Using tiny explosive charges, Western Electric engineers are bonding metals with the elemental "glue" of the Universe.

Here's how it works. The atoms of all metals have a natural attraction for one another. If it weren't for the ever-present film of impurities coating the surface—the oxides, nitrides, and absorbed gasses—all metal atoms would bond to each other when brought together.

**Exploding Things Together.**

But the force of a high-intensity explosion on two adjacent metals will clean away the film of impurities. The explosion literally "blows" the impurities off the surfaces. So the atoms of the different metals can bond together.

The bond that results is stronger than both of the metals themselves.

As an industrial technique, explosive bonding has proved valuable in the manufacture of such heavyweight products as bi-metallic gun barrels.

**Pinpoint Explosions.**

But how would explosives work in the delicate, intricate world of telephone circuitry?

Scientists at Western Electric's Engineering Research Center solved the problem by developing ways to miniaturize and control explosive bonding. Soon, they could splice the ends of two thin communications wires inside a miniature explosive-coated sleeve.

And they could repair tiny defective contacts on delicate circuit boards. These gold contacts (membrane-thin "fingers" 1/10 by 3/4 of an inch) are reclad by thin sheets of gold foil (.0005 inches thick), coated with explosives. The repairs are literally "blown" onto the contacts, without disturbing the delicate circuitry less than 1/10 of an inch away.

Miniaturized explosive bonding is only one way we're helping your Bell Telephone Company hold down the cost of your telephone service today. For the future, it promises the benefits of bonding widely disparate metals and all sorts of other materials.

**You Can Take It For Granted.**

Most important, explosive bonds are contributing to the clarity of communications, the reliability of switching, the taken-for-granted assurance you have when you reach for your telephone.

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