March 1974 B73-10476

NASA TECH BRIEF

Marshall Space Flight Center

Plug-In Integrated/Hybrid Circuit

The problem:

Cable harnesses and connector assemblies are significant cost and size factors in modern electronics. Compared to integrated and hybrid circuits, the cabling is much larger than the circuitry at each end of the wiring harness.

The solution:

Integrated or hybrid circuitry can be installed into standard round bayonet connectors, to eliminate wiring from the connector to the circuit.

How it's done:

In present electronic equipment, the plug and the receptacle are both hard wired (see Figure 1 (a)), and, when mated, they interconnect various electrical functions located in different areas of the system. In the new method, circuits are connected directly into either section of the connector pair, eliminating the need for hard wiring to that section (see Figure 1 (b)).

One application of this technique is shown in Figure 2. A hybrid circuit (a) with all its circuit elements interconnected by an ultrasonically- or thermo-

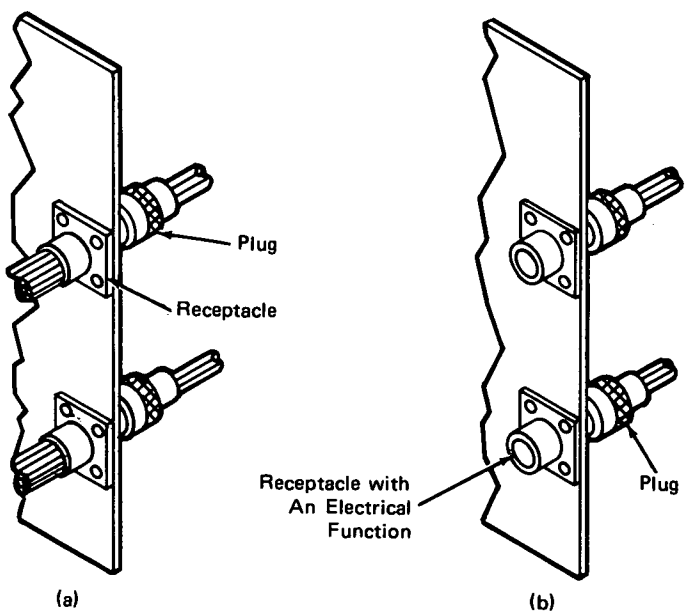

Figure 1. Interconnection Techniques:
(a) Standard Wiring, (b) Wiring Using Integrated or Hybrid Circuits.

(continued overleaf)

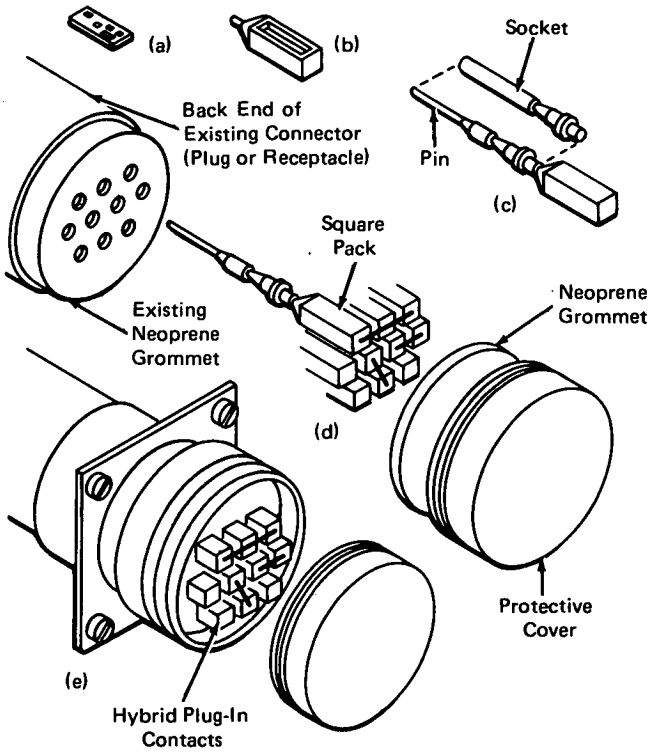

Figure 2. (a) Hybrid Circuit; (b) Square Pack;
(c) Encapsulation and Crimping the Connector Pin;
(d) Incorporation of Hybrids into the Connector;
(e) Complete Assembly.

compression-bonded wire is placed in a square pack (b). The pack then is encapsulated (c), and a transfer pin is inserted into the barrel end of an existing contact (pin or socket) and crimped to make a good mechanical connection.

A complete set of these square packs (d) providing either individual circuit functions or interconnected combinations are inserted into a Neoprene grommet which is a standard part of the connector. The entire assembly then is covered with a protective cover (e).

Notes:

1. Instead of the square packs shown, hybrid circuits also can be constructed as a round flat pack using a single substrate. This pack then is connected into the connector sockets, as has been described.
2. Requests for further information may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Code A&PS-TU
   Marshall Space Flight Center, Alabama 35812
   Reference: B73-10476

Patent status:

NASA has decided not to apply for a patent.

Source: E. J. Stringer of
Rockwell International Corp.
under contract to
Marshall Space Flight Center
(MFS-24470)