Building Coaxial Cable

Note: This is just one of many different styles and types of termination.

Introduction

One of the benefits of the Home Network system is the ability to distribute a variety of signals using multiple media types.

Coaxial (coax) cable is generally used for the distribution of video transmissions throughout a residence or commercial building. Security camera equipment, TV antenna, cable TV, or Direct Satellite Systems may generate the video signal.

You have already learned how to build and test twisted pair cable. In this section you will learn how to terminate coaxial cable.

Objectives

At the end of this section, you should be able to:

- Identify three applications requiring coaxial cable
- Describe maximum and minimum cable specifications for RG6 cable
- Identify the tools required to terminate coaxial cable
- Describe the process used to terminate coaxial cable
- Identify the top three problems associated with terminating coaxial cable

Applications Using Coax Cable

Like twisted pair, coax cable can be used for computer applications; but for this class, we are only concerned with the following applications:

- Satellite TV
- Cable TV
- Security
- Antenna
- Modulation
Coax Cable Specifications

Coaxial cable comes in a variety of grades. The grade that is recommended is a quad shielded RG6 cable. RG6 cable is recommended because it is heavily shielded from electrical interference.

Installing RG6 is fairly simple, but there are some installation issues that need to be followed:

- Never pull coax cable in a conduit that is also used for electrical power.
- Avoid installing coax cable over any object or device that may give off electrical interference such as fluorescent lighting and high voltage transformers.
- Avoid bending cable too tightly--no tighter than four times its diameter.

Figure 5-1 Illustrates the general parts of coax cable.

Depending on the type of coax cable you are using, there may be more or less shielding. You will use RG6 Quad Shielding cable in this class.

FutureSmart recommends RG6 quad shielded cable because it limits the EMI & RFI (electromagnetic interference); it also limits the broadcast capabilities of the cable so that the signal only goes where it is intended.
Tools Required for Making Coax Connections

The tools required for coax connections are straightforward and relatively inexpensive. They are as follows:

- Coax Stripper
- Compression Tool
- Cable Cutters
- Connectors

Creating Coax Cables

Coax cable is fairly simple to terminate if you have the right tools. The following steps illustrate the process of making a coax connection using RG6 cable and connectors.

Preparing the Cable for Connectors

1. Assemble cable, connectors and tools.

2. Cut the coax cable with wire cutters or cables cutters so you have a squared end, as illustrated in Figure 5-2.

![Figure 5-2: Coax RG6 Cable with End Squared](image)

3. Now insert one end of the coax cable into the coax stripper as illustrated in Figure 5-3.

![Figure 5-3: Coax Cable Inserted into Coax Stripper](image)
The stripper acts as a jig and will cut the cable to the right depth and length required for the connector.

4. Rotate the stripper completely around the cable. You will hear a grinding noise that indicates the tool is cutting through the PVC outer coating shielding and into the die electric.

5. Rotate the tool until it seems to rotate easily, with little resistance. Squeeze tip of tool and rotate one complete turn.

6. Remove the cable from the tool by pulling stripper outward and discard the stripped-off insulation.

The cable end should now resemble Figure 5-4.

![Figure 5-4: Coax Ready for Connector Assembly](image)

7. Peel back three layers of the shielding and pull forward lightly.

The cable is now ready to add the connector.

**Adding Coax Connectors**

The following steps will guide you through the process of adding connectors to your coax cable segment.

1. Insert the prepared cable into the connector, twisting gently to seat the cable into the connector, make sure that copper center goes into white plastic boot that is inside the connector. Figure 5-5.

![Figure 5-5: Insert Coax Cable into Tool](image)

2. Check to see that the copper conductor almost meets the back of the connector and that plastic boot comes out of connector as illustrated in Figure 5-6.
3. Inspect the cable end. The white dielectric insulation should be pushed all the way forward and sitting flush with the top of the connector. In the illustration, 

**Crimping the Coax Connector**

After the cable has been inserted into the connector properly, you will use the compression coax crimp tool to compress the connection.

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Complete the following steps to complete the coax connection:

1. Insert the coax connector into the Locator making sure the copper conductor is inserted into the Locator, Figure 5-9.

2. Hold the cable in place with one hand and squeeze the handle of the compression tool with the other. Compress connection until the handles reaches bottom.
3. Remove the cable from the compression tool.
   Your coax connector is now compressed. The space between the green band and the threaded portions of the connector should be touching. If not, you have a bad connection and will need to cut the connector off and start over.

Testing Coax Cable

Coax cable is very reliable. If the connectors are installed correctly, you will seldom have a problem.

Test the copper conductor by placing a clip or probe at each end of the conductor. If the copper conductor is broken, there will be no reading on the dial.

Test the ground by placing clips or probes on the shielded portion of the cable. If there is no movement on the dial, there is a broken connection.

You can also plug the cable into video connections. If the signal is transported, you know it works.

Note: It is a good idea to test the cable while still on the spool to ensure that you have a good spool, with no breaks in it. It is much easier to test a thousand feet of cable while it is spooled than to run it and then discover that it was a bad spool after it is in the wall.

You will also need to test the individual cable segments after you have run them, to be sure no breakage occurred while the cable was being pulled.

Summary

In this section, you have learned the following:

- Which grade of cable FutureSmart recommends for its installation
- Which tools are used for building coax cable
- How to test coax cable for continuity

In the next section you will learn how to terminate fiber optic cable segments.