

# Fiber Optic Video Jacks for Outdoor Sporting Venue

## Customer Challenge

A customer approached Winchester Interconnect due to issues with the reliability of their fiber broadcast network. They had over 800 fibers terminating in a rack with ST connectors for patching capability; every day they would patch from different sources into the broadcast equipment. Each time there was a connectivity issue, all of the connections between the camera and the final destination had to be checked and cleaned.

The typical process was to place the camera on the field, attach it to the Broadcast Service Panel in the field, then mate the correct fiber connections to transmit the signal over the cable and live to air. With the large number of matings and unmatings every day, reliability was poor. Additionally, fault finding was challenging, as it was unknown whether it was the outdoor fiber, indoor fiber, or the patch cables that were at fault. This required 3 or 4 people using walkie talkies to mate and unmate connectors, attempt to clean them, and try to bring the signal up. Even if the signal was brought up, movement of the connectors or fiber could still result in the signal being lost.

## Challenge Review

The following application requirements were provided by the customer:

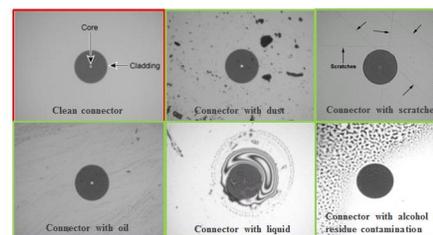
- No cleaning required
- Mating cycle life well above 5,000 cycles.
- Input and output on the rear of the video jack
- Density of at least 48 fibers in a 19-inch 1.5RU rack
- Passive solution with no power required
- No impact to signals in the fiber
- Insertion loss typically 1dB and return loss 40dB

Conventional Fiber Optic connectors are designed so the fiber center cores butt together, known as 'butt joint' or physical contact connectors. It is critical that the two fiber cores maintain contact and alignment when mated to minimize signal loss.

To maintain contact, all PC connectors have a spring pushing the fibers together. As the fiber connectors are mated, the ferrules holding the glass fibers touch, compressing and allowing the glass to touch with a force of a few pounds. The core of the fiber is around 9 microns (.009 mm or .0004 in.). Typical dust particles in the air of a normal office environment are 2 to 30 microns, so there is a very real and ever-present risk that when a connector is unmated and then remated, a dust particle will settle on the glass.



Standard Physical Contact Fiber Optic Connectors

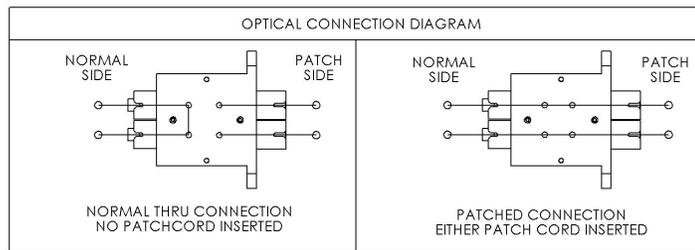


Types of Contamination

Dust particles getting on the glass can do two things, worst-case it will block all the light and no signal will pass through, or it will sit on the glass and not block the light, but it will scratch or pit both connector surfaces. If that chipped, scratched, or dirty connector mates with another connector, it can transfer the dust, scratch the connector, or move any existing dust into a place that will block the light. 'Dirty' connectors refer to a speck of dust that is invisible to the naked eye, and generally impossible to remove without special cleaning tools or fluids. Wiping the connector on a piece of cloth will likely scratch it. It is a random occurrence, so it may be possible to do 10 or even 100 matings without seeing a performance drop due to dust, but it is certain that after a number of matings without proper cleaning, the optical performance will drop or the signal will disappear altogether. Further complicating matters, unmating and remating may bring the signal back, or may permanently damage the fiber.

### Winchester Solution

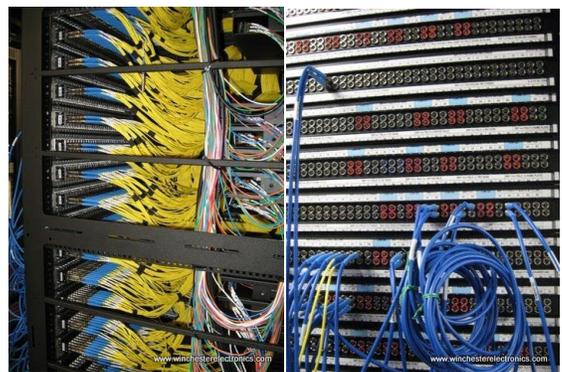
Our engineers designed and patented EL Series Fiber Optic Video Jack. Due to the increased reliability and performance achieved, this groundbreaking device was recognized by the IABM as the most innovative broadcast product, and TV Technology recognized it with its STAR award for Superior Technology.



### Customer Improvement

Implementing the EL Series Fiber Optic Video Jack allowed the customer to ensure the correct input could be connected to the correct output by using the patch cable. By doing so they were able to guarantee a good signal every time.

When faults occurred, they were easily able to diagnose and remedy the issue so that signal would resume. The elimination of connection problems in the studio combined with the reduction in fault finding time for field issues saved the customer many hours of maintenance and offered a rapid return on investment. Since the initial installation, no video jack has failed and no patch cord has ever required cleaning.



EL Video Jack Installation in Florida Sporting Venue