

★ ★ CORVUS SYSTEMS  
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# INSTALLATION GUIDE

Corvus OMNINET™  
Active Junction Box™



## Introduction

Corvus OMNINET™ is a common bus topology local network which allows up to 64 devices to be interconnected. The OMNINET common bus is a cable composed of a pair of 20-gauge insulated conductor twisted together inside a common insulated cover. This twisted pair wire common bus is referred to as the network trunk.

An OMNINET local network is composed of one or more trunk segments, with any single segment extending up to 1800 feet in length. When multiple segments are used, active junction boxes are required to join the network segments. Two network devices can communicate as long as they are no further than 4000 feet apart.

To attach a device to OMNINET, the device must have an OMNINET network interface. In the case of a microcomputer, a transporter™ card for the specific microcomputer (such as an Apple II™) is used. A network server is used to attach a shared peripheral to OMNINET. A network server has both an OMNINET interface and an interface to the shared device such as a disk or a printer.

Each OMNINET network device has a Molex™ connector to attach the device to a twisted pair. This twisted pair wire is called a tap cable and connects to an OMNINET network tap. An OMNINET network tap is a passive junction box connected to the network trunk.

# The Active Junction Box

The Active Junction Box is a signal booster which allows network devices to communicate over extended distances within the network.

Active Junction Boxes must be installed when the total length of the network exceeds 1800 feet or when it is desirable to make a T or branch connection to the original network trunk wire. A T connection can be made at any convenient location to expand the network into new offices as needed.

Figure 1 shows a local Corvus OMNINET network and the locations of the Active Junction Boxes.

## Definitions

- Network Trunk** — OMNINET common bus used to interconnect devices. (Twisted pair wire 4000 feet maximum length.)
- Network Segment** — a length of trunk wire between any two Active Junction Boxes or between an Active Junction Box and a terminator.
- Active Junction Box** — a signal booster which joins two or three network segments, allowing network devices to communicate over extended distances.
- Network Tap** — Passive Junction Box™ used to connect network devices. (A maximum of 64 network taps are allowed.)
- Tap Cable** — twisted pair wire used to connect network device to network tap (15 feet maximum length).
- Network Device** — device containing an OMNINET network interface. (OMNINET transporter card or network server.)

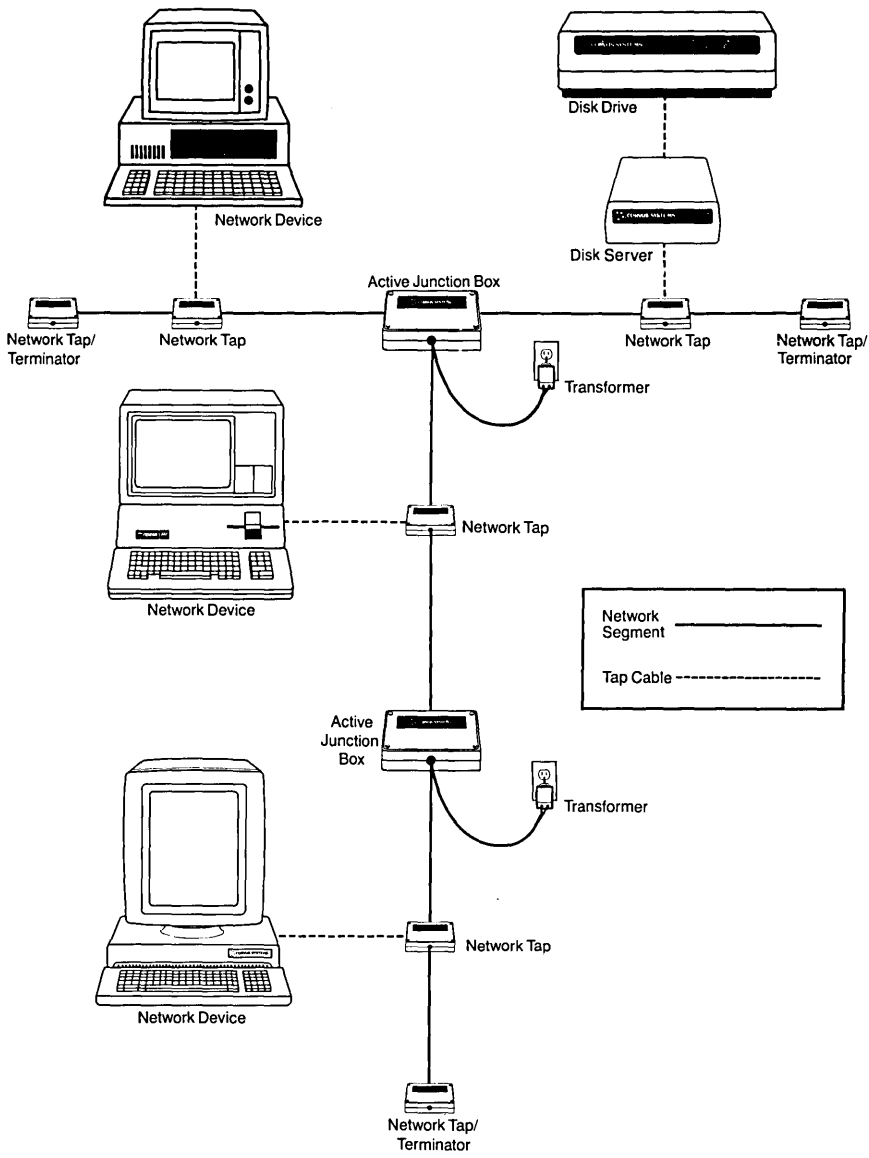


Figure 1: Corvus OMNINET Network Using Active Junction Boxes

# Components

Figure 2 shows the two main components of the Active Junction Box. These are the transformer, which can be plugged into any standard 120 volt grounded outlet, and a molded plastic box, which contains electronic circuits and connectors.

There are eight screw-down connectors at the base of the printed circuit board used to connect segment trunk wires. There are three sets of connectors. Each segment has access to a connector set labeled +, -, and Drain.

There are two screw-down connectors at the top of the printed circuit board used to connect the two wires coming from the transformer.

The red L.E.D. located on the printed circuit board indicates when power is applied to the Active Junction Box.

NOTE: Electrical power coming from the transformer is low voltage direct current and presents no danger.

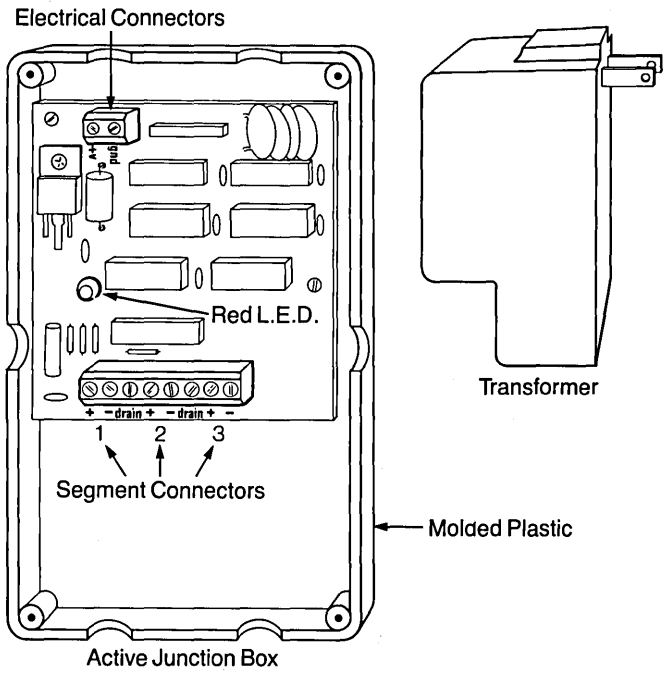


Figure 2: The Active Junction Box and Power Transformer

## Placing the Active Junction Box

A simple method for determining the placement for each Active Junction Box has been developed by Corvus Systems. Each segment of the network is assigned a certain numeric value, called an Omninet Unit™. The Omninet Unit Value is related to the length of each segment and the wire type used. These values are shown in the table in Figure 3.

The table in Figure 3 should be used to assign Omninet Unit Values to each network segment according to its length and wire type. A network segment length is defined as the length of trunk wire between any two Active Junction Boxes or between an Active Junction Box and a terminator.

The total number of Omninet Units allowed between any two devices on the network is 100.

Add all the Omninet Unit Values and make sure that the sum of these values does not exceed 100.

**Omninet Unit Value Table**

Network Segment Length	Omninet Unit Value	
	Alpha™ 1895	Beldon™ 8205
100 to 250 feet	17.5	12.6
250 to 500 feet	19.0	13.7
500 to 750 feet	29.0	21.0
750 to 1000 feet	40.0	29.0
1000 to 1500 feet	100.0	72.0
1500 to 1800 feet	N/A	100.0

Figure 3: Omninet Unit Value Table

# Connecting Two Network Segments

The following instructions describe how to connect two network segments using an Active Junction Box.

1. Open the Active Junction Box by removing the screws at the four corners.
2. Strip all four wire leads on the two segments to be joined.
3. Insert the red wire from one segment into the + connector of set 1 and tighten down the screw.
4. Insert the black wire from the same segment into the - connector of set 1 and tighten down the screw.
5. Now take the second segment and insert the red wire from this segment into the + connector in set 3.
6. Insert the black wire from the second segment into the - connector in set 3.
7. If your segment wires are shielded, insert the shield drain wire into either of the connectors labeled Drain and tighten down the screw.

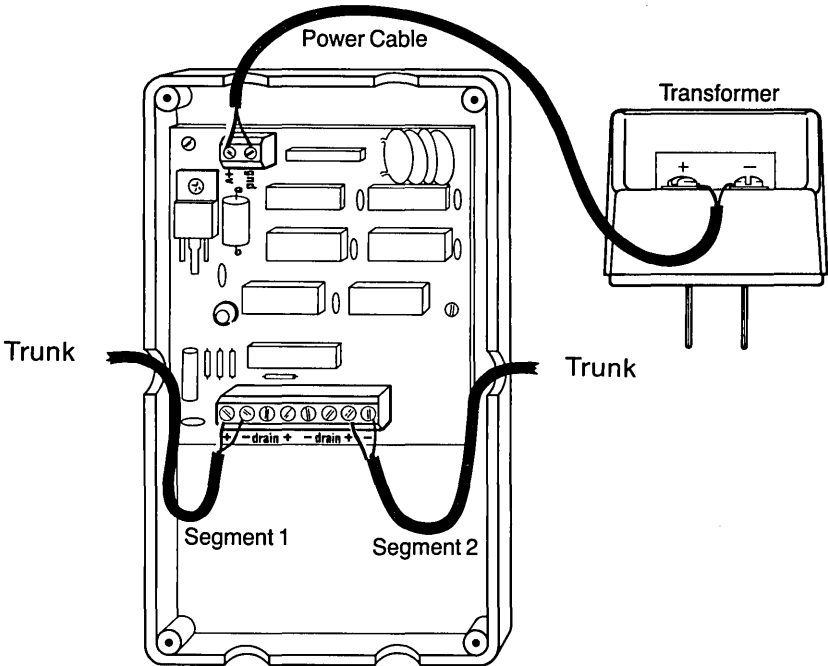


Figure 4: Connecting Two Network Segments

## **Connecting A Power Cable To The Printed Circuit Board**

To provide power to the Active Junction Box's printed circuit board from the transformer supplied, first determine how long a power cable you will need to run power from the closest power outlet to the Active Junction Box. This power cable should be a twisted pair wire. (Cables of up to 100 feet are supported using the 20 gauge trunk cable.)

1. Cut the power cable to the desired length.
2. Strip all four wire leads.
3. Insert red wire into terminal labeled +V on the Active Junction Box printed circuit board. Tighten down the screw.
4. Insert black wire into terminal labeled GND on the Active Junction Box printed circuit board. Tighten down the screw.
5. Connect the other end of the red power cable wire to terminal labeled + on the transformer.
6. Connect the other end of the black power cable wire to terminal labeled - on the transformer.

## **Verifying Power Connections**

1. With the cover of the Active Junction Box off, plug the transformer into a 120 volt, 60 Hz wall outlet.
2. The L.E.D. on the Active Junction Box should light up as soon as you plug in the transformer. If the L.E.D. does not light up, unplug the transformer from the wall outlet and recheck the power cable connections. (Steps 3 to 6 above.)
3. If the L.E.D. came on in step 2 above, then unplug the transformer and continue installation of the next trunk segment.

Close the Active Junction Box after you have completed the entire installation procedure (tested all Active Junction Boxes, installed taps and terminators), plug all transformers into wall outlets.

**NOTE:** Every end of the network trunk must be Terminated using resistors supplied by Corvus. (See Corvus OMNINET Installation Guide.)



# Creating A Network T

The following procedure describes how a network T can be created using an Active Junction Box. Figure 5 shows the wiring diagram for a third segment connection. Follow all the steps in the previous section entitled *Connecting Two Network Segments*, and then connect the third segment by going through the following steps.

1. Disconnect the transformer connected to the Active Junction Box from the wall outlet.
2. Strip both wire leads of the third segment trunk cable.
3. Insert the red wire lead into connector set 2 labeled + and tighten down the screw.
4. Insert black wire lead into connector set 2 labeled - and tighten down the screw.
5. If shielded twisted pair wire is used, insert the shield Drain wire into either Drain connector and tighten down the screw.
6. Plug the transformer into the wall outlet.

NOTE: Every end of the network trunk must be terminated using resistors supplied by Corvus. (See Corvus OMNINET Installation Guide.)

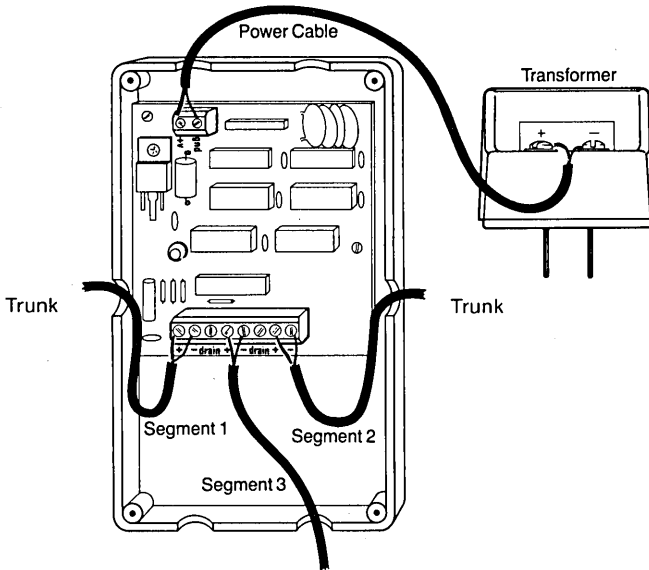


Figure 5: Creating A Network T