

Specifications: Model 7440D Series Insulated Wire Bonders, Manual X-Y-Z

Last Revised: 09/19/18 - microscope

The machines of West-Bond's Model 7440D Series are dedicated ultrasonic wire bonders for interconnecting insulated, gold plated, copper wire to thin film sliders or Flex-Circuits of Computer Disk Drives, or for other similar insulated wire connection applications.

These machines bond insulated wires of 0.7 to 2.0 mils diameter directly to thin film gold without the need to first strip off the insulation. This is accomplished by a specially designed wedge tool applied with programmed ultrasonic energy, force, and time, to soften and disperse insulation, then to bond the exposed wire to the work piece metallization. West-Bond's unique single lever X-Y-Z micromanipulator makes it possible to use this process for bonding disk sliders by enabling the operator to engage a free standing end of a twisted pair wire in mid air and direct that end to touch down on the work piece at the bond target, all under microscope observation. The machine senses touchdown to initiate the bond program.

It is the first series of the West-Bond line to embody the new three axis mechanical-advantage manipulator which is independently guided along each axis, and so is able to transmit motion and force from control to tool undisturbed by loading forces from any other direction. For operation in a horizontal plane, the pantograph mechanism is counterbalanced by weight, and the tool assembly is counterbalanced by an adjustable spring. The force to move the control in each direction is just perceptible -- about 25 grams -- and the control will stay where left throughout nearly all of its three dimensional range. Mechanical advantage is 8:1 and the tool range is 5/8 inch in all axes. No other ratio of mechanical advantage is available for this series. The table surface should be available to serve as forearm rest to derive control precision from movement within the hand. As a gauge for proper installation, the microscope eyepieces should be positioned not forward of the table edge.

Series designation is changed from C-series to D-Series to implement inclusion of the modified Y-Slide member with longer Vee-ways.

A new feature made possible by this design is the ability to brake each axis independently by machine control when desired; in this case, during the ultrasonic bond time. This is especially advantageous in Insulated Wire Bonding where an initial time is required to melt the insulation.

The Bond force is applied by spring counterbalance adjustable through a range of 25 to 300 grams. Wire feed mechanism is omitted, as wire is positioned manually by the operator. Throat reach is 5.125 in. from tool home position back to the machine lower panel. The ultrasonic transducer is K~Sine Model 20-W, 1½ wave length, operating at a nominal frequency of 63 kHz. The built in ultrasonic power supply is K~Sine Part No. 7086, five Watts.

Controls on the machine panel include:

- Digital potentiometers to adjust ultrasonic power and time.
- A test switch and indicator light to verify that the transducer is operating in resonance.
- An LCD display to show the count of bonds done by this tool for the purpose of changing tools within the wear limit
- Selector switch to enable or silence the beeper. When enabled, the beeper is on for the duration of the ultrasonic pulse.
- On-off power switch.

The microscope recommended for this model is either the Olympus SZ51- with the "Luxuray" LED illuminator #10265. Neither microscope nor illuminator is included. One bonding wedge tool is included.

Definitions of Models of the Insulated Wire Bonder Series:

- **Model No. 7440D.** This machine described herein.
- **Model No. 7445D.** This machine with K~21-W Ultrasonic Transducer, Part No. 6870, and Power Supply, Part No. 8347, capable of delivering 20 watts and with force range increased to 2 pounds for bonding of Insulated Wire up to 6 mils, or 34 Gauge, in diameter. Ultrasonic energy is delivered as two pulses, each having individual control of power and time. Bond counter is eliminated.

Features available for this Series:

- **Feature No. 79.** Adjustable height work platform.

No work holder is supplied as work piece fixturing is normally done by the user. For information for this purpose, the distance from the platform to the work elevation is 2.6875". The work platform is a bolt-on assembly.

Compressed air, regulated to 50 psig, is required. Connection is via 1/4-inch tubing.

Electrical service required is either 115 or 230 VAC, 50-60 Hz, 2 Amps and compressed air at 50 psi minimum to activate the axis locks.

Machine size is 18" deep X 19" wide X 12" high, exclusive of microscope, or 18" in height to scope eyepieces. Weight is 60 pounds uncrated, or 115 pounds accessorized and crated.