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MODIFICATION OF SEC 3000 BONDER FOR
ELECTRONIC FLAME-OFF

By D. D. Schroeder
A. O. Bendure, Project Leader

Published November 1977

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**Kansas City
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MODIFICATION OF SEC 3000 BONDER FOR ELECTRONIC FLAME-OFF

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By D. D. Schroeder

Modifications described allow replacement of the standard hydrogen flame-off unit with an electronic unit which increases safety, eliminates expensive equipment, and increases consistency of operation.

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A prime contractor with the United States Department of Energy under Contract Number EY-76-C-04-0613

DISCUSSION

A SEC 3000* thermocompression gold ball bonder can be modified to use a K & S 961-3** electronic flame-off unit to replace the hydrogen flame-off unit. The electronic unit is safer because it eliminates the need for hydrogen gas, which eliminates the need for expensive explosion proof ventilation hoods, special hydrogen piping, and hydrogen leak detection equipment.

The original logic sequence of the SEC 3000 bonder is:

1. Home position, clamp open
2. First search position, clamp open
3. First bond position, clamp open
4. Traverse position, clamp open
5. Second search position, clamp open
6. Second bond position, clamp open
7. Clamp closes while moving to flame-off position
8. Flame-off actuator, clamp closed
9. Cycle repeats

To modify the bonder, the logic sequence must be changed to:

1. Home position, clamp closed
2. First search position, clamp open
3. First bond position, clamp open
4. Traverse position, clamp open
5. Second search position, clamp open
6. Second bond position, clamp open
7. Flame-off position, clamp open
8. Clamp closes while bonder tip is stopped
9. Home position, clamp closed
10. Flame-off actuator, clamp closed
11. Cycle repeats

Figure 1 indicates the modifications required.

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Newbury Park, Ca. 91320

**Kulicke & Soffa Industries Corp.
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Horsham, Pa. 19044

Figure 1. Parts Added To Edge Connectors To Complete Bonder Modification.

By having the bonder go to the flame-off position before it closes the clamp, a consistent wire length is left below the tip when the bonder breaks the wire by going to the home position. A more uniform ball size and shape results when the flame-off actuator forms the ball in the home position. Since the clamp remains closed in the home position, the wire is not lost if a ball fails to be formed. In the original system the clamp closes with the tip in motion and an unaccurate "tail" length is left below the tip. This results in an inconsistent ball size and shape.

The machine operates only a few seconds slower per bond and the time lost is made up for in improved ball size and shape.

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