Instructor Corner
Simplifying Splicing Challenges

With the advent of automatic fiber selection, multiple splicing programs, and automatic arc calibration features, the technician’s job in front of the splicer has become easier than ever. Despite these advances in technology, a number of extrinsic and intrinsic factors still present challenges for the technician.

As newer bend-insensitive fibers are spliced to older legacy fibers, the technician must be able to visually recognize what is taking place. Most new splicers have built-in splice programs and the ability to splice these two fiber types together easily and effectively. Nevertheless, the technician must make a quick visual inspection of the splice to determine that it is acceptable. There are instances where the splicer’s estimated loss may be outside tolerances, yet testing the fiber with an OTDR shows that the splice is well within parameters and industry standards.

In the graphic above, standard ITU-T G.652D fiber is being spliced to ITU-T G.657A fiber. The fibers are from the same manufacturer, and the pre-splice measurements show good cleave quality and alignment. After splicing is complete, a fine line becomes apparent. In the past, field technicians may have viewed this as a bad splice, and broken the fiber to

Continued on Pg. 2

Fiber Optic Splicing Training DVD

Low loss splicing is the cornerstone of optical network performance. Learn about the various types of mechanical and fusion splicers and how each operates. Step-by-step procedures for how to prepare and cleave fibers for splicing are covered. Special Price $99 when you order online using discount code: SPLICE. This offer is valid until October 31, 2015.

Order Now
Did You Know...

That Sensing Uses Fiber Optic Technology?

When someone lists applications for fiber optics, voice, video, and data are first to come to mind. However, employing fiber in sensing applications is becoming increasingly common. Fiber Bragg Grating sensors monitor structural integrity in pipelines, buildings, bridges, and even aircraft. Distributed sensing can test for an array of environmental indicators: temperature, pressure, strain, acoustical, and more. In distributed sensing, the fiber itself is the sensor! Optical fiber's key advantage is that it delivers discrete measurements without the risk of being affected by electromagnetic or radio interference. Optical sensing is expanding into amazing new areas from automobile safety to space exploration. ■

Standards Review

TIA-598 Color Code

If you’ve ever wondered how optical fiber tube and buffer colors are standardized, look no further than the TIA-598 “Optical Fiber Cable Color Coding” standard. This standard is the foundation for how optical fibers, fiber ribbons, indoor cables, and cordage (pigtailed and jumpers) are colored. A numerical sequence is applied for each color, helping technicians and splicers to properly identify, terminate, and route fibers. These color codes aid engineers in the creation of diagrams for the fiber mid-entries required for accessing feeder and distribution segments. The TIA-598 standard also addresses the hue of the colors themselves based on the ANSI/EIA-359 “Colors for Color Identification and Coding” standard.

Although this standard was updated in July 2014, the next revision will face some challenges. The first will be to incorporate four new colors (Lime, Tan, Olive, and Magenta) designated for 16-fiber ribbons and connectors. Other challenges include deciding whether to address bend-insensitive fibers, plus the official acceptance of the Erika (Heather) violet color for OM4 multimode fiber. ■

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Resplice. Testing the splice shows that the fibers are fully compatible and losses are well within the industry standard. The fine line is a visual problem caused by the melting characteristics of the two dissimilar fiber types. This same result also can occur when splicing multimode fibers due to the mixing of various layers of glass (graded index fiber) at the fibers ends. It can be seen easily in the post splice image on the fusion splicer.

Other splicing defects — such as bubbles, bulges, or necked down splices — can be caused by a number of factors. A bubble in the splice typically results from contamination that was not removed during the pre-arc burning of the electrodes. These issues can be eliminated by cleaning the fiber and cleaver. Fat or bulge splices occur when the splicer is not set to the correct arc calibration and the X and Y motors compress the fibers too far during the pre-arc and during the final splice process. Necked down or thin splices occur when excessive heat or fiber overlap is experienced. ■
Best Practice

Safe Disposal of Fibers

While splicing or terminating optical fibers, pieces of fiber are cleaved off or can break off in the stripping process. This glass is very small, sometimes nearly microscopic. It is difficult to find, harder to remove, and can be quite dangerous. Fiber shards can get stuck in clothing, onto hands, and into the skin. If they were to end up in your lunch, they could lead to internal bleeding and conceivably death.

The fiber technician not only has the responsibility for his or her own safety, but for the safety of others who may come in contact with this fiber. Fiber scraps should never be thrown on the ground, on a floor, or openly placed in wastebaskets. Fiber debris should be confined in a special container or bagged in a plastic zipper storage bag, sealed, and then placed into a trash bin separate from those handled by the office cleaning staff.

Fiber Optic Safety Training DVD

An excellent safety primer for anyone working with fiber optic systems, components, fibers and chemicals whether it’s in a lab, on the manufacturing floor, or as an end user. Learn the importance of understanding laser types and how to protect your eyes when using optical light sources and amplifiers. Special Price $99 when you order online using discount code: SAFETY. This offer is valid until October 31, 2015.

Light Brigade News

Certified Fiber to the Home Professional Training Program Updated

Earlier this year, Light Brigade subject matter experts worked in conjunction with the FTTH Council to bring the Certified Fiber to the Home Professional (CFHP) training program and certification examination up to date with the latest in fiber optic technology for 2015.

Following the release of the new course materials and examination, Light Brigade FTTx experts revisited the online version of our CFHP course and made modifications to bring it in line with the new examination requirements. The most significant additions to the course center on the recently-released ITU-T G.989 WDM-PON standard. The course content delivers a thorough explanation of next-generation and WDM-PON network requirements and their impact on both legacy and next generation PON systems. This includes new wavelength allocations and coexistence when migrating to higher-speed systems.

In addition, the 75-question practice exam has been revised to better prepare our attendees to take the actual certification exam upon completion of the online training program.
Upcoming Classes
Click on Location to Register

### Fiber Optics 1-2-3
- **Richmond, VA** September 15-18
- **Calgary, AB** September 15-18
- **Tampa, FL** September 22-25
- **Seattle, WA** Sept 29-Oct 2
- **Albany, NY** Sept 29-Oct 2
- **Winnipeg, MB** October 5-8
- **Indianapolis, IN** October 6-9
- **Fresno, CA** October 13-16
- **Honolulu, HI** October 20-23
- **Columbus, OH** October 20-23
- **Jackson, MS** October 27-30
- **Anchorage, AK** October 27-30
- **New Orleans, LA** November 3-6
- **Reno, NV** November 10-13
- **Alameda, CA** November 10-13
- **Birmingham, AL** November 17-20
- **Austin, TX** November 17-20

### Advanced Hands-on Training
- **Denver, CO** October 13-16
- **San Juan, PR** October 13-16

### Emergency Restoration
- **Seattle, WA** September 29-30
- **Indianapolis, IN** October 6-7
- **Salem, OR** November 3-4

### FTTx for Installers and Technicians
- **Portland, OR** September 15-18
- **Charlotte, NC** Sept 29-Oct 2
- **San Antonio, TX** October 20-23
- **San Juan, PR** October 20-23
- **Anchorage, AK** November 17-20

### FTTx OSP Design
- **San Juan, PR** September 15-17
- **Denver, CO** October 27-29

### Fiber Optics for ITS, Traffic, Fire Alarm, and Communication Systems
**Technician Level I**
- **Denver, CO** September 21-22
- **Daytona Beach, FL** September 28-29
- **Kansas City, KS** October 5-6
- **Las Vegas, NV** October 26-27

**Field Technician Level II**
- **Denver, CO** September 23-24
- **Daytona Beach, FL** Sept 30-Oct 1
- **Kansas City, KS** October 7-8
- **Las Vegas, NV** October 28-29

**Design Technician Level II**
- **Denver, CO** September 25
- **Daytona Beach, FL** October 2
- **Kansas City, KS** October 9

### Fiber Optics for Utilities
**Level 1 Technician**
- **Hartford, CT** September 22-24
- **Burbank, CA** October 6-8
- **Portland, OR** November 3-5

**Level 2 Designer**
- **Hartford, CT** September 25
- **Burbank, CA** October 9
- **Portland, OR** November 6

### Fiber Characterization
- **San Jose, CA** November 23-25

### Fiber Optics for Oil/Gas
- **Edmonton, AB** September 22-25
- **Houston, TX** October 20-23

### Fiber Optics for Mining
- **Sudbury, ON** November 23-25

### Fiber Optics for Pro A/V and Broadcast
- **Dallas, TX** October 27-30
- **Anaheim, CA** November 17-20

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**Your Choice Summer Special**
Register two or more attendees for any Light Brigade training class*, and take your choice!
15% off the regular course fee OR free ETA certification for every attendee.
You can even choose to send one student to two different courses to take advantage!

To register and make your choice, call 1-800-451-7128 and ask for discount “August News”.

*“Your Choice” summer special applies only to standard classes held in August – September 2015*
Product Application
Always Clean Before You Connect

When it comes to cleaning fiber optic connectors, we’ve heard it all! “These are new jumpers – no need to clean.” “I just brush it on my shirt and it works fine.” Or “I cleaned my test port last week and I keep the cap on it.” Need I go on?

First, let’s set the record straight. Dust caps are just what they sound like – little caps that can be filled with dust. Just because a connector or an adapter has the dust cap on it does not mean you don’t have to clean it. Every connector should be cleaned and inspected before every mating. Period.

Now that we have that cleared up – what should you use for cleaning? Always use products specifically designed and proven to work for fiber optic connectors. Tissues, cotton and other fabrics don’t work because they leave too much lint behind. There are many good products out there that work on all types of connectors and can clean through bulkheads. There are cleaning sticks, one-click cleaners, cassette cleaners like the popular Cletop units, wipes, and special solvents for oils and hard to clean residue.

Make sure your network will perform at its highest capacity. Always clean before you connect. ■

For more information on cleaning supplies or any other product, call us at 206.575.0404

Upcoming Events
Click on Any Event for More Information

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<td><strong>OSP EXPO</strong></td>
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<td>• Short Course: <strong>Testing and Troubleshooting FTTx Networks</strong>, September 1, 1:00pm - 5:00pm</td>
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<td>• Training Course: <strong>Certified Fiber to the Home Professional</strong>, September 17-18, 8:00am - 5:00pm</td>
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**Free Training Webinars**

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