

## Staks electrical and wire management planning

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## Table of contents

Basic electrical terms	3
Amp budgeting/UL codes	4
Planning for Staks/OFS notes	5
Power block/duplex placement	6
Jumper planning	7
Jumper management	8
Infeed planning	9
Infeed/data management	10
Data	11
Wiring diagrams	12
2 circuit / 4 wire power	13
3 circuit / 5 wire power	14
4 circuit / 8 wire power	15
Chicago/NYC code/Title 24	16

## Basic terms used when dealing with and selling electrical

### **Amps:**

Unit of electrical measurement commonly used to rate power requirements of the equipment. For example, your laptop requires 3.36 Amps. Typical commercial electrical wall outlets are wired for 20 Amp service. Older buildings may have the older standard/ residential 15 Amp service.

### **Circuit:**

Individual circuits feed off the main service to the building, carrying electrical power through the circuits to each room. A commercial circuit is typically rated at 15 to 20 Amps each, depending on the application or need.

### **Hard wire:**

Electrical connection of power feed supplying furniture and equipment to building power source. Requires a certified electrician to install a hardwire connection. Usually hardwire connections are used for multiple circuit access from the power source.

### **Wire manager:**

Wire manager is a generic term used to describe organization of electrical, voice and data cables in furniture.

### **Power block:**

Duplex unit which holds the modular circuit receptacles.

### **Underwriters laboratory - UL:**

The mother of all electrical standards-see special section on Byrne UL 183, Dekko UL 962 for specifics.

### **Jumper:**

Modular link connecting power blocks/duplexes between furniture. Sometimes referred to as daisy chaining.

### **Hot, neutral and ground:**

Terms used to describe the different types of wires used in electrical schematics.

- **Hot:** Each circuit requires a hot wire to carry the electrical power. Hot circuits can be shared or isolated.
- **Neutrals:** The neutral is also required to complete the circuit. It is the return portion of the circuit and carries the electrical power back to the ground in effect completing the circuit.
- **Grounds:** This wire is a safety net in the event a hot or neutral fails. It creates a safe path back to the ground versus sending the energy through the utility (e.g. computer).

### **Modular connection:**

Another term used in placing of jumpers.

### **Power strip:**

Power plug rated at 15 amps. Allow user to plug several pieces of equipment into one power tap. (Note it is not kosher by NEC standards to daisy chain power strips.)

### **Category 3:**

Commonly used in phone equipment. Lowest rating in terms of speed of transmission of communication and therefore is not used in high-speed modem communication. Typically CAT-3 is a modular connection system.

### **Category 5:**

High-speed communication, usually hard wired to allow maximum communication speed. CAT 5's has a rating of 100 megabytes of information transfer per second.

## Amp budgeting

The standard equipment found in workstations or cubicle in Corporate America consist of a Computer, Laptop, CPU Monitor, Clock Radio, Cell phone, Battery Charger, iPod, iPad, task light, calculator, and lamp. Below is a list of common items or equipment used in the modern day open plan or private office/conference rooms. These items are shown with the amount of AMPS required.

Laptop Computer/CPU (depends on size): 2-4 Amps  
 Fax: 1 Amp  
 Monitor: 2-2.5 Amps  
 Focus Machine: 3-5 Amps  
 Printer-DeskJet: 4 Amps  
 Overhead Projector: 1.5-3 Amps  
 Printer-LaserJet: 6.5 Amps

## UL underwriters laboratory codes

There are three main standards that UL has established and apply to power distribution for the office: (Byrne) UL 183 and (Dekko) UL 962. UL 183: UL 183 standards were developed for modular components used on equipment and in our case tables. UL 183 category can be hardwired, single or multi circuit, single or three phase designs. The standard requires that the electrical system comply with UL standards, but it has no bearing on the furniture. Thus, while the electrical system is considered in compliance, it is up to the furniture manufacture to secure the electric to its product in a safe manner

## Planning for Staks

This planning section will help you understand how to help your clients with the correct power requirements. In most cases it comes down to asking these simple questions and then making the right recommendations.

1. What will each user be using in the office or open plan?
2. Are we dealing with new construction or existing building specs?
3. Where is the power in the room? Is it flexible-under floor access?
4. Will we need surface power access?
5. How will data be handled? Surface mounted or underneath the surface?
6. Are there any particular local codes or constraints to deal with, such as in NY or Chicago.
7. Is a dedicated circuit required?

The typical project will include a spec from an architect or designers drawing. These drawings will have several rectangles positioned in a creative configuration. Such creative expression often does not lend itself well to reality. That is where you come into the picture.

1. Sell standard product if you can. Sometimes customizing product or changing electric circuits will cause the table not to meet UL codes or BIFMA Standards. Understand the UL Codes we work with in.
2. Over Power the work surface: ask the questions from above. Count the number of computers in each open plan and multiply by the Amps required for each computer. This will tell you how much power the row will require. The NEC has certain rules facilities must abide by. Computers in use for more than 3 hours must down load the capacity of the power supply by 20%. Therefore an eighty Amp hardwire power feed would only be rated at Sixty four amps.

OFS recommends 5 Amps of power per workstation

- 3 workstations per circuit is the general rule
- 6 workstations per 4-wire infeed (based on 5 Amps per workstation)
- 9 workstations per 5-wire infeed (based on 5 Amps per workstation)
- 12 workstations per 8-wire infeed (based on 5 Amps per workstation)

## Notes

Since our focus is on open plan and private office, we will move forward to the present and the explosion of technology and current trends and their uses. Their uses include training, teaming, conference, and education. Staks is expected to assist technology, communication and the movement of data. Incorporating power and data into the products we sell has been accomplished. All we need to do is understand it and be able to explain our power and data systems to our customers. Please review the following pages that give examples of how to run power, data, and wire management

## Power block/duplex placement

### General

- Power duplexes mount to the underside of the worksurface using a power box, and a power box bracket.
- **Note:** Place duplexes and power blocks in consistent location for each user to maintain consistent jumper lengths.

### Static worksurface power placement

- Recommended location would be along the spine wall, where the two surface seams connect. duplex can be placed on either the main or return worksurface. This location is typically most accessible to the user.
- If not placing at surface edge depth, as shown in below images, additional jumper length may be needed.



Static worksurfaces  
power shown on main worksurface



Static worksurfaces  
power shown on return worksurface

### Height adjustable worksurface power placement

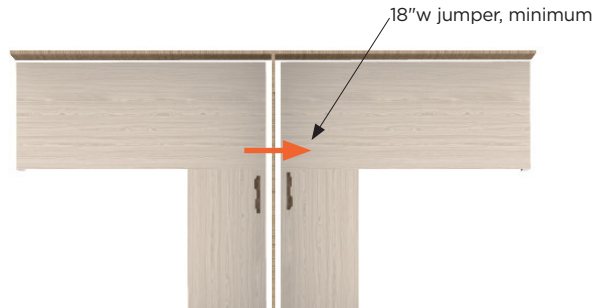
- Recommended location would be on return surface, close to height adjustable table seam.
- **Note:** Do not install power boxes on height adjustable worksurfaces. Raising the worksurface will over extend the jumpers and cause damage to power items.



## Jumper planning

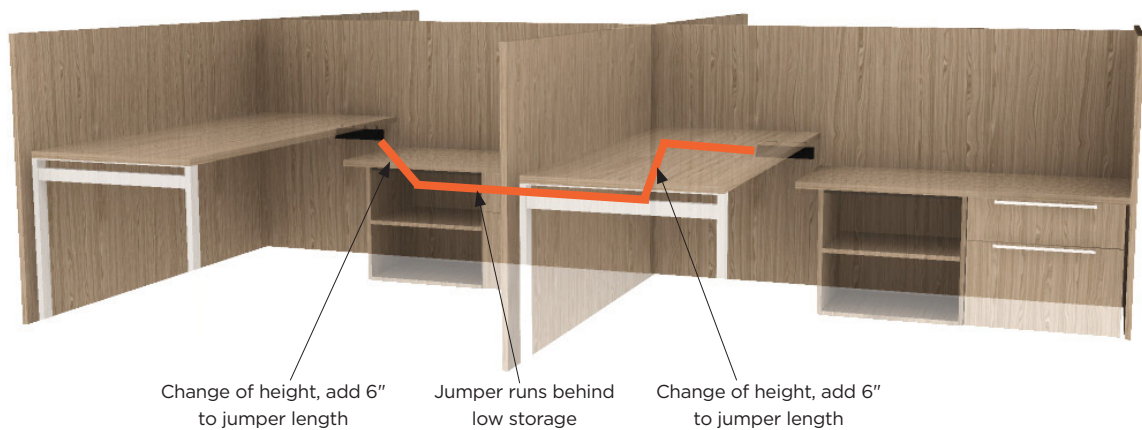
### General

- To maintain consistent jumper lengths, place power blocks in same location for all users.
- When using a jumper to connect back to back power blocks divided by a spine wall, connecting jumper should be a minimum of 18" w.



### Desk to low height

- When powering duplexes between desk to low height applications, a minimum of 6" must be added to the jumper length for each change of height.



## Jumper management

- **Note:** Jumpers will run through panel walls by adding field cut grommet holes. GSCGB-1 grommet cover available
- Jumpers can be secured in a variety of ways to suit the end users needs. At minimum, jumpers can rest on cantilevers and pedestal support brackets, though you may desire additional wire management items for aesthetic purposes

### Wire baskets

- Jumpers can rest in baskets, or be attached to the exterior of the basket using Velcro strips



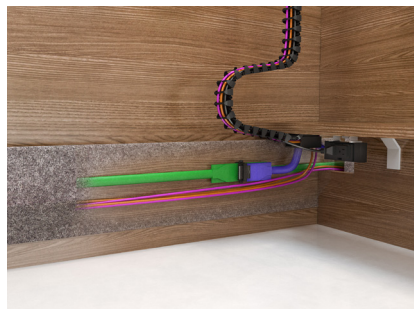
### Cable clamps

- While OFS does not supply this item, a cable clamp can be used to manage cables. This would attach the jumper directly to the bottom of the surface. **Note:** Additional jumper length may be needed if jumpers are not run in a straight line. Order cable clamp diameter size based on diameter of jumper and/or cables combined



### PET wire manager

- PET trays are typically used for undersurface wire management, but they can also be mounted to the panel to manage power and data cables along the spine wall. Doing so allows you to completely conceal the jumper and data cables. **Note:** Additional jumper length may be needed
- Typically used along spine walls to cover jumpers along the panel that could be visible when a height adjustable table is in the raised position.

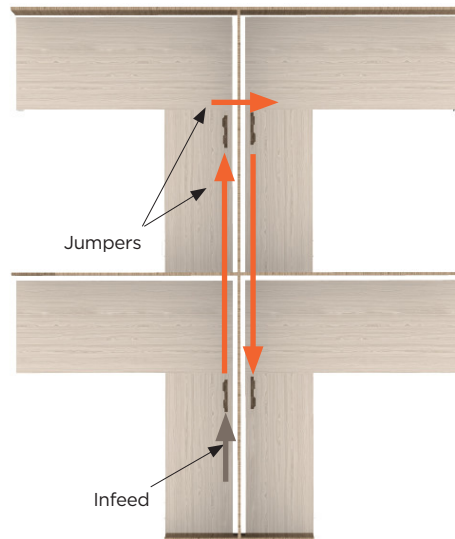




## Infeed planning

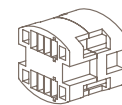
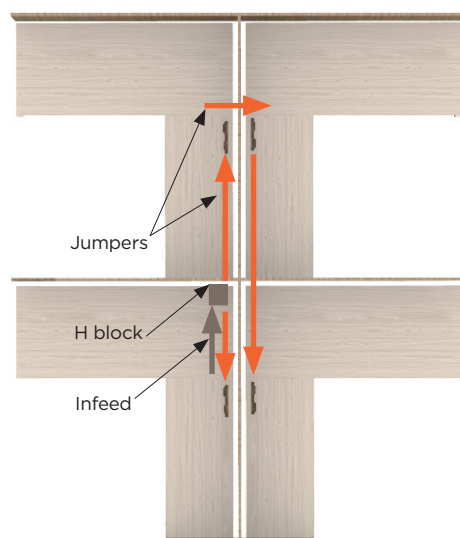
### End of run

- When power starts at the end of a run, the most direct way to run power is in horseshoe type layout as indicated by the arrows in the below image
- The infeed will attach to the end power box, and the jumpers will carry on in a straight line, crossing to the other side of the station through the spine panel, and then continue back down the typical

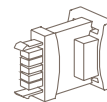


### Middle of run

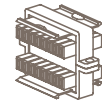
- When power starts at the middle of a run, from a floor core inside of the station, it is best to utilize an H block or Y block, and run the power jumpers to the power blocks as indicated by the arrows. **Note:** YCB5 connects directly to the power block
- When using an H block, the infeed will connect to one of the four connection points on the H block. A shorter jumper will connect the H block to the closest power block. A second jumper will connect the H block to the power block at the top of the station. From there, you will cross over to the next power box, and then connect the two power boxes with a longer jumper
- **Note:** Wire baskets or cable clamp should be used to help the jumper and power infeed attach cleanly under the worksurface



HCB - 2 circuit/4 wire



YCB5 - 3 circuit/5 wire



HCB2 - 4 circuit/8 wire

## Infeed/data management

### Floor core under pedestal

- When a floor core is located where a storage pedestal is to be placed, it is recommended to specify a low height pedestal on the 3.5" h metal legs. Extra infeed length can be coiled under the pedestal. **Note:** A 90° connector is recommended to be installed by the electrician when connecting the infeed to the floor core in this application

### Floor core in middle of station

- When a floor core is located inside of the station where it will be viewed, a vertical wire manager is recommended to be used to cover the infeed and data cords that will run vertically from the floor core



Floor core under pedestal



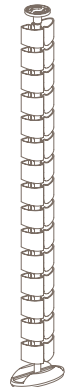
Floor core in middle of station

### Vertical wire managers

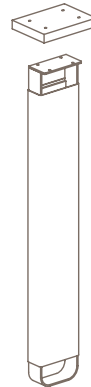
- The following vertical wire managers can be used to conceal infeed and data cords that are visible inside of the station
  - WM-HA6: Fabric wire manager that secures around cords with Velcro strip
  - CMV-AL: Vertebra wire manager will only house data wires and small cords, infeed would need to be secured to the exterior of this wire manager
  - VCWM4 used for medium cabling
  - VCWM5 used for heavy duty cabling
- WM-HA6 can be cut in field if needed. CMV-AL, VCWM4 and VCWM5 connect to underside of worksurface



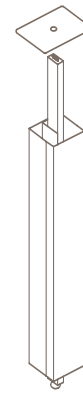
WM-HA6



CMV-AL



VCWM4



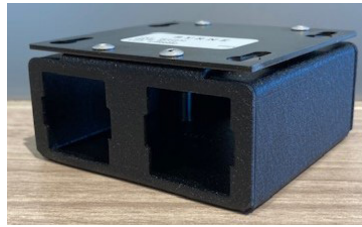
VCWM5

## Data

- Staks offers a data box (DM1) that comes with a variety of openings to accommodate a variety of inserts
- As standard, we offer voice (RJ-5) and data (RJ-45) modules to work with these units. RJ-5 and RJ-45 would use FFF Insert
- Additional modules would be supplied by the specifier or end user
- This data box can be placed anywhere under a surface. We also offer modular desktop power units that can accommodate data ports
- As an alternative option, the end user may wish to supply their own data items. Because of the flexibility of Staks, they would also be able to place their own units anywhere along the underside of a Staks surface



DM1 top view



DM1 front view



DM1 back view



BBB

EEE

DDD

CCC

FFF

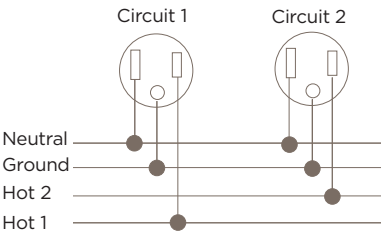
HHH

## Wiring diagrams

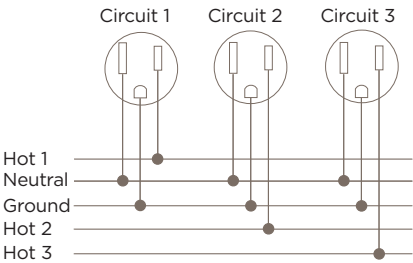
**2 circuit / 4 wire power**  
20 Amp outlets (Circuit 1 and 2 only)

**3 circuit / 5 wire power**  
20 Amp outlets (Circuit 1, 2, and 3 only)

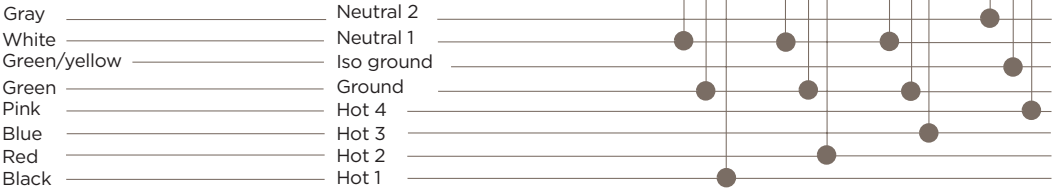
**4 circuit / 8 wire power**  
15 Amp outlets (Circuit 1, 2, 3, and 4. Circuit 4 is isolated and dedicated)



2 circuit / 4 wire power



3 circuit / 5 wire power



4 circuit / 8 wire power

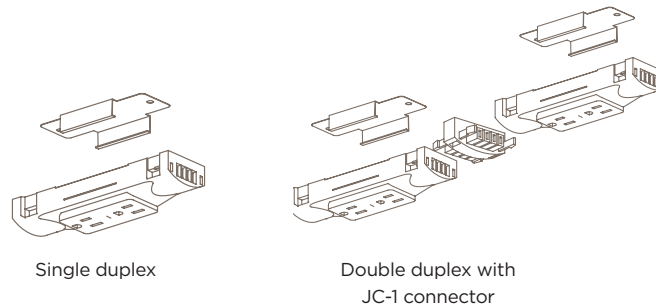
## 2 circuit / 4 wire power

### Duplexes

- There is one type of power unit used for open plan applications, a single duplex (Circuit I or Circuit II) with connection points at each end for jumper or infeed connections
- A double block can be created by connecting two duplexes with a JC-1 jumper connector

### Duplex bracket

- Duplexes are connected to the underside of the worksurface with a bracket (included)
- Duplexes sit flush to the underside of the worksurface

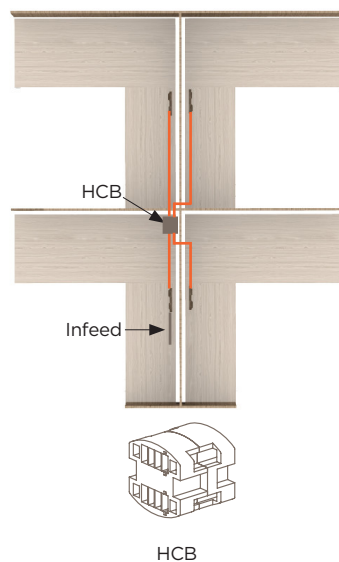


### Jumpers

- Jumpers come in lengths of: 12"w, 18"w, 24"w, 30"w, 36"w, 42"w, 48"w, 60"w, and 72"w

### Jumper connector

- A HCB block connector allows junction for up to four jumpers, or three jumpers and an infeed
- **Note:** Jumper connector should be placed evenly between power boxes, to maintain consistent jumper lengths



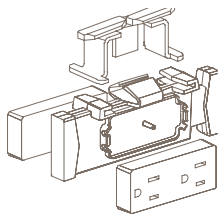
## 3 circuit / 5 wire

### Duplexes

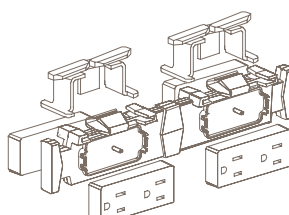
- Duplexes are 20 amp circuits, UL listed
- Available in circuits I, II, and III

### Power blocks

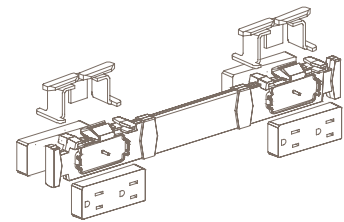
- Power block widths:
  - Single: 6"w
  - Double: 12"w
  - Extended double: 18"w, 24"w, 30"w
- When using 3 circuit / 5 wire electrical there are two types of power blocks used for open plan applications, a single and a double power block. Both blocks are double sided and the double power block comes in multiple lengths. A single power block will hold (2) duplex, a double power block will hold (4) duplexes.
- Power blocks are connected to the underside of a surface with a PBBKTA2 bracket. Duplexes then attach to the power blocks.
- **Note:** Duplex box is double sided, but does not require duplexes on both sides



Single duplex box



Double duplex box



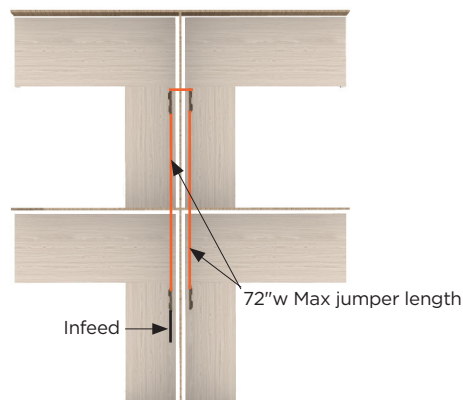
Double extended duplex box

### Jumpers

- Jumpers come in lengths of: 12"w, 18"w, 24"w, 30"w, 36"w, 42"w, 48"w, 60"w, and 72"w

### Jumper connector

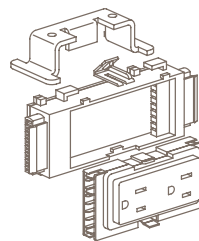
- Jumper connectors are not available for 3 circuit / 5 wire systems. If longer spans are needed, utilize the extended duplex power block, or add an additional power block



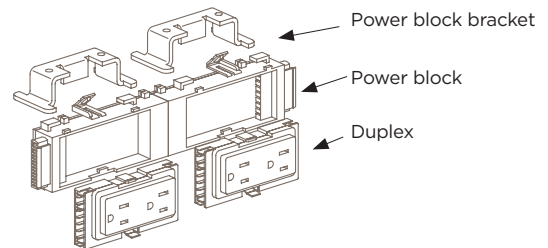
## 4 circuit / 8 wire

### Power blocks

- When using 4 circuit / 8 wire electrical, there are two types of power blocks used for open plan panel applications, a single half and a double half. A single half power block will hold (1) duplex, a double half power block will hold (2) duplexes
- Note:** There are also single and double power blocks, which are double sided, but are not to be used along panels
- Power blocks are connected to the underside of a surface with a PBBKT1 bracket. Duplexes then attach to the power block



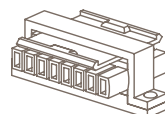
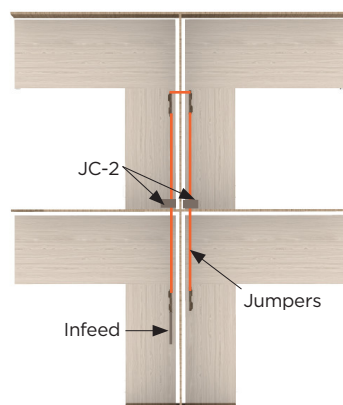
Single duplex box



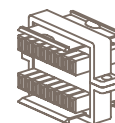
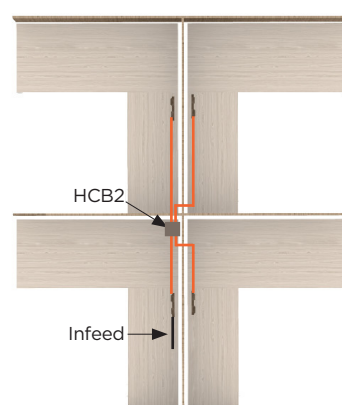
Double duplex box

### Jumpers

- Jumpers come in varying lengths from 8"w to 84"w. When a span between two power blocks is greater than 84"w, two jumpers can be connected together using a JC-2 jumper connector
- A HCB2 block connector allows junction for up to four jumpers, or three jumpers and an infeed
- Note:** Jumper connector should be placed evenly between power blocks, to maintain consistent jumper lengths



JC-2



HCB2

## Miscellaneous power

### Chicago power

- OFS does not supply power components for areas that require Chicago power code. Chicago electrics wiring restrictions that require that all wiring and connections be supplied and connected by a licensed electrician
- A PWF3M120 infeed may be used if requested by the electrician
- Electrician supplied power/junction boxes can be installed directly to Staks work panels, at any height. Recommended installation would be along the floor, or just below the worksurface

### New York City Code

- Infeeds available for all circuit systems
- Concealed power components are available under premium power

### Title 24

- DPX8WCT duplexes. Duplex available as circuit I, II, III, or IV. (Circuit IV is isolated and dedicated)