# Creating a Complete Tooling Package

The submittal of a Complete Tooling Package ensures your PCB supplier provides you with quality product that is shipped on-time. The tooling package is made up of the following:

**Company Specifications:** It is importaint that your new supplier has a copy of your company's approved workmanship standard or specification which should accompany the first order placed. More importantly, make sure that your vendor receives subsequent revisions to ensure they are always current with your standards.

**Fabrication Notes:** Material type to be used, the finished thickness, layer count, metal finish, the solder-mask color, legend and route specifications among other items are mentioned in this list describing how the PCB is supposed to be manufactured.

**Gerber Data:** A type of electronic data that consists of graphic commands, usually describing how to draw a picture of a circuit. Intended for directing a photoplotter, it is the most common format for data transfer from PCB CAD systems to the manufacturing process. Gerber data is officially designated as RS-274-D (without embedded aperture codes) and RS-272-X (with embedded aperture codes).

**Aperture List:** A list of codes used to plot the Gerber data each having a designation allowing for shapes of different sizes like a square, rectangle, flash, draw, etc. to be drawn.

**Drill File and Location:** A list of drill sizes and coordinates for the drilling of the PCB.

**Read Me File:** A text file detailing your company name, contact information, engineer or designer's name, name of the Gerber file, the aperture list and drill file to be used in the manufacture of the particular part number. Any information pertaining to the particular part number may be referenced as well in this message.

Once your supplier's engineering department receives the tooling package, the assigned engineer will begin processing the order. Design factors and the manufacturing capability of the PCB supplier are considered when the job traveler is prepared. The traveler is a procedural sheet specific for that particular part number detailing what procedure a technician shall follow in each individual operation. The traveler begins with the cutting of material, to detailing the way the order is to be shipped. It is an intended written procedure to ensure each operation is performed exactly the same way each and every time.

The engineering department is also responsible for the programming electrical test fixture and its manufacture.

It is the responsibility of the engineer to communicate with the production department to make sure that the quality product will ship on time. There are many areas not metioned above that must be reviewed by the engineering department. The more time spent in up-front engineering the better the order will run through the process with a lesser chance of failure. Don't be surprised or upset when your supplier's engineer is asking questions to clarify what is desired-- the number of questions asked is proportional to the quality received.