EIA/TIA-568 Commercial Building
Telecommunications Wiring Standard

HISTORY OF THE EIA/TIA-568 STANDARD: At the beginning of 1985, companies representing the telecommunications and computer industries were concerned with the lack of a standard for building telecommunications wiring systems. The Computer Communications Industry Association (CCIA) requested that the Electronics Industries Association (EIA) develop this necessary standard. Six years in the making, the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard is the result of their efforts. Published in July of 1991, the EIA/TIA 568 standard serves the following purposes:

Purpose of the EIA/TIA-568 Standard:

- Specifies generic telecommunication cabling system which supports multiproduct, multivendor environment.
- Provides direction for commercial telecommunication product design
- Enables planning and installation of cabling with minimum knowledge of the telecommunication products to be installed
- Establishes performance/technical criteria for various cabling system configurations

Scope of the EIA/TIA-568 Standard

The Standard specifies:

- minimum requirements for telecommunications cabling within an office environment
- recommended topology and distances
- media by parameters which determine performance
- connectors and pin assignments to ensure interconnectability
- the useful life of telecommunications cabling systems as being in excess of ten years

This document is meant as a reference source that highlights the key points of the EIA/TIA-568 Standard and its soon-to-be-revised version. The long- awaited revision to the standard is expected to be completed sometime in 1994.

Whenever this document cites anticipated changes from the revised standard, those changes appear as *italics.*

This document is not intended as a substitute for the original document. For a further discussion of any topic in this guide, please refer to the actual EIA/TIA-568 Standard.

1. **Building Entrance**

Building entrance facilities provide the point at which outside cabling interfaces with the intra-building backbone cabling. The physical requirements of the network interface are defined in the EIA/TIA-569 Standard.

2. **Equipment Room**

The design aspects of the equipment room are specified in the EIA/TIA 569 standard. Equipment rooms usually house equipment of higher complexity than do telecommunication closets. Any or all of the functions of a telecommunications closet may be provided by an equipment room.
3. **Backbone Cabling**

*(Specified Topology: Hierarchical Star)*

Backbone cabling runs between telecommunications closets, equipment rooms, and entrance facilities (main cross-connects) within the telecommunications cabling system infrastructure.

Four media types are recognized as options for backbone cabling with maximum distances as follows:

1. 100 ohm UTP cable (800 meters maximum) - 24 AWG solid conductors - 25 pair binder groups - cable may be shielded
2. 150 ohm STP cable (700 meters maximum)
3. 62.5/125 um multimode optical fiber cable (200 meters maximum)
4. Single mode optical fiber cable (3000 meters maximum)

4. **Telecommunications Closet**

A telecommunications closet is the area within a building that houses the telecommunications cabling system equipment. This includes the mechanical terminations and/or cross-connect for the horizontal and backbone cabling system. Please refer to EIA/TIA-569 for the design specifications of the telecommunications closet.

5. **Horizontal Cabling** *(specified Topology: Star)*

The horizontal cabling system extends from the work area telecommunications (information) outlet to the telecommunications closet and consists of the following:

- Horizontal Cabling
- Telecommunications Outlet
- Cable Terminations
- Cross-connections

Three media types are recognized as options for horizontal cabling, each extending a maximum distance of 90 meters:

5. Four-pair 100 ohm UTP cable (24 AWG solid conductors)
6. Two-pair 150 ohm STP cables
7. Two fiber 62.5/125 um optical fiber cable

*The next revision of the EIA/TIA-568 Standard will not recognize coaxial cable as a cabling choice, even though it does appear in the current 568 document.*

6. **Work Area**

The work area components extend from the telecommunications (information) outlet to the station equipment. Work area wiring is designed to be relatively simple to interconnect so that moves, adds and changes are easily managed.

**Work Area components**

- **Station Equipment** - computers, data terminals, telephones, etc.
- **Patch Cables** - modular cords, PC adapter cables, fiber jumpers, etc.
- **Adapters** - baluns, etc. **must be external to telecommunications outlet.**
**Telecommunications Outlet**

**Two ports minimum**

1. 100 ohm, 4-pair UTP
2. 100 ohm, 4-pair UTP 150 ohm, 2-pair STP or 62.5/125 um fiber

In addition to the 90 meters of horizontal cable, a total of 10 meters is allowed for work area and telecommunications closet patch and jumper cables.

**MEDIA AND CONNECTING HARDWARE PERFORMANCE SPECIFICATION**

**100 ohm Unshielded Twisted Pair (UTP) Cabling Systems**

**Horizontal Cable**

As transmission rates have increased, higher performance UTP cabling has become a necessity. In addition, some means of classifying horizontal UTP cables and connection hardware by performance capability had to be established. These capabilities have been broken down to a series of categories as follows:

- Category 3: Cables/connection hardware with transmission characteristics up to 16 MHz
- Category 4: Cables/connecting hardware with transmission characteristics up to 20 MHz
- Category 5: Cables/connecting hardware with transmission characteristics up to 100 MHz

**Characteristic Impedance** of horizontal categorized cables = 100 ohms + 15% from 1 MHz to the highest referenced frequency at a particular category (16, 20. or 100 MHz).

**DOCUMENTS FOR FURTHER INFORMATION**

- **EIA/TIA-568**: Commercial building Telecommunications Wiring Standard
- **EIA/TIA-569**: Commercial Building Standard for Telecommunications Pathways and spaces
- **EIA/TIA-570**: Residential and Light Commercial Telecommunication Wiring Standard
- **EIA/TIA-606**: Administration Standard for the Telecommunications Infrastructure of commercial Buildings
- **EIA/TIA-607**: Commercial building grounding/Bonding Requirements
- **TSB 36**: Technical Systems Bulletin-Additional Cable Specifications for unshielded Twisted pair Cables
- **TSB 40**: Technical Systems Bulletin-Additional Transmission Specifications for Unshielded Twisted Pair Connecting Hardware
- **IEEE 802.3-1990**: (also known as ANSI/IEEE Std 802.3-1990) or ISO 8802-3: 1990 (E), Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications
- **IEEE 802.5-1989**: (also known as ANSI/IEEE Std 802.5-1989), Token ring Access method and Physical layer Specifications