FT STUB	\$2,530.52
CNI SBC-Southwest	ADC	IFC-E/0DS500F-A	301073672	3584283	CABLE 72 ACCURIBBON W/ ANGLED SC 500 FT STUB	\$2,992.32
CNI SBC-Southwest	ADC	SBFCM-6L0000-A	301072716	3584284	PANEL FDF 72 POS W/ ANGLED SC	\$589.54
CNI SBC-Southwest	ADC	FBA-ASCZ-AR	301072724	3584285	ANGLED SC COUPLER /RETAINER SINGLE TERM FOR PANEL FDF 72 POS	\$14.97
CNI SBC-Southwest	ADC	FBK-2AJ	301079935	3585072	ANGLED SC COUPLER /RETAINER DUAL CMT TERM FOR PANEL FDF 24 POS CMT	\$37.65
CNI SBC-Southwest	ADC	FBK-4AJ	301079943	3585073	ANGLED SC COUPLER /RETAINER QUAD CMT TERM FOR PANEL FDF 48 POS CMT	\$75.30
CNI SBC-Southwest	ADC	FBK-2PJCS	301083085	3585211	DUAL BULKHEAD PLATE SC/APC W/ 3MM PIGTAILS, 3 METERS LONG	\$152.59
CNI SBC-Southwest	ADC	FBK-4PJCS	301083077	3585212	QUAD BULKHEAD PLATE SC/APC W/ 3MM PIGTAILS, 3 METERS LONG	\$305.18

4D. The Changeout Process

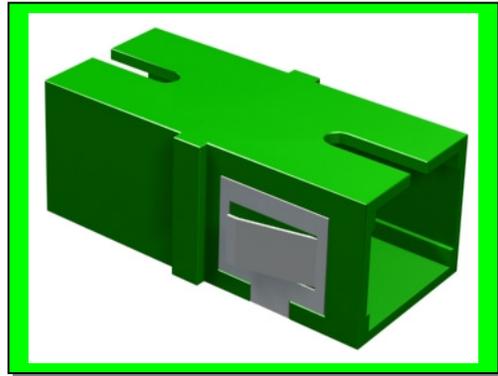


This is the retainer that fits over the coupler and seats on the panel

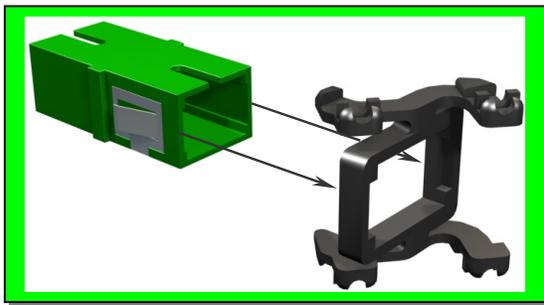
This is the coupler that permits the connector to seat on only orientation to mate with the other angled connector on the other side of the panel



SC Angled Retainer Clip



SC Angled Adapter



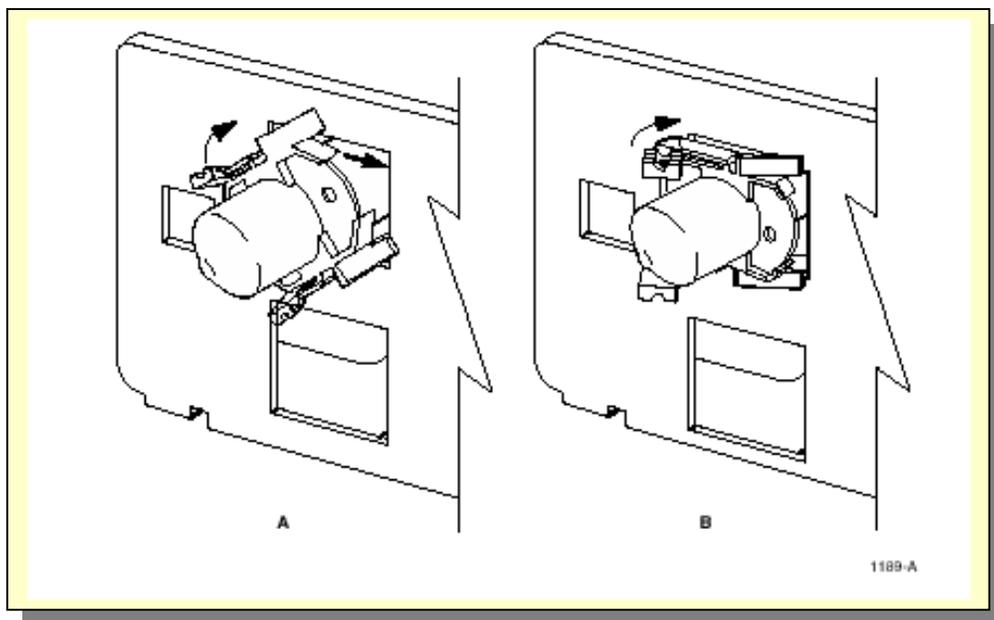
SC Adapter/Retainer Assembly



SC Adapter assembled with Retainer

Placement Steps:

- Insert SC bulkhead adapters from the rear of the retainer until it snaps into place.
- Adapters installed in the left half of the bulkhead must be angled to the left and those in the right half of the bulkhead must angle to the right.
- Orient the adapter/retainer assemblies for installation in the left and right halves of the bulkhead.
- Illustration below shows the installation for the left half of the bulkhead. Illustration for the right half of the bulkhead is a mirror image of the illustration.



- Position adapter/retainer assemblies in the mounting hole in the bulkhead as shown in the illustration
- Rotate the adapter/retainer assembly about 45° clockwise and snap the tab end into the bulkhead as shown in the right illustration above.
- Repeat this procedure for all adapter/retainer assemblies that need to be changed.

Pigtail Installation

Pigtail installation consists of mating the pigtail connector with the bulkhead adapter/receptacle, installing the pigtail and adapter assembly in the CMT, and routing the pigtail to the splice drawer. Pigtails should be at least 118 inches (3 meters) long to facilitate splicing. If the bulkhead adapters/receptacles were previously installed, remove each bulkhead plate from the CMT before beginning pigtail installation.

Use the following procedure to install pigtails.

- Mate each pair of pigtails connectors with the bulkhead adapter or receptacle as shown in the illustration below.
- Apply designation tags to each pigtail for identification in accordance with SBC-TP76300MP-000.

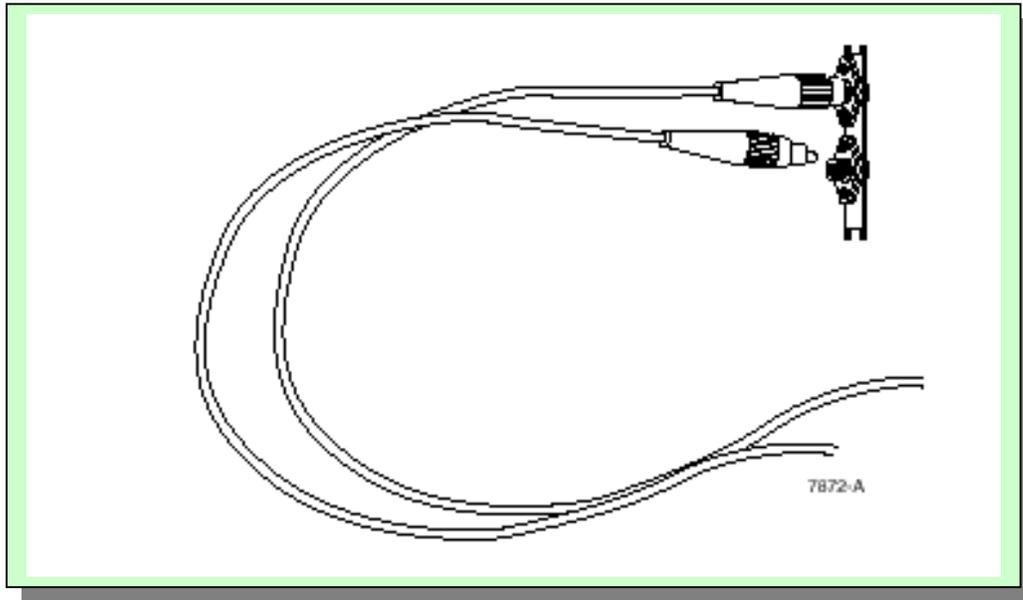


Illustration: Connecting Pigtails to Bulkhead Adapter/Receptacles

- Place the pigtail and mounting plate assembly in the CMT as shown in the illustration. The pigtails should exit the tray near the tray hinge.

Resplicing from one connector type to another:

- Follow SBC-TP76300MP-000.
- Remove the rear connector.
- Remove the front connector to the panel if present.
- Tag it.
- Replace the Retainer and Coupler in the panel.
- Remove the connector and at least one-inch of jumper off the cable.
- Burnish & clean the cable end left on the cable stub.
- Using the proper test equipment, splice the new angled connector to the end of the cable stub.
- Test, Test, and Test.

- Record results.
- Place the new connector into the coupler housing on the panel.

4E. Movie Visual Aid Access

Three Visual Aid Movies have been prepared to address the process:

1. SC-UPC Adapter Removal
2. SC-APC Adapter Retainer Assembly
3. SC-APC Overall Installation

Due to limitations in APEX, these movies may be viewed through access to the internal SBC Local Exchange Carrier Web site: <http://ebiz.sbc.com/commonsystems>

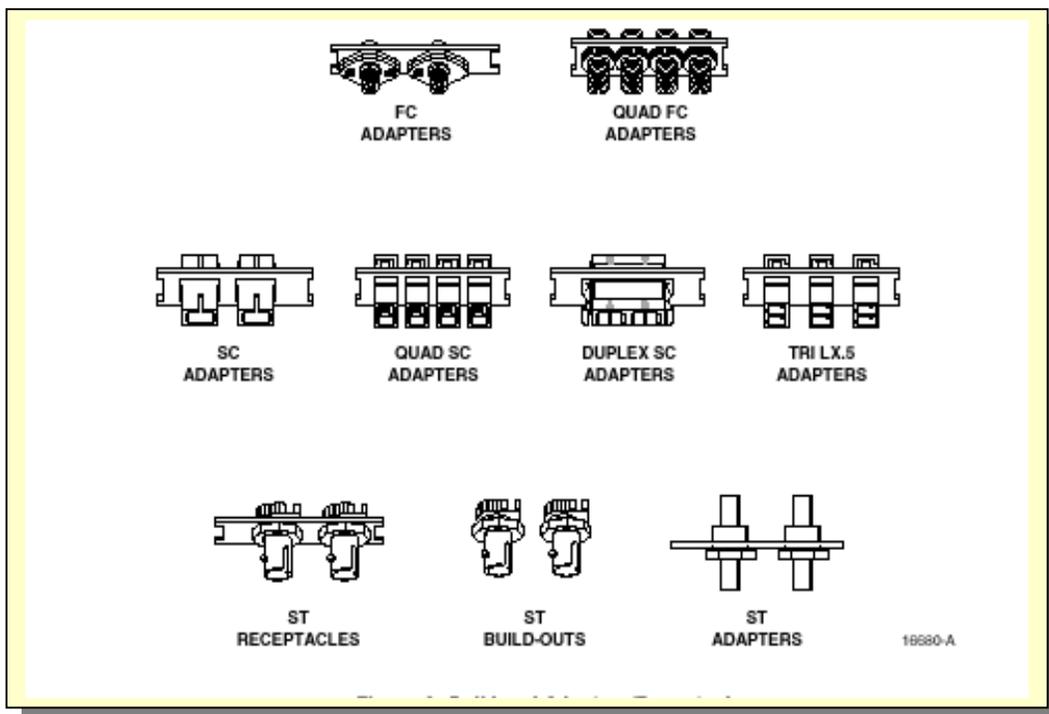


Illustration of connector types used today

5. Circuit Assignments & Management

5A. TAB/db

The Tabular Database (TAB/db) is the inventory management tool for all FDF, panel and port assignments by type for SBC Central Offices. The orientation is to provide support to the Equipment Engineer (NP&E) groups for provisioning of bays and panels. The TAB/db inventory system is being enhanced to cover the dedication of cable assignments on FDF panels. TAB/db will not provide Circuit Level assignment reference points or jumper cross-connect routes.

The Equipment Engineer may begin in 2 ways after creating spec to work in:

- Locate panel which requires connector type changes (if list of panels is available)
 - Query the system for Fiber assignments and check each panel returned by the query for updates.
1. Create a Record Only spec by using A7x if the internal to SBC or V7x if a vendor (where x = the next available number from 0-9).
 2. Once the assignment chart is located select the 1st line to be changed.
 3. Click in the connector type field to activate the drop-down menu and select the appropriate connector type (repeat for front and rear if both are required). **THIS IS A REQUIREMENT FOR BOTH FRONT AND REAR FOR ANGLED CONNECTORS.**
 4. Once the changes are complete click save.
 5. Once the changes are saved select copy special from the edit menu.
 6. Select the next position that needs to be changed and select remove from the status menu.
 7. Select the number of assignments to remove by using the shift key for contiguous positions and the control key for noncontiguous positions. **(Note: be sure they are all assigned to the same network element.)**
 8. Then click OK to remove them.
 9. Select paste multiple from the edit menu.
 10. Select the number of assignments to paste by using the shift key for contiguous positions and the control key for noncontiguous positions. **(Note: be sure they are all assigned to the same network element.)**
 11. Then click OK to paste them with the new connector type.

Standard Assignments - FIBER/FIBER
 Assignment Edit Options Status Actions Equipment Alarm Power Views Help
 CON: KIMBERLY Spec: A70 **RECORD ONLY** Primary CLL: TESTCA01 Floor: 01
 Current CLL: TESTCA99

Group: Current Spec Only

Line	Panel	Conn Type	Wkg or Prot	Catalog Name	Location	Unit Name	DFD Text	Route/Direct	Front Connector Type	Rear Connector Type
1	9	1 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
2	9	2 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
3	9	3 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			BICONIC	SC-UFC	
4	9	4 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			LC-UFC	SC-UFC	
5	9	5 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			MTP-MM	SC-UFC	
6	9	6 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			MTP-SM	SC-UFC	
7	9	7 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			MU-UFC	SC-UFC	
8	9	8 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-APC	SC-UFC	
9	9	9 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			ST-UFC	SC-UFC	
10	9	10 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			UNKNOWN	SC-UFC	
11	9	11 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
12	9	12 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
13	9	13 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
14	9	14 RX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	
15	9	15 TX	FDM SHELF	RR104-14, Rack: GP (Center)	PANEL 10			SC-UFC	SC-UFC	

Unit Name: PNL 9
 Location: RR104-14, Rack: GP (Center)

Buttons: Make/Chg Assignment(s), View H, Save, Detail, or Power in the menu above.

Press F1 for Help

Don't forget to update both the front AND the rear Connector Type Columns here.

The Angled SC-APC Connector is already a selection item on the drop down menu

5B. TIRKS

TIRKS assignments will be made based upon the serving location or the network equipment chosen for the network feed. Through the use of CLLI®, CLFI® and CLEI® codes established by Telcordia Technologies Inc., the assignments are made. The connector type is not inventoried in TIRKS.

A visual inspection of the connector color will be required when the assignment is made. The connector and the sleeve housing will be green in color for SC-APC connectors. If the connector still has the blue SC-UPC connector sleeve in the panel, the connector will either need to be changed or another assignment made in TIRKS.

6. Cable & Patch Cord Routing

Patch Cords are used to make cross-connect terminations from the front of one FDF panel to another. All the patch cords shall be routed in the same manner regardless of the connector used on the panel. These “jumpers” will be routed through the vertical and horizontal routing troughs from one FDF panel to another.

The Patch cords may also be used between the Network Equipment Bay to the back of the FOT panel within the FDF. In this instance, the jumpers will traverse the Central Office between these two locations within a protected Fiber Raceway.

As an alternative, the use of a Satellite FDF may be used which permits the placement of Fiber Cable from a FOT panel located near the Network Equipment in accordance with SBC-002-316-043, *FDF Frame Deployment M&P*, see Section 8.

7. Testing

7A. Test & Turnup Functions

It is strongly recommended that modifications, testing and cross-connect placements be performed during the Maintenance Window (2200-0800 HRS).

The most appropriate benchmark tests for dark fiber are performed using an Optical Time Domain Reflectometer (OTDR) for all readings and recorded. This reading should be performed from the same reference test access point and use the same OTDR. The readings need to be recorded on a permanent basis. Test Equipment will need to be checked to insure that the optical power transmitters and receivers are of good quality capable of identifying an optical signal to the -45 dB range for light measurements. Any optical protocol test sets will be product dependent and will need to be purchased in accordance with manufacturer recommendations. This information will be kept on a sheet in a plastic sleeve, attached to the bay in the Central Office. Properly clean all exterior Fiber Optic contact points using established cleaning procedures. NOTE: OTDR readings should be taken at the 1550 nm transmission level.

When circuits are installed on the BPON arrangement, readings should be taken with an OTDR test set and noted on the sheet in the plastic sleeve, attached to the bay in the Central Office and noted on the OSSCN screen for each circuit in WFA/C.

SBC-TP76300MP-000, Section O, Paragraph 3.2 covers the need to define and record a uniform procedure to measuring losses in field terminated connectors on fiber jumpers, using Power meters and Laser light sources.

Notes:

1. Losses are incurred at interfaces. For example at a fiber to fiber junction, at the fiber to light source junction, at the fiber to power meter junction.
2. The losses due to the fiber splice should be negligible.
3. The losses due to the length of a fiber jumper should be negligible.
4. The ends of the fiber must be properly cleaned before testing
5. The Optical Test Data Sheet Form is located as an attachment to TP76300MP, Section D, , Pacific Bell Detailed MOP, Section B
6. The light source must be a 1550nm source. A light source of any other frequency will result in inaccurate readings. If the application for the tested jumper is either 1310nm or 1550nm the 1550nm source will be used.
7. The Power meter must be set at 1550nm

7A.1. Test Procedure A

This procedure is to be used when:

- a. The connector on the light source is any type (one end of the Test Jumper has the same connector).
- b. The connector on the power meter is an SC Connector

See Figure A and Optical Data Sheet

1. Connect the Test Jumper between the light source and optical power meter.
2. Record the optical power (P1) on the Optical Data Sheet.
3. Disconnect the Test Jumper from the optical power meter
4. Connect one end of the newly constructed jumper to the end of the Test Jumper using an adapter.
5. Connect the other end of the newly constructed jumper to the optical power meter.
6. Record the optical power (P2) on the Optical Test Data Sheet.
7. Subtract P1 from P2 and record the result (Loss) on the Optical Test Data Sheet.
8. If the loss is greater than 0.80B the jumper is not acceptable and should NOT be used.
9. A copy of the Optical Data sheet is to be turned over to the Engineer.

7A.2. Test Procedure B

This procedure is to be used when:

- a. The connector on the light source is not an SC connector
- b. The connector on the power meter is not an SC Connector

See Figure B and Optical Data Sheet

1. Connect one Test Jumper to the light source,
2. Connect one Test Jumper to the optical power meter.
3. Connect the two Test Jumpers together with an adapter.
4. Record the optical power (P1) on the Optical Data Sheet.
5. Connect one end of the newly constructed jumper between the two Test Jumpers with adapters.
6. Record the optical power (P2) on the Optical Data Sheet.
7. Subtract P1 from P2 and record the result (Loss) on the Optical Data Sheet.

8. If the loss is greater than 0.80dB the jumper is not acceptable and should NOT be used.
9. A copy of the Optical Data sheet is to be turned over to the Engineer.

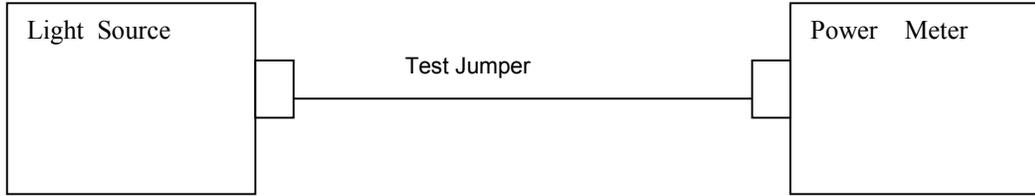


Figure A1

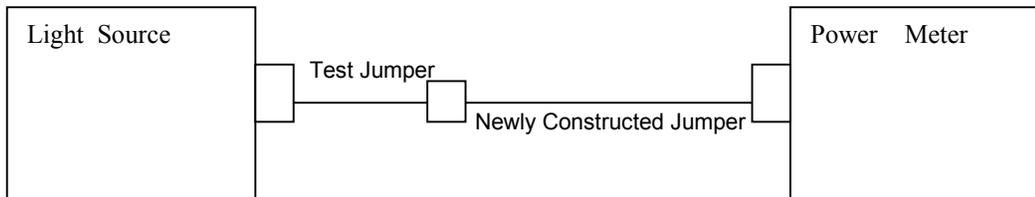


Figure A2

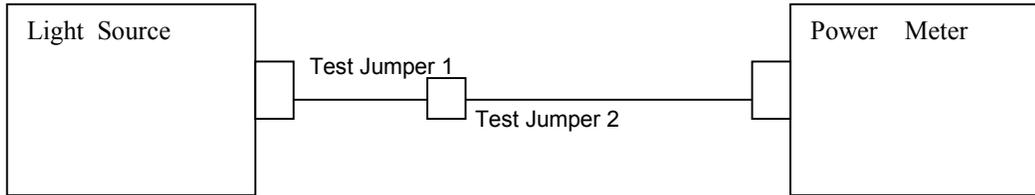


Figure B1

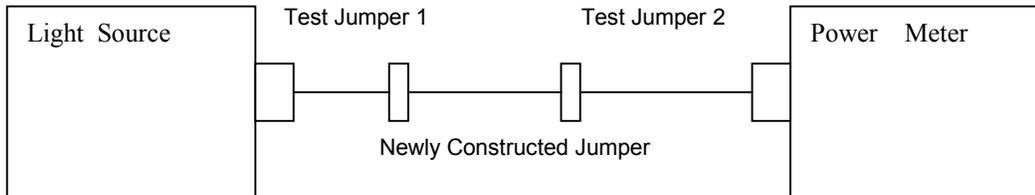
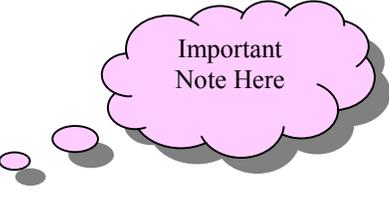


Figure B2



Important
Note Here

7B. Cautions & Protective Care

1. First and foremost, it is extremely critical that all technicians working on Fiber Optic technology take proper precautions with regard to laser transmissions that will be concentrated and directed toward the working employee. **Do not expose eyes to this optical transmission and insure that all end caps and/or terminators are properly placed on FDF ports.**
2. Measure the Power Level of the combined signal (Understand that the power level of each channel is additive to the combined signal.) Most Fiber Optic transmissions operate in the negative (-) dB range, but with newer Fiber Optic technologies, especially with long reach transmitters, the potential exists to have a positive (+) dB power level.
3. Expect the actual measured power level loss to be 3 dB when traversing each combined path. Insure that your calculations account for this in your optical loss budget.
4. Based upon recent Telcordia Technologies findings, burnishing or cleaning the ends of the fiber connections is the normal expected process before service is placed on the fiber connections. With the advent of new higher power services, this method must be modified per the following table:

When to Burnish/Clean Fiber Optic Terminations

Power Level	Burnish/Clean	Impact
< + 15 dB ¹	Yes	Cleaning will have no effect on the Fiber Termination
+ 15 to + 29 dB	On an exception basis (where field splicing is being performed) BPON is here	A thorough evaluation must be made to insure there are no working alternatives and the end must be cleaned in order for the service to work adequately
+ 30 dB or greater	No	This high power level will cause the burnished end to seriously degrade and fail

¹ Single Fiber Optic transmissions are typically in the -10 to -20 dB power level range. With the advent of combined wavelength technologies such as WDM & DWDM, the combined power level may rise to the positive power level readings, since power levels are additive when optical signals are combined.

8. References

For further information or electronic copies of this document and related information, visit the internal SBC Local Exchange Carrier Web site: <http://ebiz.sbc.com/commonsystems> or <http://apex.sbc.com>

Document	Description	Issue & Date
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SBC-002-216-074	SBC-Demarcation Policy for Access Services	Issue 2, June 2001
SBC-002-216-266	SBC-Turn-up and Test for FTTH	Issue 2, Nov 2002
SBC-002-316-043	SBC-FDF Frame Deployment M&P Replaces AM-915-890-953 effective Dec 2001 Replaces AM IL 95-07-017 effective Dec 2001	Issue 4, Jan 2003
SBC-002-316-053	SBC-Fiber Raceway Deployment M&P	Issue 3, Jan 2002
SBC-002-316-066	SBC-Breakout Bay Deployment in Support of the NORTEL OPTera Connect DX System	Issue 2, May 2002
SBC-002-316-069	SBC-Fiber Optic Protection M&P	Issue 1, Jan 2003
SBC-002-316-072	SBC-BPON FTTH Common Systems Provisioning (SBC-West)	Issue 1, Jan 2003
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