Changes to CPC Echelon Network Policy

Based on tests and field studies of existing CPC installations, CPC has revised its Echelon network installation instructions. These new instructions outline a method of network structuring that will result in the most error-free Echelon network possible.

The most significant changes to the Echelon network policy are:

- CPC no longer supports five different cable types for use as Echelon network cable. Only one wire type—shielded Level IV— is allowed.
- CPC recommends the 'daisy-chain' method of network structuring as the most error-free method. 'Branched configuration' or 'free topology' is no longer recommended.

The instructions given in this technical bulletin override all other network installation instructions in all CPC documentation published before the date of this technical bulletin's release. These instructions will be incorporated into all future versions of Echelon-related technical literature.

Note: This technical bulletin does not call for any changes to be made to existing sites with properly functioning Echelon networks. These instructions should be followed for all new installations and retrofits.

Approved Echelon Cable Types

Previously, CPC specified five different cable types for use with Echelon networks. Of these cable types, the only one appropriate for use in refrigeration/HVAC environments is **shielded, stranded, twisted pair, 22 AWG Level IV cable**. CPC does not support the use of any other kind of Echelon cable for use with Einstein networks.

Avaliability

Some previously published CPC documentation said the Belden equivalent for this cable is Belden #8795, but this is incorrect. There is no Belden equivalent for shielded, stranded, twisted pair 22AWG Level IV.

The correct cable type is available from CPC (non-plenum, P/N 135-2300; plenum, P/N 135-2301) or from ConnectAir (non-plenum P/N W221P-1003, plenum P/N W221P-2002). Contact your CPC sales associate for vendor information.

Echelon Network Structuring (Daisy-Chain)

In previous versions of Einstein and other Echelon-related documentation, CPC supported several methods of configuring a network. These have included: daisy-chain configuration, "branched" configuration, and free topology (or "star configuration").

For best results, CPC now recommends using daisy-chain configuration for all Echelon network applications. Daisy-chain configuration provides the greatest protection against signal noise and interference, and has proven to be the best configuration to use for networking Einsteins and their peripherals.

The instructions below explain how a daisy-chain Echelon network is configured. These instructions will be incorporated into new versions of the Einstein RX User's Guide (026-1601 Rev 2) and Einstein BX User's Guide (026-1602 Rev 2). Refer to these manuals for more detailed information about Echelon wiring.

Echelon Network Structuring (Daisy-Chaining)

Echelon devices are networked together into configurations called **segments.** A segment is a group of up to 64 Echelon devices that are connected together on an unbroken series of wires.

The recommended way of constructing an Echelon network is called **daisy-chaining.** In the daisy-chain network configuration, devices are arranged by **subnets**, which consist of one Einstein and all Echelon devices associated with the Einstein.

First, all devices in a subnet are connected in an unbroken chain without branches or "star configurations" (see *Figure 1*). Then, if more than one Einstein is present on site, all chains are connected so that the entire network forms a large unbroken chain, called a daisy chain (see *Figure 2*). This allows for all devices in the Echelon network to be wired together for trouble free communication.

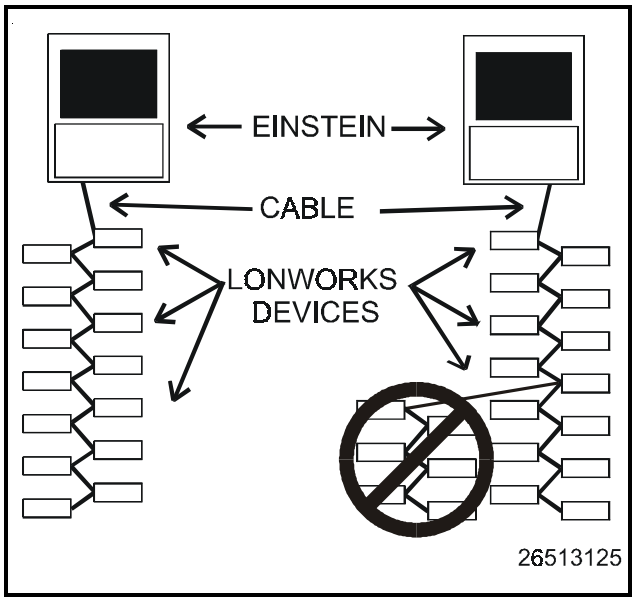

Figure 1 - Echelon Wiring - Subnets

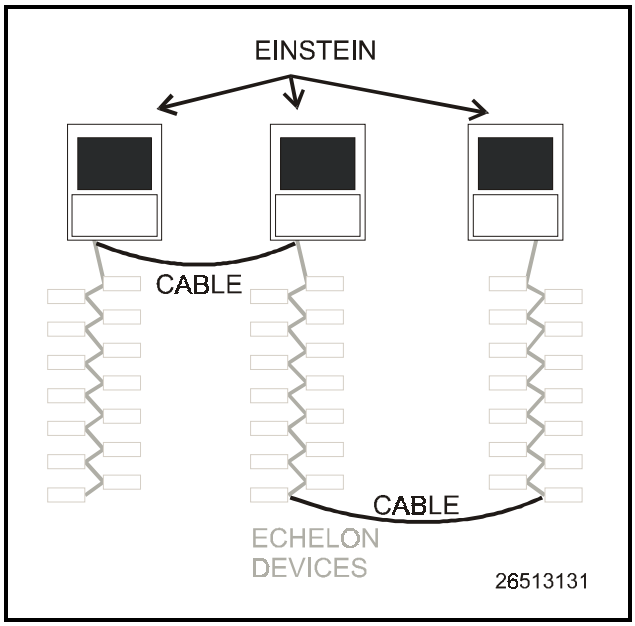

Figure 2 - Echelon Network Segment, pt. 2

Maximum Number of Nodes

A daisy-chained segment may contain no more than 63 total Echelon devices (also called "**nodes**"). If there are 64 or more Echelon devices at your site, an Echelon-compatible router (*P/N 572-4200)* will be required. A router placed on the Echelon network allows you to add another 63-node daisy-chain segment. For larger installations, multiple routers can be used to extend the network indefinitely.

More information about routers and how they are used in a daisy-chain Echelon network can be found in *P/N 026-1605, Router and Repeater Installation Guide.*

Device Termination

In a daisy-chain configuration, both ends of the network segment must be terminated. Terminate the Einstein by setting jumpers J16 to the DOWN position and J17 to the UP position, as shown in *Figure 3*. Other devices on the Echelon network are terminated either by jumpers on the control board or by connecting a 102-ohm "terminator block"at the end of the network segment (See "Using a Termination Block (P/N 535-2715) to Terminate a Daisy Chain" on page4.). Refer to the installation guide references at the end of this section for specific device termination instructions.

All other Einsteins and Echelon devices that aren't at the end of a daisy-chained network segment must be unterminated.

If a router or repeater is being used in a network, termination becomes more complicated. Refer to *P/N 026-1605, Router and Repeater Installation Guide,* for more information about termination in networks with routers and repeaters.

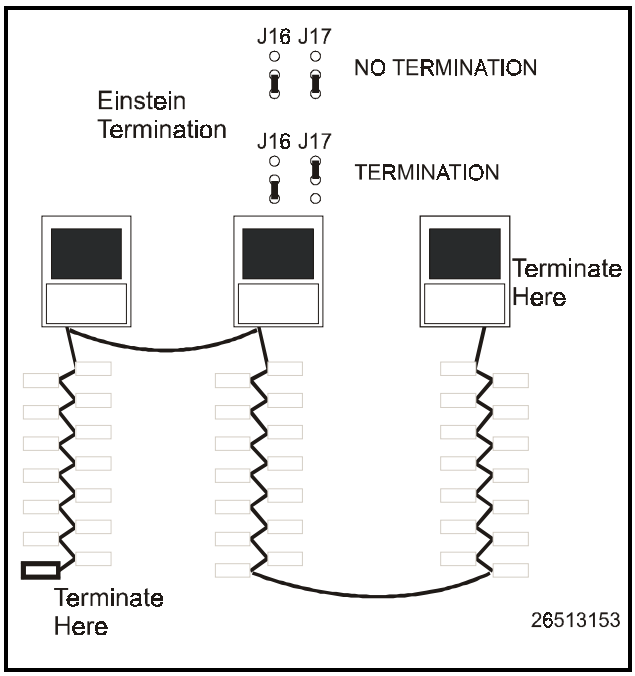

Figure 3 - Einstein Termination - Daisy Chain

Using a Termination Block (P/N 535-2715) to Terminate a Daisy Chain

Some Echelon network devices, notably ESR8s and TD3s, have no on-board means of terminating. For some other devices, it is inconvenient to use the jumpers supplied for termination (the CC-100/CS-100 case controllers, for example, require the enclosure to be removed to set the jumper).

To remedy these problems, CPC supplies termination blocks that can be wired to the end of an Echelon cable segment. This termination block uses the same three-pin connector as all other Echelon devices. Wire the two signal wires to the outside terminals, and connect the shield to the middle terminal (see *Figure 4*).

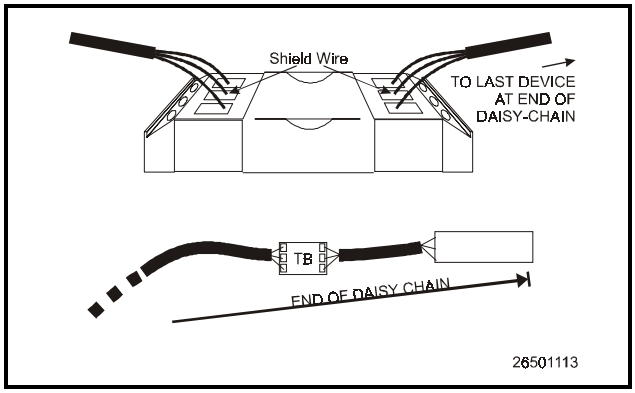

Figure 4 - Placement and Wiring of the Termination Block

Wire Restrictions

Maximum Total Segment Length

The total amount of wire used to connect all Einsteins and associated controllers in a single segment (not including devices on the other side of routers or repeaters) cannot be longer than 4592 feet (1400 meters). If the total length of cable used is longer than 4592 feet, a repeater or router will be required.

Routers act as communication gateways that reduce the amount of network traffic. They are used when networks exceed their 63-node limit. Adding a router allows you to add another daisy-chain segment of 4592 feet with a maximum of 63 more nodes.

Repeaters boost signal strength and are only used in instances where a segment of 63 nodes or less uses more than 4592 feet of Echelon cable. Adding a repeater allows you to add another daisy-chain segment of 4592 feet. Unlike the router, however, the repeater does not allow you to add any extra nodes.

Refer to *P/N 026-1605, Router and Repeater Installation Guide*, for information about router and repeater placement.