



Dinosaurs, PWBs and Survival

As *CircuitTree* celebrates its tenth year of growth and success, I thought it would be a good time to look at the history and future of another publishing entity near and dear to our industry, the U.S. military. The military has a long history of publishing standards and specifications for our industry. In stark contrast to *CircuitTree's* continued growth over the last ten years, the military's publishing power in the electronics industry has steadily diminished to a point where its survival is in question.

T-Rex and Friends

In the days when military specifications were becoming dominant, roaming the earth in search of who next to devour, demand for leading edge electronics for the military far outstripped our industry's ability to supply them product. Created by this demand, manufacturers arose who did not feel the burden most do today of supplying a world-class product with or without the presence of a specification. The quality of the delivered product waned, and the military's need for rigidly controlled specifications and product requirements was genuine. Efforts to create these specifications received top priority, and no one built or bought anything without the Mil Specs. It was at this point when these T-Rex specifications seemed like they would forever dominate the future of our industry. It has now become obvious that natural selection has once again made its choice and the pendulum has begun its journey away from one extreme toward the other.

The Mil Specs we use are undergoing extinction the likes of which we haven't seen since the dinosaurs departed a few years ago (okay, many years ago). These

specifications are not even being given a decent military funeral, but are being slowly tortured or executed as treasonous, despite their faithful duty and service over the years. The only thing these specifications are guilty of is stagnation and misuse. These well intended specifications were very applicable during an important time in our industry's history. Unfortunately, they failed to change with the times and are now consequently facing extinction.

How Did This Happen?

As often occurs in large organizations like the government, the people placed in charge of maintaining the viability and health of these specifications were not the technical experts of our industry, but people who were "experts" at writing specifications. To their credit, they did seek our help in the form of "Blue Ribbon" committees and industry "Roundtables," but their specification updating efforts were too often initiated as a "re"-action rather than "pro"-action. Amendments and revisions typically found their origins in response to per-

MIL-P-55110: Rigid PWBs
Revision Level: MIL-PRF-55110 F
Status: Inactivated for new designs
December 31, 1997

ceived problems and loopholes discovered, rather than from efforts to keep the specifications up-to-date with technology and current manufacturing trends.

As an industry, we are responsible as well. We did not offer any real alternatives to the Mil-Specs, and for many years we wrote our commercial industry specifications as carbon copies of the Mil-Specs in order to placate the "military establishment," instead of serving the electronics interconnection industry as a whole. Over the last several years, industry efforts have focused on changing this philosophy in an effort to chart a better future, and I hope (as IPC's Rigid PWB and HDI chairman) that we have been in time to avert disaster. If we, as an industry, do not provide viable specifications for the procurement of our industry's products, a specification "free-for-all" will ensue, with each customer imposing their internally written specifications on us. These internal specifications historically contain many of the same flaws that the (endangered species) Mil Specs do, as they are typically reactive, and written in response to real or perceived problems that have been experienced by the company. The return to this type of a situation could be costly and destructive to our industry. Industry coordination and consensus specifications are the only way to avoid this type of widespread disaster. Specifications written and maintained with the needs of the entire industry in mind have been, and will be welcomed and used throughout industry. The new IPC 4100 and 6010 series of documents are excellent examples of a pro-active effort to meet the needs of the industry today and in the future.



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Of Days and Dollars

As the “day late, dollar short” saying goes, the new thinking of the military has come at a stage when their influence on the market is waning. Instead of remaining technological leaders of the electronics interconnection industry, their specifications have historically bogged down new technology and development to a point where technology found in the commercial sector today is now considered “state of the art.” Despite a name change (DESC to DSCC), a genuine facelift, and a group of individuals who are valiantly doing their best to change their fate, I believe that it all comes a day late and many dollars short. The current group “in charge” at the Defense Supply Center Columbus (DSCC) realized their predecessors lack of foresight, and recently began an effort to effect positive change. Their new specification, MIL-PRF-31032, is a reasonably well written document which attempts to address the stagnation and technological suppression historically attributed to military specifications. Although it may have come a little late for this cycle, in the long run when the pendulum swings back (and it will swing back), this specification could be the most progressive and useful thing we have seen come out of the military establishment in a long time. I hope they have the patience and budget to continue their work in this area because a time

MIL-P-50884: Flexible PWBs
Revision Level: C, Amendment 4
Status: Sadly, Alive & Well

will come when their efforts will be required and appreciated.

Fossils and Jurassic Park

Our industry is cyclic, and everyone who has been around long enough has seen the pendulum swing back and forth. The pendulum of regulation and de-regulation using specs and standards is now swinging back toward de-regulation. De-regulation has distinct market benefits, but lest we forget, regulation is the result of de-regulation gone bad. The pendulum will swing back toward regulation sooner or later. I believe that it is in our best interest as an industry to keep the pendulum from reaching an extreme at either end. The momentum developed by one extreme always gets transferred into a backlash the other way. As we saw in that Spielberg film, old fossils (specifications) have a way of getting dug up and revived if necessary. Let's not give them a reason to go digging! Military PWB standardization dates back to before MIL-P-55110. How many of you remember MIL-P-55640 which was the precursor to MIL-P-55110? In the beginning, a small group of dedicated individuals got together and

MIL-S-13949: Laminate Materials
Revision Level: H, Amendment 1
Status: Inactivated for new designs
December 31, 1997

Possible Cancellation soon. For a description see "IPC Technical Review" by David Bergman in the September '97 issue of CircuitTree.

formed the “Blue Ribbon” committee which wrote the original MIL-P-55110. Since that time, the specification has evolved through many revisions and amendments. For many years, this standard represented the “state of the art” in PWB acceptance criteria. If you wanted a good PWB, you called out MIL-P-55110 on your drawing. The basic premise of the specification was to build it to the best of your ability, and test the hell out of it to prove you really did a good job.

When I look at the “dinosaur age” survival quality of MIL-P-50884, I think of our friend the cockroach. Now those of you that build and buy flexible PWBs make take some offense to that analogy, but hear me out before you cast stones. It was one of the only survivors left from prehistoric days. It causes problems galore. People mostly ignore its existence. We wish it were gone, but have been unable to exterminate it despite valiant efforts over the years.

I still cannot understand how MIL-P-50884 survives today as it is virtually impossible to build compliant product to, completely. The requirements are outdated, and it has seen none of the activity, cancellation or otherwise, that the other industry specifications (facing extinction) have...survival again!