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CABLE CONNECTOR ADAPTOR

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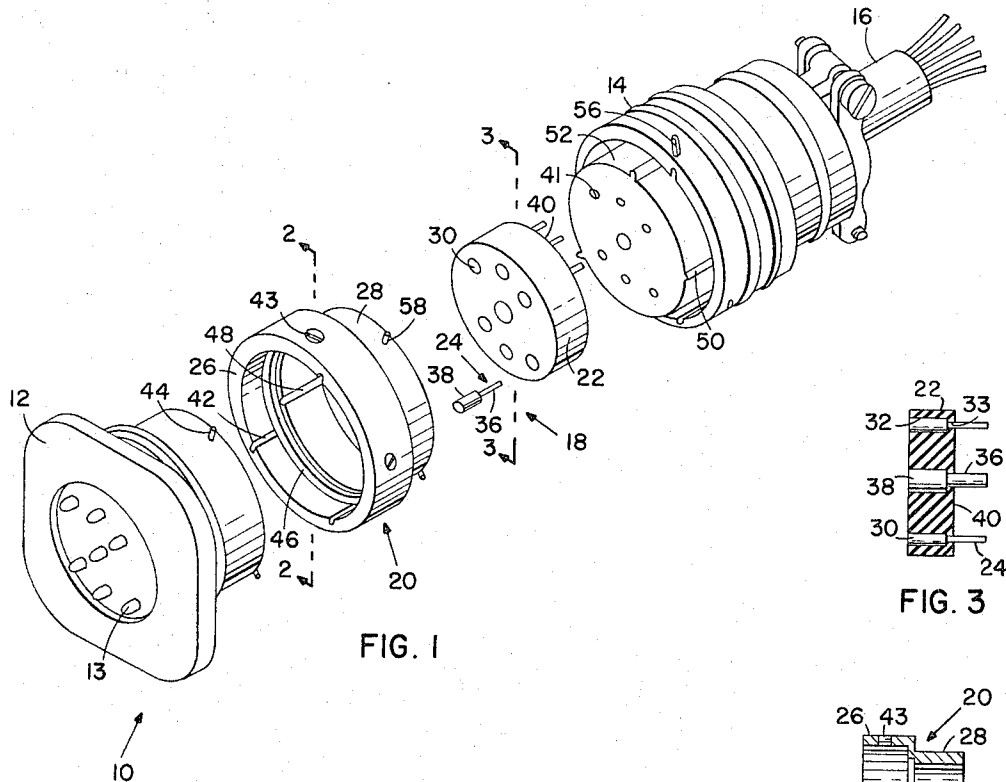


FIG. 1

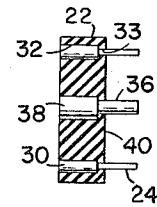


FIG. 3

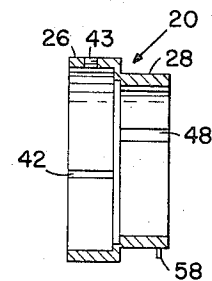


FIG. 2

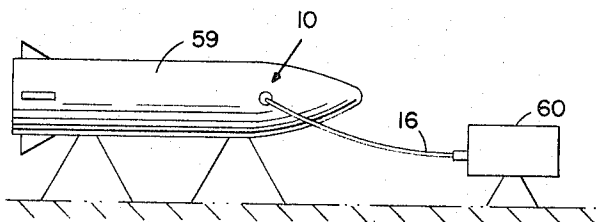


FIG. 4

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CABLE CONNECTOR ADAPTOR

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ABSTRACT OF THE DISCLOSURE

An adaptor for a disconnect type of electrical connector having a pin receptacle including a plurality of pin conductors adapted for connection to a plurality of conductors of a preinstalled circuit. The connector further includes a plug assembly having a cable secured therein with the conductors of the cables communicating into a plurality of apertures in the plug assembly. The adaptor is provided for connecting preselected conductors of the preinstalled circuit with selected conductors of the cable and includes a sleeve having an insert member removably mounted therein. The sleeve is disposed to releasably secure the plug and pin receptacle together. The insert is provided with a plurality of apertures and a pin conductor is releasably mounted in selected ones of the apertures to provide electrical connection between preselected conductors of the cable and of the preinstalled circuit.

In missile systems it becomes necessary to apply rigid environmental tests to various assemblies of the missile. In such tests it is necessary that simulated launch and flight information be provided for testing the ability of the various missile assemblies to perform during flight. It is also desirable to know how a missile would perform should a given component of the various assemblies malfunction. The present invention provides mechanism for introducing "faults" into missile assemblies during tests thereof so that the behavior of the missile in response to the faults may be ascertained.

It is an object of the present invention, therefore, to provide mechanism for inserting errors or faults into a missile system to determine the reaction of the system to the introduced faults during the testing of the missile prior to launch.

It is a further object of the present invention to provide such fault insertion mechanisms for use with wired cables connected to assemblies in the missile without affecting the original electrical configuration thereof.

A feature of the present invention is that modification of existing cable and connector configurations can be achieved by the device of the present invention on a "quick-fix" basis without the need of entering the cable harness on the assembly it connects to.

Other advantages, features and objects of the present invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawing, in which:

FIGURE 1 is an exploded pictorial view of the adaptor of the present invention as used in a typical electrical connector.

FIGURE 2 is a view along line 2-2 of FIGURE 1 illustrating the sleeve used with the adaptor of the invention.

FIGURE 3 is a view along line 3-3 of FIGURE 1 illustrating the adaptor assembly as used in the present invention.

FIGURE 4 is a view of a missile connected to a test console by the connector of the present invention.

As shown in FIGURE 1, a connector assembly generally designated by the numeral 10 is shown to include

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a typical pin receptacle 12 and plug assembly 14. A cable 16 extends from plug 14 to be connected to a test console at the ground control station. Pin receptacle 12 is carried by the missile and includes a plurality of inwardly extending pins 13 which are disposed for electrical connection to the missile assembly or assemblies which are to be tested.

An adaptor assembly 18 is disposed for insertion between members 12 and 14 to connect predetermined electrical conductors leading from the console to the missile assembly. The adaptor includes a sleeve 20 and a pin insert 22 having removable pins 24 therein. As shown in FIGURE 1, sleeve 20 is comprised of a pair of portions 26 and 28, the latter portion being of a smaller internal diameter than the internal diameter of portion 26.

To provide a means whereby predetermined ones of the conductors of the assembly may be electrically connected or disconnected, pin insert 22 is provided with a plurality of apertures 30 (FIGURES 2 and 3) therethrough. Each of the apertures include a pair of portions 32 and 33. Portion 33 is provided with an internal diameter smaller than the internal diameter of portion 32. Pins 24 are disposed for selective insertion into apertures 30, dependent upon the electrical connections required. Pins 24 include a portion 38 which seats in a portion 32 of the pin insert and portion 36 which is disposed to protrude beyond the surface 40 of the pin insert for insertion into a plurality of apertures 41 provided in member 14. Apertures 41 communicate with conductors of cable 16 to permit connection of pins 24 with the conductors of cable 16 and corresponding conductors of receptacle 12.

Sleeve 20 serves to secure members 12 and 14 together in aligned relationship. The sleeve includes, on the inner periphery of portion 26, a plurality of keyways 42 which are disposed to fit over a plurality of projections 44 mounted on pin receptacle 12 where it is locked thereon by means of setscrews 43.

At the inner junction of portions 26 and 28 of sleeve 20, a seat 46 is provided, against which the pin receptacle 12 is seated in the assembly of the connector.

To assemble the sleeve, and thus the pin receptacle with plug 14, there is provided on the inner periphery of portion 28 of the sleeve, a plurality of keyways 48 disposed for snug fitting engagement with a plurality of keys 50 provided on an extending outer portion 52 of plug member 14.

To retain the members in the assembled position, an outer housing 54 of plug member 14 is provided with a plurality of angularly disposed slots 56 which receive therein each of a plurality of projections 58 disposed on the outer periphery of portion 28 of sleeve 20.

As shown in FIGURE 4 assembly 10 connects a missile 59 to a console 60 through cable 16 to test the ability of various components of the missile to perform during flight. To insert a "fault" into a component of the missile to ascertain how the missile would perform under such circumstances, it is merely necessary to disassemble the connector assembly 10 and either add, delete or change positions of the pins in pin insert member 22 to permit electrical connection between predetermined electrical leads of the console and missile components.

It is readily apparent that the device of the present invention provides a means whereby predetermined ones of a plurality of conductors may be readily connected or left disconnected in a cable harness leading between desired missile assemblies and the ground support test equipment without affecting the original electrical configuration of the equipment.

It is to be understood that while a particular embodiment of this invention is shown, that the invention is not

limited thereto, since many modifications may be resorted to that is within the spirit and scope of the appended claims.

I claim:

1. A cable connector assembly including:

- (a) a pin receptacle having a plurality of pin conductors adapted for connection to conductors of a preinstalled electrical circuit;
- (b) a plug assembly disposed for releasable attachment to said pin receptacle and having an electrical cable secured therein, the conductors of the electrical cable being secured in a plurality of apertures carried in said plug assembly;
- (c) a sleeve disposed for releasable attachment to said pin receptacle intermediate said pin receptacle and said plug assembly;
- (d) a pin insert member removably carried in said sleeve and provided with a plurality of apertures, said insert member disposed for retention in said sleeve intermediate said plug assembly and said pin receptacle responsive to assembly thereof;
- (e) a pin contact removably mounted in selected ones of said apertures and extending from one surface of said pin insert member for insertion into selected ones of said apertures of said plug member for electrical connection between predetermined conductors of said electrical cable and said preinstalled circuit through said pin conductors of said pin receptacle.

2. A cable connector adaptor as in claim 1 wherein said sleeve includes a pair of adjoining portions, a first of said portions having a larger internal diameter than the second of said portions, and said adjoining portions forming a seat at the junction thereof to receive said pin receptacle thereagainst.

3. A cable connector adaptor as in claim 2 wherein said sleeve includes:

- (a) a plurality of keyways disposed on the inner periphery of said first portion, said keyways disposed

for snug fitting engagement with projections mounted on said pin receptacle; and,

- (b) locking means carried on the outer periphery of said first portion for retention of said sleeve on said pin receptacle.

4. A device as in claim 3 wherein said sleeve includes:

- (a) a plurality of keyways on the inner periphery of said second portion for snug-fitting engagement with respective keys carried on the periphery of said plug member; and,

- (b) means for securing said sleeve to said plug member.

5. A device as in claim 4 wherein said locking means comprises a plurality of set screws for retention of said sleeve and said pin receptacle in the secured relation.

6. A device as in claim 5 wherein said locking means for securing said sleeve to said plug member includes a plurality of projections on the outer periphery of said second portion of said sleeve, said projections disposed for engagement with each of the plurality of slots disposed on the outer periphery of said plug member for retention of the plug member and sleeve in the secured relationship.

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