

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Flat Conductor Cable Handbook

A comprehensive, detailed reference handbook on the design, manufacture, and installation of flat conductor cables (FCC), connectors, and supporting hardware, presents the state of the art through June 1968. The advantages of using FCC over regular round wire cable include such technological advances as light weight, reduced space requirements, increased system performance and reliability, and favorable cost factors. For example, the present price of finished FCC is approximately 10 times that of the raw materials. However, the overall cost is less than that of conventional round wire cable in wire sizes of 24 AWG or smaller, and FCC costs should decrease as production volume increases. These factors indicate that the use of FCC will continue to increase, making the handbook of considerable value to both producers and users of flat conductor cables.

The handbook includes: 1) A discussion of the advantages of FCC, such as weight, space, and cost savings, increased thermal capability, and automatic registration control; 2) a discussion of the current status of FCC, with respect to the issuance of military specifications, hardware availability, and existing applications; 3) descriptions and data on available cable, connectors, fasteners and associated hardware; 4) design techniques and applications; 5) wiring techniques, such as cutting, splicing; rerouting within a cable, matrix joints, and various terminating devices; 6) manufacturing and installation techniques; and 7) inspection and test procedures.

The chapter on design techniques provides the necessary information for implementing an FCC system. Advantages and limitations of FCC are discussed, as are various design parameters and imple-

mentation techniques. Many graphs, tables, and nomograms are included to aid in determining various FCC parameters, such as characteristic impedance, resistive heating, shielding effectiveness, capacitive and inductive coupling, and round-wire gage size equivalents.

The quality control section itemizes the various inspection and test procedures required to ensure that manufactured FCC products conform to specifications. A quality control plan relates control points to the flow of material during manufacture. Narrative descriptions of inspections and tests describe defects that may be found during receiving, processing, or installing FCC. Suggested inspection methods can identify the various defects. Existing military specifications and federal test standards are referenced throughout the chapter. An inspection and test plan outline and a set of quality control flow charts provide guidelines for establishing a high-quality FCC inspection system. Specific recommendations may be adapted to conform to existing quality control systems.

#### Notes:

1. The document described above can be obtained from:

National Technical Information Service  
Springfield, Virginia 22151  
Single document price \$3.00  
(or microfiche \$0.95)

#### Reference:

NASA-TM-X-53975 (N70-33186), Flat Conductor Cable Design, Manufacture, and Installation

(continued overleaf)

2. The following related documentation may be obtained from:

U. S. Government Printing Office  
Washington, D.C. 20402

**Reference:**

NASA-SP-5043, Flat Conductor Cable  
Technology (A Report)

National Technical Information Service  
Springfield, Virginia 22151  
Single document price \$3.00  
(or microfiche \$0.95)

**Reference:**

NASA-SP-5924 (01), Tools, Fixtures, and  
Test Equipment for Flat Conductor Cables  
(A Compilation)

**Patent status:**

No patent action is contemplated by NASA.

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