# CDF BUILDING 327 UTP Wiring

May 24, 2001 (Eugene "JJ" Schmidt, jj@fnal.gov, 630-840-4328)

## I.  General Outline

This note outlines the copper wiring requirements for networking and telephone to the desktops in CDF Building 327. Category 5e unshielded twisted pair (Cat5e UTP) cable will be pulled through conduit from patch panels in a relay rack in the electrical closet and from Telco blocks in the electrical closet to Siemon SP5-T4 "surface pack" modules (referred to as SP5's in this document). The conduit and relay racks will be in place. The conduit is buried in the building floor and terminates in a flushed mounted floor box. Each SP5 module will have 4 network cables and one telephone cable. Each conduit will have either 15 or 20 Cat5e cables terminated at the desktop end in either 3 or 4 SP5 modules respectively. This document is a request for a quote for material and labor to install, terminate, dress, and label all Cat5e UTP cables. (Note that the cables used for phone will be left unterminated at the end in the electrical closet. The phone line termination will be completed by Telco.) Figure 1 is a conceptual drawing of the network/phone wiring. Figure 2 shows a sample SP5 module.

The contractor must get a Job Hazard Analysis (JHA) from a Fermi Construction Coordinator before starting work. All work must be performed during normal working hours of 7AM to 5PM Monday through Friday. The contractor must supply sufficient laborers to complete the work in a timely manner, without assistance from Fermilab employees.

## II.  Network & Phone Installation Procedure

The following work will be required for the UTP cabling of the CDF New Building. Follow manufacturer installation guidelines for all termination boxes and components (see Table 1 for Parts List).

A.  Install five Siemon HD5-48-T4 panels in relay rack in electrical closet. Label the panels "327A", "327B", "327C", "327D", and "327E" with the top panel being "A" and the bottom panel "E".

B.  From the relay rack, pull designated number of blue Belden UTP and white Belden UTP cables to floor boxes as shown in Table 2. Floor box locations are shown on attached diagram of building. At each floor box, assemble 4 blue network cables and 1 white phone cable into a "whip" of length as designated in Table 3. Terminate the cables in a Siemon SP5-T4 module. Dress and punch all blue network cables in accordance with EIA568A requirements. Punch single white telephone cable such that blue and orange pairs are on pins 4,5 and 3,6 of jack 5 in the SP5 and the green and brown pairs are on pins 4,5 and 3,6 of jack 6 in the SP5.  In the electrical closet, terminate the blue network cables in Siemon HD5 panels as designated in Table 3. Test each circuit using a Microtest Pentascanner or equivalent. Test results must be saved on floppy disk.

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C. Label the SP5's with corresponding patch panel locations and phone lines. For example, the first SP5 would have a label "A1 A2 A3 A4 P1 P2". Labels will be provided by the Fermi CDF group if requested. In the electrical closet, the unterminated phone lines should also be labeled. In the above example, the white phone line would be labeled "P1,2" in the electrical closet.

D. The UTP whips from the floor boxes to the SP5's should be dressed every 18" with cable ties. The network cables in the electrical closet should have a final dressing consistent with good networking standards. The final dressing of the white phone lines in the electrical closet will be done by TELCO.

## Table 1.   Parts List

| Part Description | Part Number | Quantity |
|---|---|---|
| Cable, UTP, 4pr, Solid, PVC, Cat5, white, 1000' spool | Belden 1583A-WHT | 7 |
| Cable, UTP, 4pr, Solid, PVC, Cat5, blue, 1000' spool | Belden 1583A-BLU | 26 |
| Panel, UTP, 6-Port SP5 Surface Pack Module T568A | Siemon SP5-T4 | 60 |
| Modular Patch Panel, Cat5e, T568A, 48 port | Siemon HD5-48-T4 | 5 |

## Table 2.   Conduit/FloorBox Details

| Conduit Number | Undressed Cable Length (ft) | Number of SP5's | Number of Network Cables (blue) | Number Phone Cables (white) | Net Length Blue UTP (ft) | Net Length White UTP (ft) |
|---|---|---|---|---|---|---|
| 1 | 122 | 3 | 12 | 3 | 1464 | 366 |
| 2 | 114 | 4 | 16 | 4 | 1824 | 456 |
| 3 | 93 | 4 | 16 | 4 | 1488 | 372 |
| 4 | 112 | 4 | 16 | 4 | 1792 | 448 |
| 5 | 69 | 4 | 16 | 4 | 1104 | 276 |
| 6 | 88 | 4 | 16 | 4 | 1408 | 352 |
| 7 | 72 | 4 | 16 | 4 | 1152 | 288 |
| 8 | 85 | 3 | 12 | 3 | 1020 | 255 |
| 9 | 122 | 3 | 12 | 3 | 1464 | 366 |
| 10 | 96 | 4 | 16 | 4 | 1536 | 384 |
| 11 | 112 | 4 | 16 | 4 | 1792 | 448 |
| 12 | 77 | 4 | 16 | 4 | 1232 | 308 |
| 13 | 122 | 4 | 16 | 4 | 1952 | 488 |
| 14 | 85 | 4 | 16 | 4 | 1360 | 340 |
| 15 | 106 | 4 | 16 | 4 | 1696 | 424 |
| 16 | 103 | 3 | 12 | 3 | 1236 | 309 |
| **Total** | | **60** | | | 23520 | 5880 |
| **Total+10%** | | | | | **25872** | **6468** |
| | | | | | (BLUE) | (WHITE) |

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**Table 3.   Drop Details.**

| Conduit Number | Building Location | Floor Box Location | Whip Length (ft.) | Patch Panel | Phone Jack |
|---|---|---|---|---|---|
| 1 | 327 East | (see map) | 30 | A1-4 | P1,P2 |
| 1 | 327 East | (see map) | 7 | A5-8 | P3,P4 |
| 1 | 327 East | (see map) | 30 | A9-12 | P5,P6 |
| 2 | 327 East | (see map) | 17 | A13-16 | P7,P8 |
| 2 | 327 East | (see map) | 17 | A17-20 | P9,P10 |
| 2 | 327 East | (see map) | 7 | A21-24 | P11,P12 |
| 2 | 327 East | (see map) | 7 | A25-28 | P13,P14 |
| 3 | 327 East | (see map) | 7 | A29-32 | P15,P16 |
| 3 | 327 East | (see map) | 7 | A33-36 | P17,P18 |
| 3 | 327 East | (see map) | 17 | A37-40 | P19,P20 |
| 3 | 327 East | (see map) | 17 | A41-44 | P21,P22 |
| 4 | 327 East | (see map) | 12 | A45-48 | P23,P24 |
| 4 | 327 East | (see map) | 12 | B1-4 | P25,P26 |
| 4 | 327 East | (see map) | 25 | B5-8 | P27,P28 |
| 4 | 327 East | (see map) | 25 | B9-12 | P29,P30 |
| 5 | 327 East | (see map) | 25 | B13-16 | P31,P32 |
| 5 | 327 East | (see map) | 25 | B17-20 | P33,P34 |
| 5 | 327 East | (see map) | 12 | B21-24 | P35,P36 |
| 5 | 327 East | (see map) | 12 | B25-28 | P37,P38 |
| 6 | 327 East | (see map) | 17 | B29-32 | P39,P40 |
| 6 | 327 East | (see map) | 17 | B33-36 | P41,P42 |
| 6 | 327 East | (see map) | 7 | B37-40 | P43,P44 |
| 6 | 327 East | (see map) | 7 | B41-44 | P45,P46 |
| 7 | 327 East | (see map) | 7 | B45-48 | P47,P48 |
| 7 | 327 East | (see map) | 7 | C1-4 | P49,P50 |
| 7 | 327 East | (see map) | 17 | C5-8 | P51,P52 |
| 7 | 327 East | (see map) | 17 | C9-12 | P53,P54 |
| 8 | 327 East | (see map) | 30 | C13-16 | P55,P56 |
| 8 | 327 East | (see map) | 7 | C17-20 | P57,P58 |
| 8 | 327 East | (see map) | 30 | C21-24 | P59,P60 |
| 9 | 327 West | (see map) | 30 | C25-28 | P61,P62 |
| 9 | 327 West | (see map) | 7 | C29-32 | P63,P64 |
| 9 | 327 West | (see map) | 30 | C33-36 | P65,P66 |
| 10 | 327 West | (see map) | 17 | C37-40 | P67,P68 |
| 10 | 327 West | (see map) | 17 | C41-44 | P69,P70 |
| 10 | 327 West | (see map) | 7 | C45-48 | P71,P72 |
| 10 | 327 West | (see map) | 7 | D1-4 | P73,P74 |
| 11 | 327 West | (see map) | 7 | D5-8 | P75,P76 |
| 11 | 327 West | (see map) | 7 | D9-12 | P77,P78 |
| 11 | 327 West | (see map) | 17 | D13-16 | P79,P80 |
| 11 | 327 West | (see map) | 17 | D17-20 | P81,P82 |

| 12 | 327 West | (see map) | 12 | D21-24 | P83,P84 |
|----|----------|-----------|----|--------|---------|
| 12 | 327 West | (see map) | 12 | D25-28 | P85,P86 |
| 12 | 327 West | (see map) | 25 | D29-32 | P87,P88 |
| 12 | 327 West | (see map) | 25 | D33-36 | P89,P90 |
| 13 | 327 West | (see map) | 25 | D37-40 | P91,P92 |
| 13 | 327 West | (see map) | 25 | D41-44 | P93,P94 |
| 13 | 327 West | (see map) | 12 | D45-48 | P95,P96 |
| 13 | 327 West | (see map) | 12 | E1-4 | P97,P98 |
| 14 | 327 West | (see map) | 17 | E5-8 | P99,P100 |
| 14 | 327 West | (see map) | 17 | E9-12 | P101,P102 |
| 14 | 327 West | (see map) | 7 | E13-16 | P103,P104 |
| 14 | 327 West | (see map) | 7 | E17-20 | P105,P106 |
| 15 | 327 West | (see map) | 7 | E21-24 | P107,P108 |
| 15 | 327 West | (see map) | 7 | E25-28 | P109,P110 |
| 15 | 327 West | (see map) | 17 | E29-32 | P111,P112 |
| 15 | 327 West | (see map) | 17 | E33-36 | P113,P114 |
| 16 | 327 West | (see map) | 30 | E37-40 | P115,P116 |
| 16 | 327 West | (see map) | 7 | E41-44 | P117,P118 |
| 16 | 327 West | (see map) | 30 | E45-48 | P119,P120 |

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## Figure 1.    General Scheme Conceptual Drawing



**Relay Rack**  (existing)

- Siemon HD5-48-T4
- Siemon HD5-48-T4
- Siemon HD5-48-T4
- Siemon HD5-48-T4
- Siemon HD5-48-T4

Unterminated Telco

Cat5e UTP - white
(for telephone)

Cat5e UTP - blue
(for network)

Existing 2" conduit
in floor

Floor Box

4 blue network
lines per SP5

Siemon SP5-T4

1 white telephone line
per SP5

Siemon SP5-T4

Siemon SP5-T4

Siemon SP5-T4

5 UTP cables per SP5 at
end of bundled "whip"
(see document)

## Figure 2. Siemon SP5-T4 Surface Pack Module



A01 A02 A03 A04 P001 P002
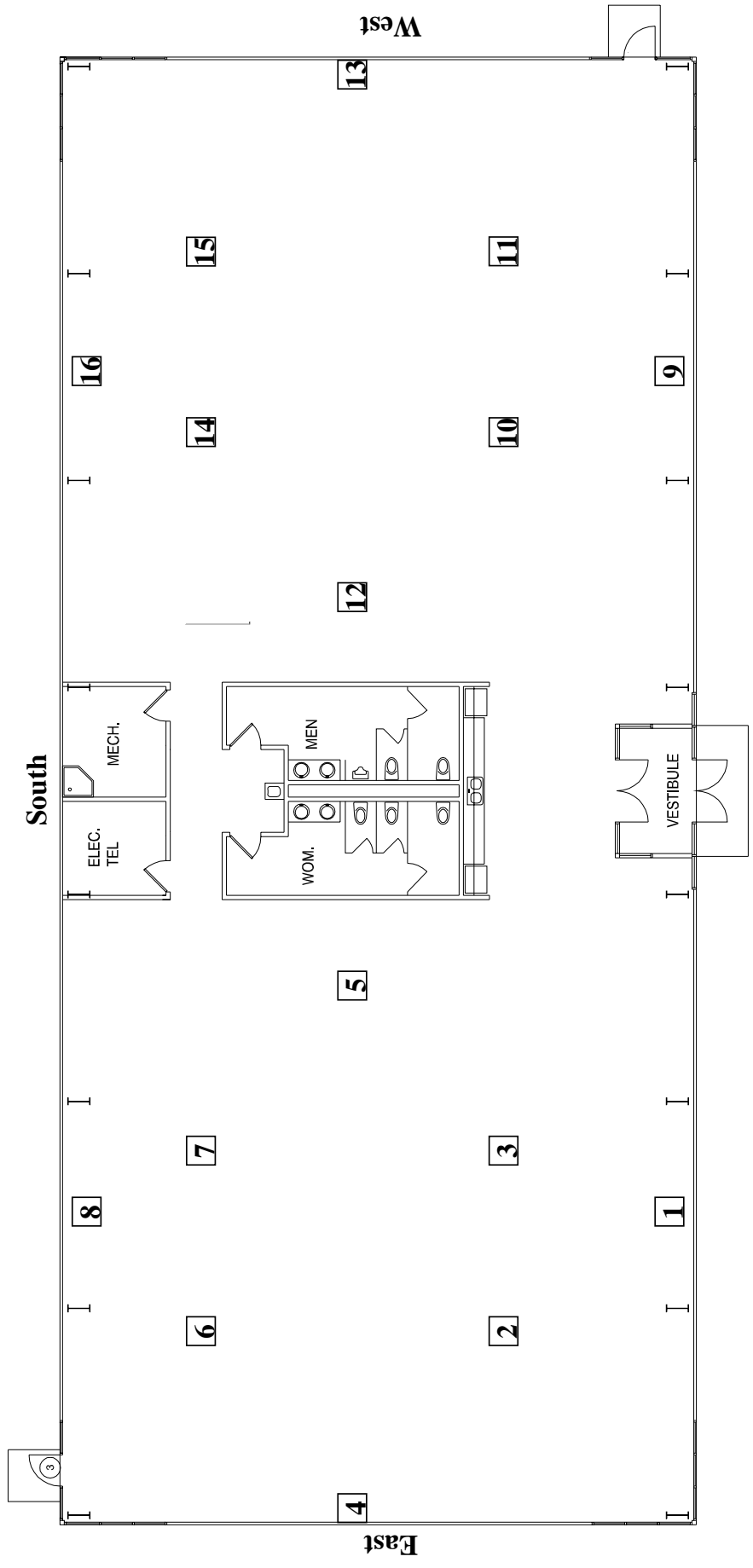
# NETWORK FLOOR BOX LOCATIONS

# SP5™ Category 5e Surface Pack Module Instructions
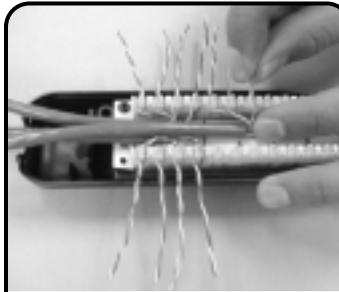


**1** Route and lace the cables into the S110® blocks, beginning with the S110® blocks closest to the cable entrance (positions 5 & 6).

*Note: For modules with both T568A/B wiring, follow the label on the inside of the base for wiring scheme.*
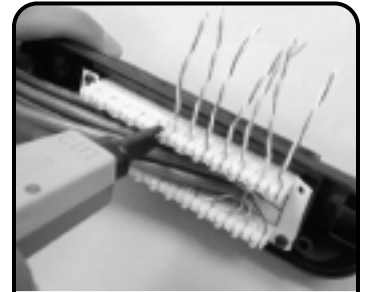
**2** Using a single position 110-style impact tool (P/N: S814-110), terminate the cables onto the S110® connecting blocks.

Label    Strain Relief Wall
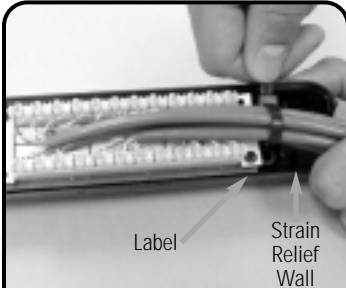
**3** Ensuring cables have proper alignment with the circular opening, secure the cables with the cable tie provided. For proper strain relief of the cable, the cable tie should be located between the strain relief wall and the internal label.

**4** If using the optional magnets for mounting the SP5™ module, insert magnets in base as shown.

**5** Close module by securing the cover and base with the two #4-24 screws provided. The screws should be inserted from the base into the cover using the two counter sunk holes in the base.

**6** If using the optional magnets, simply mount the module on the metallic surface.

If mounting on an alternate surface, screw the module to the surface with the appropriate hardware using the (2) through holes on the cover (use #6 screws which must be at least 56mm [2.25 in.] in length).

**7** Label the module using the icon label/holder provided. Remove paper from adhesive backing of the holder. Locate bottom lip of icon/label holder to bottom edge of recessed numbered area on module cover and press firmly. The holder can be mounted to either side of the cover. Slide label in and snap in icons (available separately).
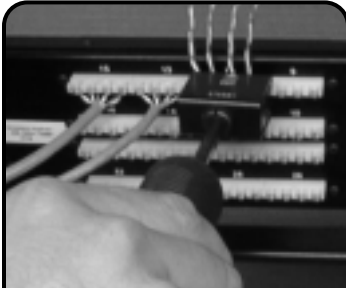
# HD5® Patch Panel Instructions
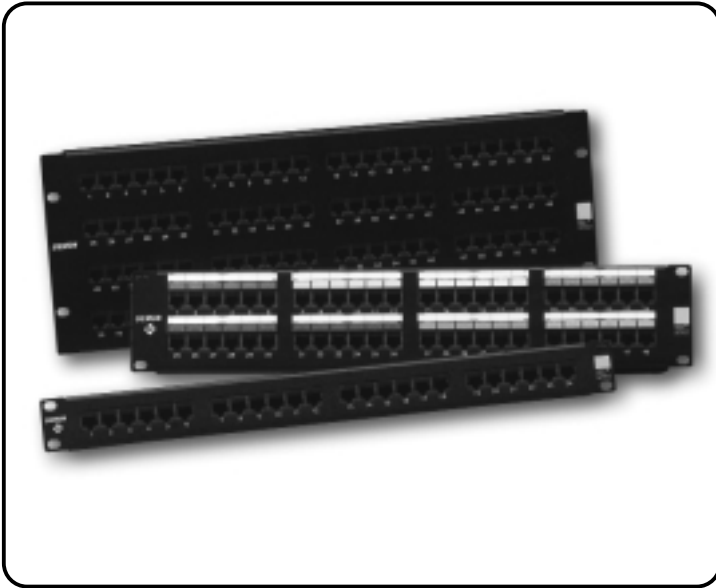


**1** Using the #12-24 machine screws and washers provided, mount the patch panel on a 19 inch rack.
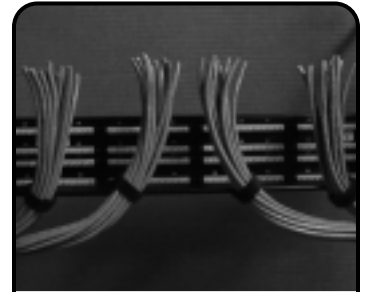
**2** We recommend that half the cables be routed from the left and half from the right. Allow 2-4 in. (5-10 cm) of slack past the connecting blocks for termination.

**3** Starting at one end, terminate cable to the S110® connecting blocks and work towards the middle. If cables are routed from top of panel, terminate from the top down. If routed from the bottom, terminate from the bottom up.

*Note: For panels with universal T568A/B wiring, see label on the back of panel for wiring schemes.*
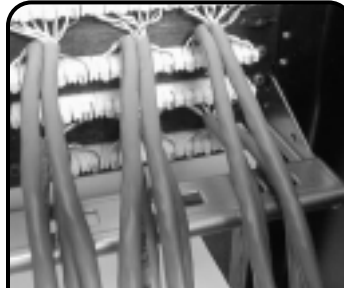
**4** *Using Rear Cable Manager -* Attach the cable management bracket, (P/N HD-RWM) to the HD5® panel using the slots on the back of the panel.
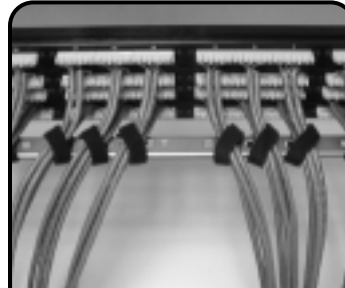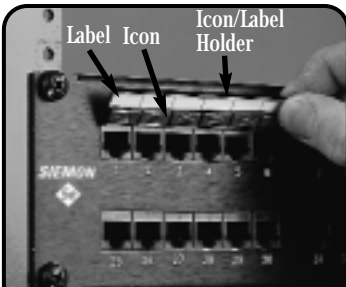
**5** *Using Rear Cable Manager -* Secure the cables to the cable manager using supplied cable ties or optional velcro cable managers.
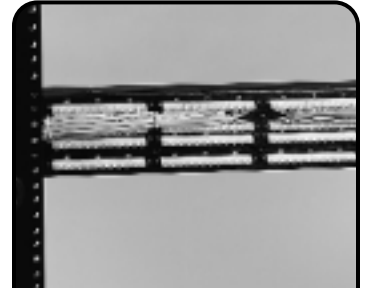
**6** *Without Rear Cable Manager -* Using the raised eyelets along the cable termination path, tie down the cable with the cable ties provided.

*Note: Cable ties should be loosely cinched to not deform the bundle or cable jacket.*

**7** Use the HD5-ICON holder to color code ports. Peel paper from adhesive backing of HD5-ICON holder, locate bottom lip of icon/label holder to top edge of jacks on patch panel and press firmly.

**8** Slide paper label into top of holder and snap icons into icon pockets.

**To assist safe installations, comply with the following:**

A. Use caution when installing or modifying telecommunications circuits.

B. Never touch uninsulated wire terminals unless the circuit has been disconnected.

C. Never install this device in a wet location.

D. Never install wiring during a lightning storm.