SFOF Cable Control

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Frequent reconfiguration of the Space Flight Operations Facility to meet changing mission requirements necessitates complex cable changes throughout the building. This article summarizes a detailed well-defined cabling plan which maintains discipline in the installation and removal of cabling.

I. Introduction

The SFOF experiences frequent reconfigurations both in its physical layout and functional capabilities. These changes are necessary in order to meet new requirements placed on it by the DSN and unmanned spaceflight programs. Without a detailed well-defined cabling plan, there would be problems with the installation of new cables, rerouting of existing cables, and disposition of unused cables. Such conditions would result in overly congested cable drops, cable ducts, and unruly cable lays.

This paper discusses the procedures developed to maintain cognizance and control of the cabling in the SFOF.

II. Establishing Cable Routes

There are cable drops and cable ducts that interconnect the floors of the building. The cable drops are cutouts in the floor that give access to the cable ducts, which are vertical enclosures between floors. The cable drops and cable ducts were located, identified and documented. Figure 1 is a typical example of the documentation of the cable drops and cable ducts for the four floors. With the documentation of the cable drops and cable ducts, the vertical cable routes may be determined.

The horizontal cable runs, which are under computer flooring, may be determined from the same set of draw-

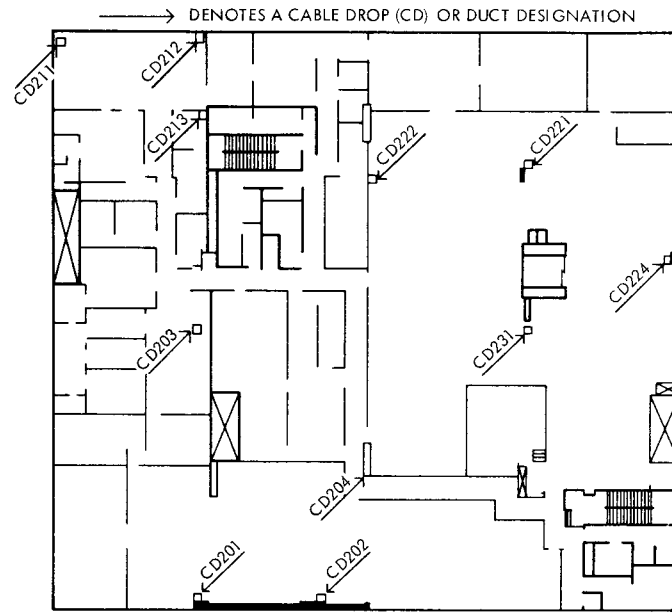

Fig. 1. Cable drops and cable ducts

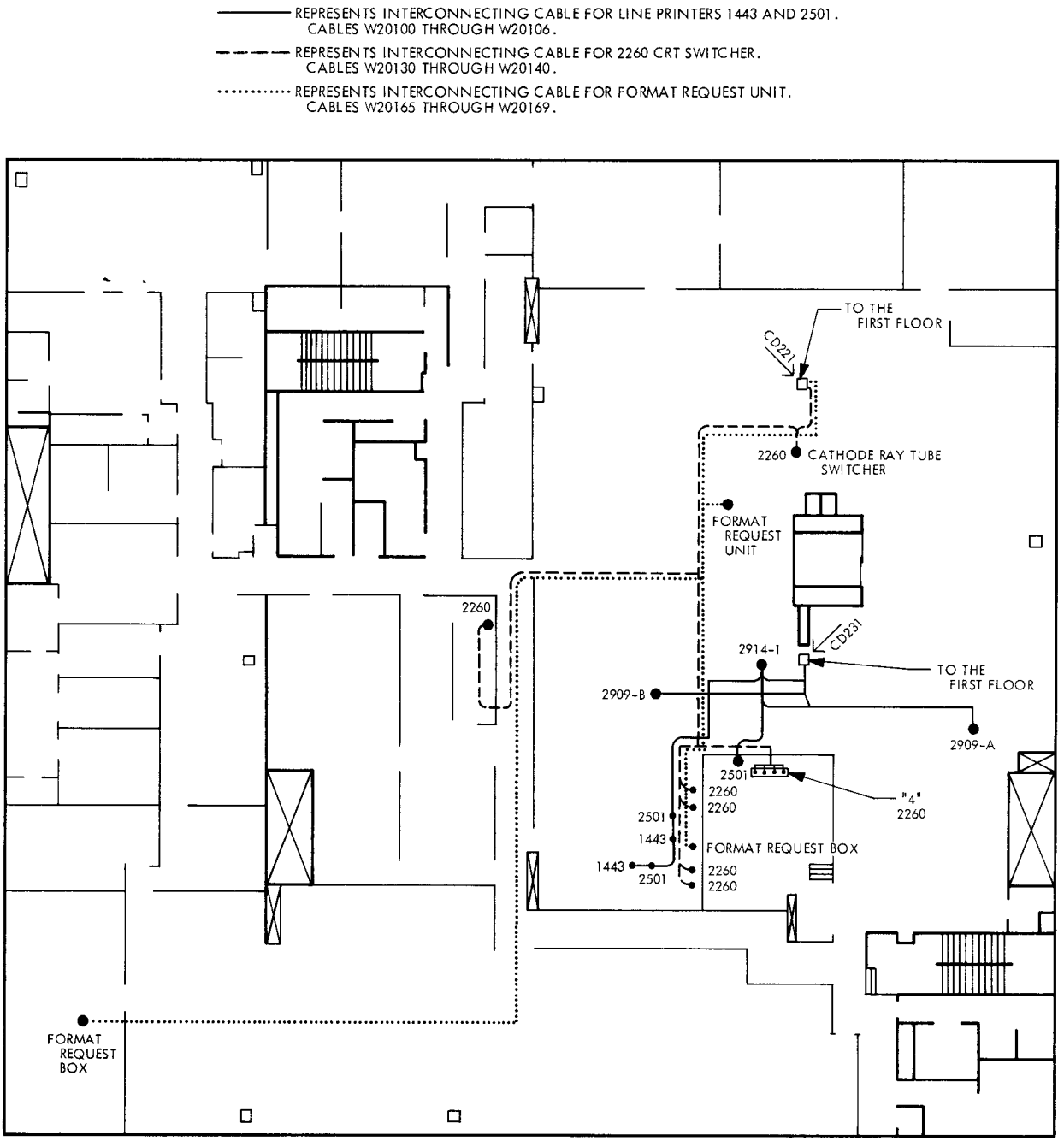

Fig. 2. Cable routing

ings (Fig. 1). The drawings are to scale, and the architectural configuration and the equipment layouts of the various floors are maintained on this set of drawings. Once the equipment layouts are complete for any given area, the cable routing may be determined. The cable routing will then be documented. Figure 2 is typical of this type of documentation. This, then, shall be the way in which the cables are installed. This method eliminates the congestion in the cable drops, cable ducts, and horizontal cable lays.

When a system is removed or changed, the cable documentation shall be revised to indicate the modifications or deletions. This makes it possible to control the cable density in the cable drops, cable ducts, and cable lays.

III. Standardization of Cables

Figure 3 is representative of a standard cable drawing. As new cable requirements arise, an effort is made to use a cable drawing already in existence. This reduces the number of different types of connectors and wires in a system and also results in a cost savings. In the electromechanical design phase of a system, every effort is made to incorporate the standard cables by selecting interface connectors that will mate with a standard cable and still fulfill the interconnecting requirements.

IV. Cable Inventory

With the large quantity of cables that are used in the facility and the fact that cables normally do not wear out, it is advantageous to reuse the cables. This is accomplished by maintaining a cable inventory.

The cables are identified with a JPL part number. This part number consists of two parts: the basic drawing number and the number indicating the length of the cable in feet. The cable will have its part number attached to it by use of a self-adhering label.

Having identified the cables and documented their routing, maintaining an "in use" status on the cables can be accomplished. As a data processing system is revised or removed, the cables taken out of service may then be stored for future use.

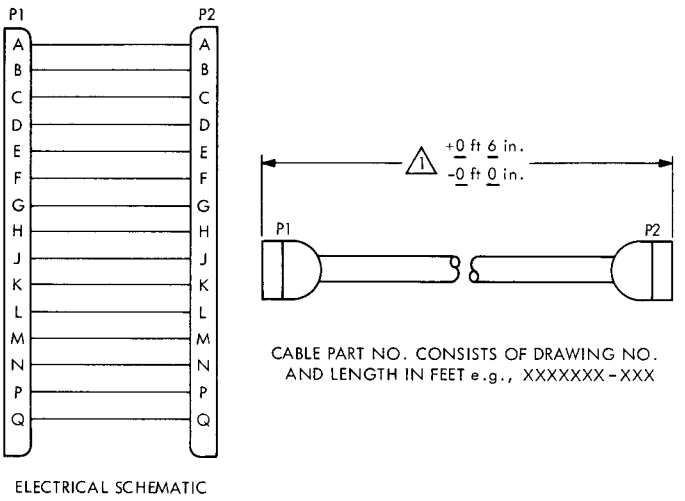

Fig. 3. Standard cable

V. Conclusion

Because of the complexity of the SFOF and the constant upgrading of its capabilities, it was important that a system for maintaining discipline in the installation and removal of the cabling be developed.

With the ability to predetermine cable routes, we can define the length of a cable, limit the density of cable drops and cable ducts, and using the standard cable inventory, determine if a cable is available, or if one will have to be made.