

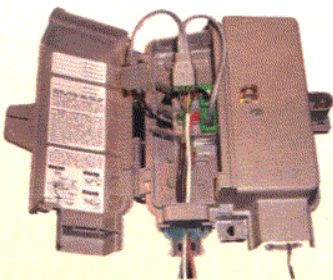
Becoming a Better Telephone Circuit Terminator

OK gang, it's time we take a close look at one of the most talked-about and often least-understood technical security topics

—the RJ-31X jack. I know, some of you are saying, "Please, not again!" Well for those who believe they know this subject inside and out, bear with the rest of us and consider this a good review. As always, I have included some material that will hopefully be of interest to all experience levels.

An alarm technician is often designated as the referee and guardian of an alarm systems telephone communication connections. On one hand, he or she is in charge of making sure that the phone company makes the correct line seizure connections. On the other hand, the technician must make sure that the customer understands what an RJ-31X jack is for, and what to do in case of phone trouble. However, many technicians make a third and dangerous choice of just hooking up the panel without the proper termination equipment and not telling anyone.

Diagram 1: The Alarm/ Telecom Connection



Optimally, the RJ-31X should be installed next to the alarm control panel. Installers must ensure the system is capable of line seizure as well as make sure the customer understands what an RJ-31X jack is for, and what to do in case of phone trouble.

Many regional phone companies have tariffs dictating how these devices are to be ordered and installed. The information here is designed to give some formal guidelines to help alarm technicians accomplish a more professional telecom installation.

Reviewing RJ-31X Jack Basics

The RJ-31X connector is specifically designed to allow a non-technical person, such as a customer, the capability to remove the alarm panel phone circuit from his or her home telephone line. The dealer must make sure that the customer understands how to disconnect the alarm panel from their house phones by unplugging the RJ-31X connector.

I recall a \$4 million lawsuit in which a defective alarm panel interfered with an emergency medical call. It was proven in court that the customer was not shown how to disconnect the alarm panel with the RJ-31X jack and regain control of the phone line. So, the customer suffered medical damages and won the case.

For an alarm panel to be FCC-approved, it must indicate in the manufacturer's user's manual directions for proper use of the RJ-31X. A good technician will point this out to the customer.

Install the RJ-31X next to the alarm control panel. For additional security, an alternate location might be inside the alarm panel ONLY if the customer has been given a key and access to the alarm panel and the RJ-31X connector.

The first rule of working with phone connections and cabling is that a technician cannot be colorblind. You may laugh, but that can actually be an issue. (NOTE: The terminal positioning and color coding of RJ-31X connectors and cords may vary with some manufacturers.) On a more serious



Bob Dolph has served in various technical management and advisory positions in the security industry for 25 years. Bob currently is a training and products consultant for the security industry. He lives in Orlando, Fla.

BOB'S TIPS

- Install the RJ-31X connector next to the alarm panel.
- RJ-31X colors and terminal positions vary by manufacturer.
- Explain RJ-31X use and document for customer.
- Supervise the RJ-31X plug connection at the alarm panel.

note, let us examine proper RJ-31X termination and installation.

Looking at the right side of Diagram 1 (left), the inside phone circuit starts with the incoming pair of T. tip (green) and R. ring (red) wires. The circuit continues through terminals 4 and 5 on the RJ-31X block, through the RJ-31X cord, and to the outside line connection on the alarm panel.

An internal double-pole single-throw (DPST) relay in the alarm control completes the circuit back. first to the RJ-31X TI (brown) and RI (gray) and then out on RJ-31X terminals land 8 with T1 (black) and R1 (yellow) wires, respectfully. Notice that RJ-31X wire colors may not match phone quad wire colors.

One of the dangers of using an RJ-31X block is that the owner or telephone technician can unplug the RJ-31X connector and leave it out. This would permanently remove alarm communications from the panel, not allowing it to report an alarm.

The RJ-31X 8-pin connector is designed so that terminals 5 and 8 are shorted out when the RJ-31X cable plug is removed. The same goes for terminals 1 and 4. This shorting action electrically removes the alarm panel phone connection and reconnects all of

Tech Talk

With Bob Dolph

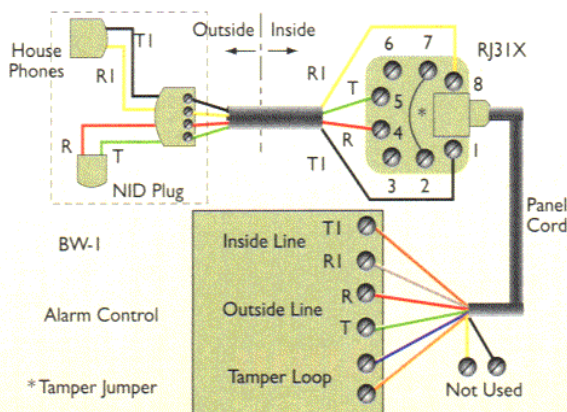
the house phones.

One method used to supervise the removal of the RJ-31X plug is using the built-in tamper connection. By placing a jumper across terminals 2 and 7, and connecting the blue and orange wires to a normally closed 24-hour audible tamper circuit, the customer will be aware when the plug has been removed. An installation time-saving alternative to the RJ-31X is using the RJ-38X module, which has

alarm panel; however, the alarm phone connection has been removed.

Philadelphia-based Better Way Products (www.bwconnector.com) has designed a modular device that helps reduce the problems mentioned above. Looking at BW-1 on the left side of Diagram 1, you will notice a device that consists of a 4-terminal connector and two plugs. This device is designed to neatly fit into the NID boxes in which all home phone lines feed through a RJ-

Diagram 2: Modular Connector Installed Inside a NID



The BW-1, a modular connection device from Better Way Products, is designed to fit neatly into the network interface device (NID) boxes in which all home phone lines feed through a RJ-11 type plug.

fewer terminals since the 2-7 jumper is built in to the module.

Making Life Easier on the Outside

In order to properly connect a RJ-31X block, a 4-conductor "quad" cable must be run from inside the alarm panel to the outside phone company demarcation point. The device at the demarcation point is often referred to as the network interface device (NID). The quad cable must be connected in such a way as to reroute the telephone connection, vial and R, to the alarm panel, and then via T1 and R1 back to the house phone that is connected to the NID.

A common problem is that a phone technician may not understand this NID connection and just cut or remove the alarm panel connections. Since the RJ31X is still physically plugged in, a tamper will not be reported to the

11 type plug (see Diagram 2 above).

The BW-1 device installs in just a few minutes by connecting the four alarm system wires to the screw-in connectors; removing the existing home phone plug from the NID and plugging it into the BW-1 connector; and taking the male BW-1 plug and plugging it into the NID outside line connector.

Red Is Positive, NOT!

Here's a final tip for this month. The on-hook line voltage (talk battery) on ring (red) with reference to tip (green) is -48VDC, and 5VDC for off-hook. A typical ring voltage is 85VAC-105 VAC. The AC current drain is 20 ma-50 ma. Warning: It will give you a nasty shock, especially if your skin is sweaty.