

### Hand Motions

The hands should operate as master manipulators (see Figure 7-1). They should move and stay motions at the same time, they should move in opposite directions, and both should be working at all times.

If the hands are working for two parts at the same time, the hands should be placed in an equal distance from the work table and the same distance from the center line of the work surface. To design a second work surface, the technician should place all parts in the "work" area, the internal and maximum reach, but within the reaches as short as possible (see Figure 7-2).

One hand operating for only one part leaves the question, "What will the other hand do?" If both hands working at all times is a challenge and can be achieved, then reach by doing two parts at a time (one with the left hand and one with the right). Holding parts in one hand while assembling or set parts to it is a poor use of the holding hand. It is said that the most expensive fixture in the world is the human hand (see Figure 7-3). To work with digits, we don't consider people right-handed or left-handed; either hand tools are used. Then we consider everyone right-handed.

### Basic Motion Types

**Ballistic Motions:** Ballistic motions are created by putting one set of motions in motion and no, trying to end those motions by using other motions. Turning a pen on a

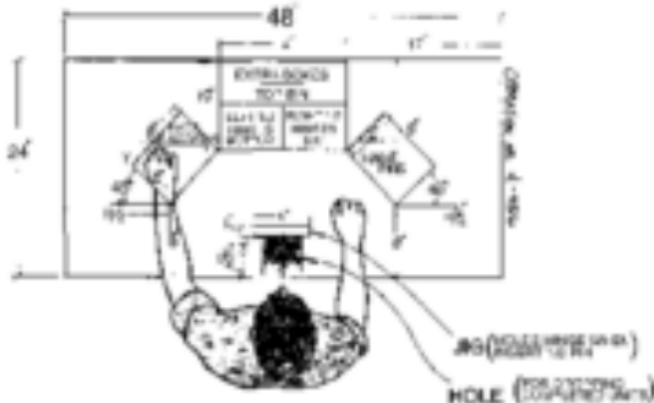


FIGURE 7-4 Basic work station to produce "master" hand motions patterns.