

## 3M Pleated Foil Cable and Connector Termination Issues

Cabling for the SVX Sequencer to Interface Boards requires that the shield be used as a ground return for the signals. Recently it has been determined that the cable assemblies from outside vendors vary from the proposed 3M assembly instructions. Additionally we have determined the need for a better long term reliable ground connection from shield to connector case.

The correct termination scheme for the pleated foil cables we specify in our detector requires close attention to detail.

The issue are:

- Pleated Foil Shield connection to termination connector
- Pleated Foil Shield connection to connector shell
- Pleated Foil Shield connection integrity to ground over time due to corrosion.

### Pleated Foil Cable

Two types of pleated foil cable are being used thus far. Both will require close attention to the proper connection of the pleated foil shield cable to the connector. More detail information is available through 3M. The spec sheets for these cables are found at these URL's.

The 50 conductor pleated foil cable is 90211/50 by 3M inc. The electrical spec is found at this URL.

<http://www.mmm.com/interconnects/pdf/ts0598.pdf>

The 68 conductor pleated foil cable is 90201/68 by 3M inc. The electrical spec is found at this URL.

<http://www.mmm.com/interconnects/pdf/ts0402.pdf>

### Cable termination Connector

After the signal conductors are swaged onto this connector the pleated foil shield will need to be lapped to the metal part of the connector and secured by a stable adhesive such as conductive epoxy. This will insure a good 100% coverage of the signals to the connector termination.

The cable connectors are for 50 or 68 pin cable are below

10150-6000EC for 50 conductor; and 10168-6000EC for 68 conductor. Both by 3M inc.

The connector URL's are found at this URL:

<http://www.mmm.com/interconnects/pdf/ts0423.pdf>

### Connector Shell for Pleated Foil Cable

The connector shell kit comes with a conductive elastomer that assures a good connection from the shell to the pleated foil shield. The elastomer is included with the metal shell assembly. In one of the assemblies I received the elastomer was not installed.

See these URL's for the shells

The Shell for the 50 conductor cable is 10350-1230-00 by 3M. The URL for tech sheet is

<http://www.mmm.com/interconnects/pdf/ts0396.pdf>

The Shell for 68 conductor cable 10368-A230-00. The URL for tech sheet is

<http://www.mmm.com/interconnects/pdf/ts0355.pdf>

### Elastomer Location Reference

General pleated foil connector assemblies can be seen in this tech sheet. On page 3 of this reference. A cut away view of the shell shows the proper location of the silicone conductive elastomer.

Pleated Foil I/O cable assembly tech sheet is at this URL.

<http://www.mmm.com/interconnects/pdf/ts0804.pdf>

### Pleated Foil Shield Plating

The area of the cable where the silicone elastomer connects to the pleated foil shield will need to be plated with silver. This will insure that the ground connection will not become corroded and fail to make contact. A silver plating solution is available called Cool-Amp silver plating powder. The powder is mixed with water into a paste that is worked onto the shield with a rag or swab. The shield surface is then rinsed with water and dried. The spec sheet is found at this URL.

<http://www5.thomasregister.com/ss/.427788734/catfrm.cgi?&index=Company&search=cool+amp&seq=1&pn=&state=&pdm=&footer=Catalog>

### Cable Assembly Examples and Lessons

Three cable assemblies are herein discussed that to varying degrees are not correct according to our need.

- The first example is a 68 conductor cable assembly which has a major problem since there is no ground from the case to the foil shield. See figure 1.
- The second example is better but the foil shield does not extend to the connector housing. See figure 2.
- The third example is better yet but the foil shield is not plated in the area of the elastomer gasket. See figure 3.

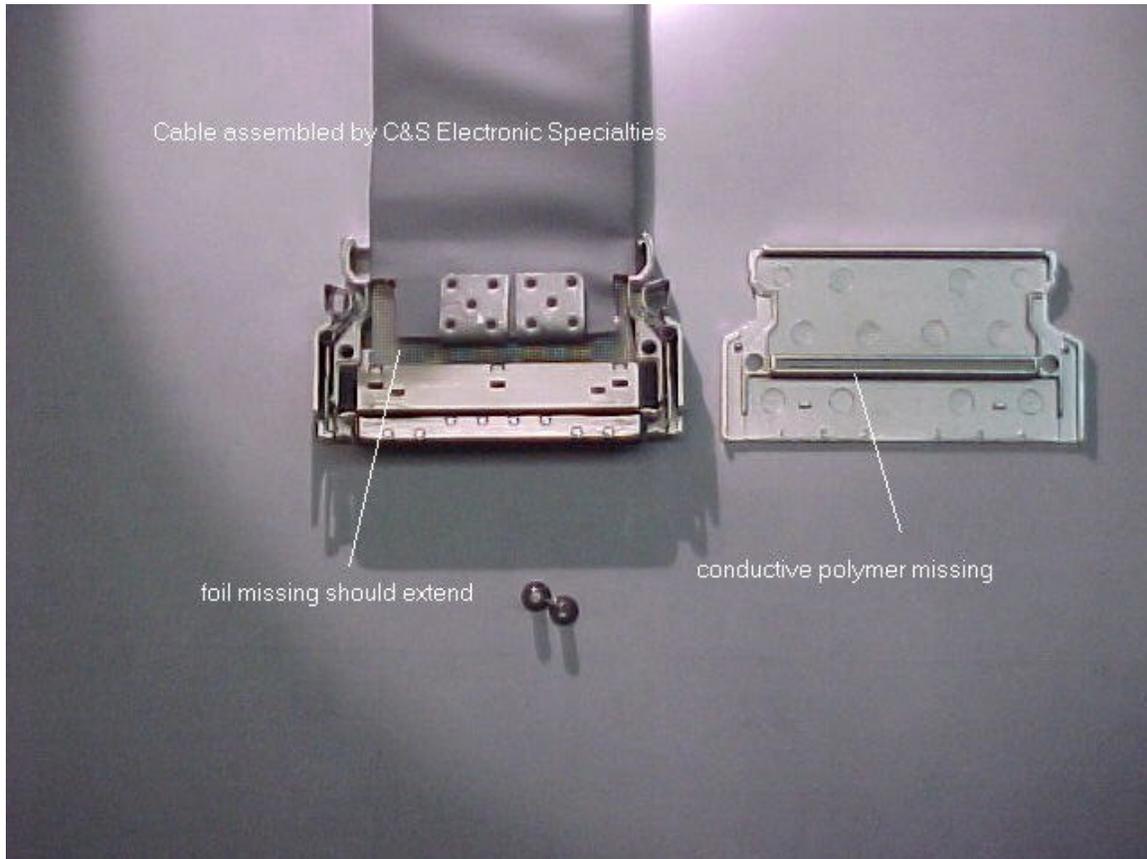


Figure 1

Please note in the above picture that no foil shield is exposed. The elastomer is missing from the connector shell. The result is a poor ground to the foil shield. Pictured above is plated foil cable type 90201/68 with a 10168-6000EC connector and a 10368-A230-00 metal shell.

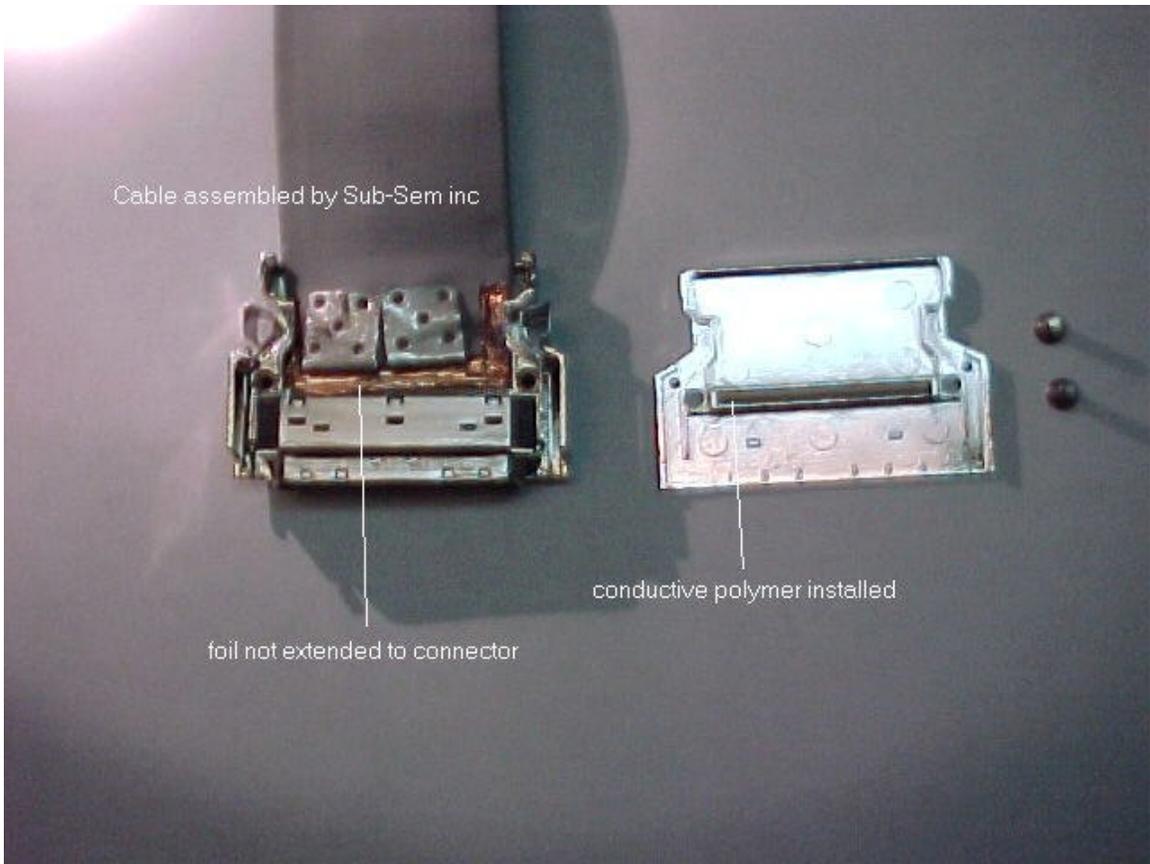


Figure 2

This example shows that the foil shield does not make contact with the connector housing. Better than example 1 since the conductive elastomer will make contact with the shield. Pictured above is 90211/50 cable with a 10150-6000EC connector and a 10350-1230-00 connector shell.

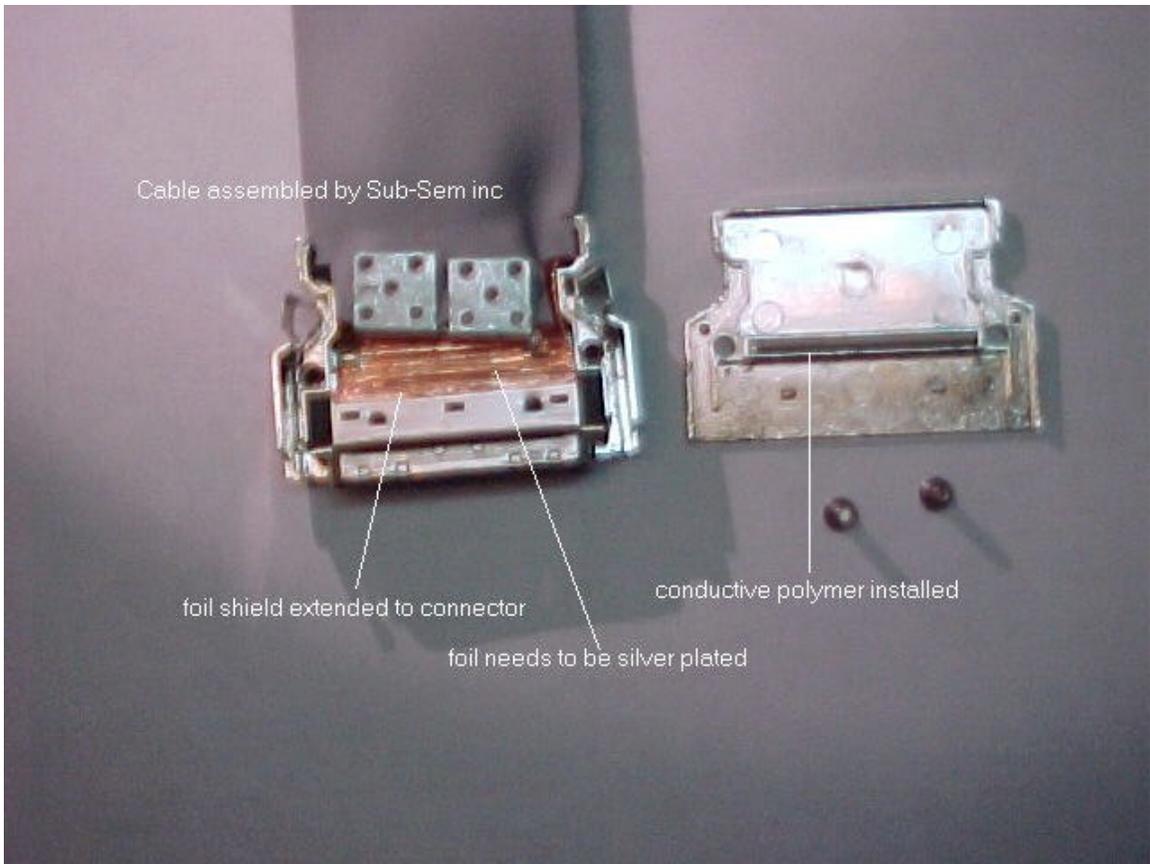


Figure 3

This example is closest to the desired termination. The only thing missing is the silver plating of the shield in the area where the elastomer contact is made. Pictured above is 90211/50 cable with a 10150-6000EC connector and a 10350-1230-00 connector shell.