AUTOMATING ON A SHOESTRING BUDGET.

By: Matt Miller

Simple automated equipment is the logical choice to tap into many cost savings. The trend in the industry right, especially in automotive, now is towards robotics and modular automation. This type of sophisticated equipment is out of reach for many small and medium manufacturers. Modest home brewed automated equipment that takes the direct labor out of the balance sheet is not out of the question, however. The key is to look for tasks that can be automated and break those tasks into their basic elements. Once this is done it can be determined if the job can be done by a simple piece of automated equipment.

Most small shops do not have an electrical engineer to design the control, motion or sensor portion of an automated device. Most simple tasks that are candidates for automation are left in the hands of direct labor. The benefits of automating many tasks are not enough to justify the cost of contracting an engineering firm or hiring an engineer to build the system. The desire of many mechanical experts to make an automated piece of equipment is high, I this know from the volume of inquiries from the microcontrollers and sensors series. I will be devoting the remainder of this year on the evaluation of equipment that will allow the mechanical guy to cross over into the electrical domain. I have started with the Basic Stamp and sensors. Next we'll go into the various types of motion control. Over the next few issues we'll look at as much as we can in the form of tools and strategies for basic automation. I will include experiments at my new website: www.housebrandplc.com. Those interested in looking to find inexpensive ways to automating a simple process or make something work faster or safer can find answers starting next month in American Tool, Die and Stamping News and periodic updates on the new website. It's database, will grow as information is added.

Where can automation find its way into a small or medium shop? Way back in 1978 I went to visit my neighbor who worked on the 78th floor of the Sears Tower. As I was given the nickel tour, a robot maneuvered the aisles on that floor from the elevator to deliver mail. It made its way through the entire floor and then back onto the elevator to either the next floor or to replenish its stock and move on. Wow, I thought, how cool is that? A robot delivering the mail and riding the elevator to do it! Now I look back and think, that probably saved quite a bit of money and time. Look at your plant as though every job can be done or helped with a piece of automated equipment. Once you have evaluated and found some candidates break them down into the individual elements that make up that task. If you have the mechanically savvy workers that can design a system to perform the task, then look into building it. You will learn much on the way. Choose the pesky but simplest task for the first project. If you can design the mechanical system that you feel will work, the next few issues and the website will show you that there are simple, low cost products that will allow you to bring your design to life.

There are some things to remember when you are reading through design magazines and other trade magazines for ideas. First of all remember that marketing is alive and well in those publications as well. Precision and accuracy is relative. Quality is relative as well. Don't buy into the hype that if it isn't the most accurate and most powerful or what ever it isn't good enough. This is not to say that the claims of the ads are not true or unnecessary, I am merely making the point that in many cases the best is simply too much. For many automated projects and most if not all simple ones lower rung, lower cost products are the logical choice. The next issue will look at motion control. We will use a simple brushed dc motor with a simple 500 count per revolution encoder coupled with the Basic Stamp, a motor controller from Solutions Cubed and a power supply to make something move quickly and pretty darned accurately. The best part of it is, it'll be for less than $300.00 including the motor. Motion control is probably the most complicated aspect of automation, so the articles will spend a fair amount of time defining the terms and need to know aspects of designing a motion system.

There is a wealth of information in the Internet and of course many libraries on motion control. If you are serious about learning how to build simple automated systems that include motion control, be sure to do some reading on your own. Once you have the basics, it will all become much clearer to you. You will see how much you really don't know and where you need to learn more. Once again, though don't be intimidated by the terms or the equipment.

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