October 1969

Brief 69-10393

# NASA TECH BRIEF



## Conversion of Continuous-Direct-Current TIG Welder to Pulse-Arc Operation

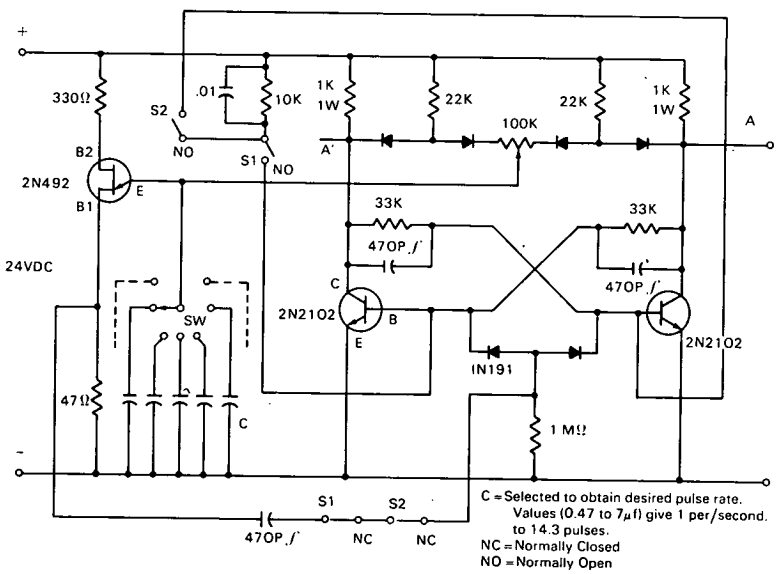


Fig. 1. Pulse Circuit

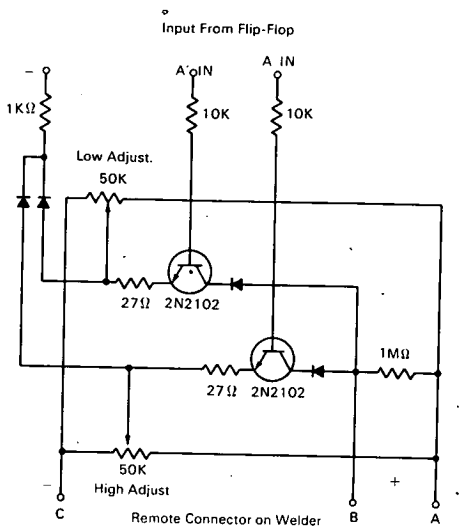


Fig. 2. High-Low Current Control

### The problem:

To convert a continuous-dc TIG (tungsten–inert gas) welder for pulse-arc operation.

### The solution:

Addition of an electronics package without which the machine can continue to function in its original mode. The package allows presetting of the pulse rate, duty cycle, and current value, and enables welding of various alloys and thicknesses of materials. (See figs. 1 - 3.)

Pulse-arc welding gives better control of penetration by the weld, minimizes the shrinkage effect of great heat, and helps to reduce porosity of the weld.

### Notes:

1. Normally, pulsed-arc equipment must be purchased as a separate unit, and an existing continuous unit cannot be modified for pulsed modes. Pulsed-arc TIG welding provides advantages over conventional TIG welding for out-of-position welds and for thin metals. This information may be of general interest to all welding fabricators.
2. No further documentation is available. Inquiries may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B69-10393

(continued overleaf)

**Patent Status:**

No patent action is contemplated by NASA.

Source: D. R. Lien of
North American Rockwell Corporation
under contract to
Marshall Space Flight Center
(MFS-16411)

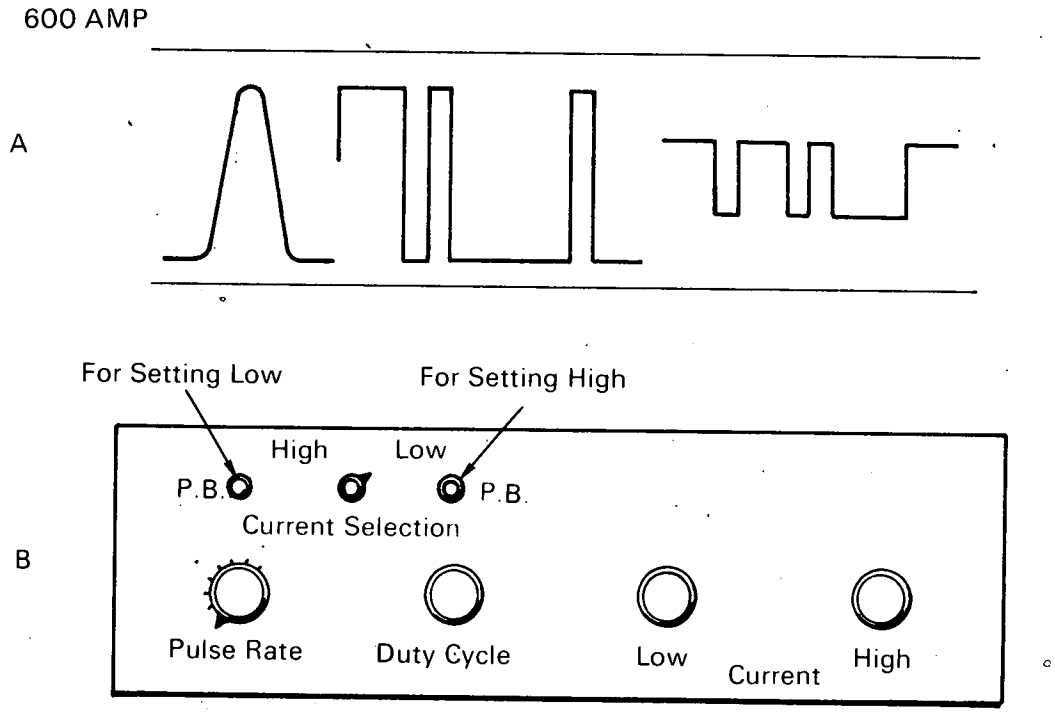


Fig. 3. Examples of Pulse forms at Different Current Values (A), and the Control Panel of the Package (B)