

Fermilab CD/DCI Tech Note

Cable, UTP-TN-005.2

The following are construction requirements for Fermilab Computing Division Data Communication's Category-3 unshielded-twisted-pair (UTP) trunk ("backbone") cables. Users should always purchase Category-3 (Cat3) cables from recommended vendors only, to ensure compliance with tech notes. Call Fermi CD/ Data Comm. for a list of qualified vendors or visit our web page at <http://computing.fnal.gov/dci/Document-pdf-Files/Cable-Assy-Houses.pdf>. Use the Fermi part number(s) on Purchase Requests when ordering cables, unless directed otherwise. *Red sidebar indicates most recent change to this Tech Note. Orange sidebar indicates previous change.*



1. CABLE

- a.) Standard solid wire Cat3 non-plenum (PVC) trunk cables must be made from Belden 1232A cable or equivalent. Standard solid wire Cat3 plenum (PLN) cables must be made from Belden 1247A or equivalent.

2. CONNECTORS

- a.) A "Right" oriented cable is defined as a cable routing to the right of the back of a patch panel when RJ21 pin#1 is up (on the top row of the horizontal connector). A "Left" oriented cable is defined as a cable routing to the left of the back of a patch panel when RJ21 pin#1 is up. RJ21 plugs shall be referred to as "male" and jacks shall be referred to as "female".
- b.) "Right 90 degree Male" (RM), "Left 90 degree Male" (LM) RJ21 connectors for solid wire must be AMP 1-229912-1. "Right 90 degree Female" (RF) and "Left 90 degree Female" (LF) RJ21 connectors for solid wire must be AMP 1-229913-1.
- c.) "Center Male" (CM) RJ21 180-degree in-line connectors for solid wire must be AMP. "Center Female" (CF) RJ21 180-degree in-line connectors for solid wire must be AMP.

3. DESIGN

- a.) A "Right" oriented cable is defined as a cable routing to the right of the back of a patch panel when RJ21 pin#1 is up, on the top row of the horizontal connector. (See drawing below.)
- b.) A "Left" oriented cable is defined as a cable routing to the left of the back of a patch panel when RJ21 pin#1 is up.
- c.) In-line (180 degree) connectors shall be defined as Center Male (CM) and Center Female (CF).
- d.) RJ21 plugs shall be referred to as "male" and jacks shall be referred to as "female".

Fermilab CD/DCI Tech Note

Cable, UTP-TN-005.2

4. PERFORMANCE

- a.) Connectors and cable assemblies must meet EIA/TIA 568 Cat3 requirements.
- b.) Wiring shall meet FCC Part68 RJ21 pin out requirements.

5. MECHANICAL

- a.) Connectors must have proper strain relief such that tugging forces are not exerted directly on the individual conductors.
- b.) Heat shrink must be applied 1.5" long at the neck with 0.75" exposed outside of the hood.

6. LABELING

- a.) Cables must be labeled flag-style, six inches from the RJ21 connector, on both ends. For an unconnectorized end, the label should be six inches from the end of the jacket.
- b.) All cable labels must contain the following information: the vendor name, the vendor part number and a unique serial number. Serial numbers must be in one of the following formats:

1.) Purchase Orders

The serial number shall be derived from the Purchase Order number and be in the following format: XXX-YYYYYY, where XXX is a number that begins from 001 and increments by 1 up to the total number of cables being made by that vendor for that Purchase Order (regardless of whether the Purchase Order includes other assembled cables which are not Cat3 trunk) and YYYYYY is the Purchase Order number.

2.) Computing Division ProCard Orders

The serial number shall be derived from the ProCard number and be in the following format: XXX-ZZZZ, where XXX is a number that begins from 001 and increments by 1 up to the total number of cables being made by that vendor for that ProCard Order (regardless of whether the ProCard Order includes other assembled cables which are not Cat3 trunk); ZZZZ is the PRN number.

3.) Non-Computing Division ProCard Orders

The serial number shall be derived from the ProCard number and be in the following format: XXX-ZZZZ-MMDDYY, where XXX is a number that begins from 001 and increments by 1 up to the total number of cables being made by that vendor for that ProCard Order (regardless of whether the ProCard Order includes other assembled

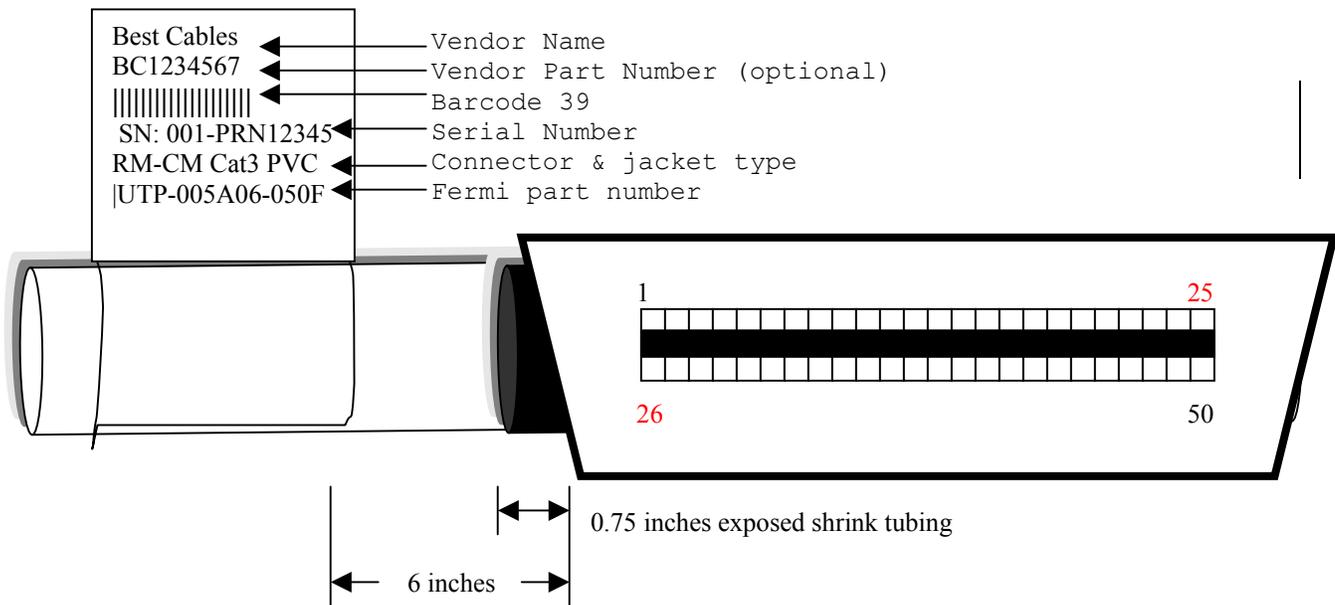
Fermilab CD/DCI Tech Note

Cable, UTP-TN-005.2

cables which are not Cat5 trunk); ZZZZ are the last four digits of the ProCard number and MMDDYY is the month, day and year of the ProCard order.



- c.) Vendors shall keep track of order numbers so that they do not get reused in future serial numbers, thereby preventing any two cables from having the same serial number.
- d.) The labels shall also include the cables' end-end type (i.e. RM-CM) its jacket type (PVC or PLN), the appropriate Fermi part number and the length in feet (F) or meters (M) for that cable. The following is an example of the label format:



- e.) The labels must be Kroy 2556701, Panduit LS5-10 or equivalent.
- f.) The labels must be laminated such that the information on the labels does not smear, fade or become unreadable under normal handling and installation conditions.
- g.) The font size **must** be 8-point or greater. Tiny, blotchy, smeared or otherwise unreadable characters will not be accepted.

Fermilab CD/DCI Tech Note

Cable, UTP-TN-005.2

7. PART NUMBERS

<u>Fermi #</u>	<u>Description</u>
UTP-005A00	Cable,UTP,RJ21RM-RJ21RM,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A01	Cable,UTP,RJ21RM-RJ21RM,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A02	Cable,UTP,RJ21CM-RJ21CM,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A03	Cable,UTP,RJ21CM-RJ21CM,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A04	Cable,UTP,RJ21LM-RJ21LM,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A05	Cable,UTP,RJ21LM-RJ21LM,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A06	Cable,UTP,RJ21RM-RJ21CM,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A07	Cable,UTP,RJ21RM-RJ21CM,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A08	Cable,UTP,RJ21LM-RJ21CM,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A09	Cable,UTP,RJ21LM-RJ21CM,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A10	Cable,UTP,RJ21RF-RJ21RF,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A11	Cable,UTP,RJ21RF-RJ21RF,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A12	Cable,UTP,RJ21CF-RJ21CF,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A13	Cable,UTP,RJ21CF-RJ21CF,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).
UTP-005A14	Cable,UTP,RJ21LF-RJ21LF,Cat3,Solid,PVC (AMP RJ21 connectors, Belden 1232A cable).
UTP-005A15	Cable,UTP,RJ21LF-RJ21LF,Cat3,Solid,PLN (AMP RJ21 connectors, Belden 1247A cable).

Fermilab CD/DCI Tech Note

Cable, UTP-TN-005.2

- UTP-005A16 Cable,UTP,RJ21RF-RJ21CF,Cat3,Solid,PVC
(AMP RJ21 connectors, Belden 1232A cable).
- UTP-005A17 Cable,UTP,RJ21RF-RJ21CF,Cat3,Solid,PLN
(AMP RJ21 connectors, Belden 1247A cable).
- UTP-005A18 Cable,UTP,RJ21LF-RJ21CF,Cat3,Solid,PVC
(AMP RJ21 connectors, Belden 1232A cable).
- UTP-005A19 Cable,UTP,RJ21LF-RJ21CF,Cat3,Solid,PLN
(AMP RJ21 connectors, Belden 1247A cable).