Are you new to machine control? Don’t be embarrassed, we all have to start somewhere. Shoot, the first time I heard about the opportunity to build models for machine control I figured it would be for factory equipment being moved precisely around on the shop floor. There is no reason that anyone should not have an all-around positive first job experience with machine control and GPS. I help with that every day at work and want to help here with that. Every time we get a customer who’s new to machine control, there are a number of general questions we answer about what they will need and what they will not need. With that in mind, I wanted to kick off a new series of articles in Machine Control Online that help prevent the New to Machine Control Woes.

Co-Op Not Deathmatch
First things first, we are all on the same team. Whether you’re the owner, engineer, contractor, data builder, dealer, surveyor or operator we are all interested in getting the project built correctly, safely and on-time. There should never be an ‘us versus them’ attitude. Sure there are going to be issues that need to be resolved, and conflicts that arise between various people on every project, but that’s part of life and part of construction. Machine control is not something that is just going to magically run smoothly in the field. It takes quality work and effort from all involved. This will equally apply to your first project with machine control as it will your 100th.

Machine, Operator, Model
The first thing anyone new to machine control needs to understand is that as pointed out above, machine control is not going to go out into the field and magically start to work perfectly. The best machine control experience is only going to occur when the machine, operator and model all work together correctly. No matter how big or how small, or what type of project you are using, this statement will hold true. Each of these three components must be at their best—if anyone one slackens, the whole experience will quickly sour.

Machine: No One Likes Quiet Iron
Let’s start with the machine as this is where your GPS machine control experience will start. More than most likely your company has been doing construction and grading by traditional methods for years: surveyors using total stations to set stakes/hubs/bluetops that your operators grade by. Now your company has purchased its first grader equipped with machine control. Hurray!—but what now? Your new best friend is your dealer. Whatever brand you bought and whoever you bought it from is going to be best, first resource into the world of machine control. They will help get your equipment all setup, troubleshoot any hardware issues and
make sure it is always running properly. Listen to them and stay on their good side: dealers are probably the single best resource for all machine control users.

**Bubba The Grader**

That brings us to Bubba the grader. Bubba has worked with your company for years and is the best grader you have. He's good, he's efficient and he has a great name. But now he finds out that he is going to be grading with machine control. Your machine could be running at 100%, perfectly calibrated and localized, but if Bubba doesn't know how to use it correctly you might as well go back to the way things were because all that fantsy-pants machine control is not doing a bit of good if he doesn't know what to do with it. The best part about machine control is that you can take all the skills Bubba has to offer and make them even better. But, that doesn't happen by magic. It happens with education and training. Bubba's best resource is going to be your dealer to get that education and training. If your dealer is not offering these resources, they will be available through the manufacture of your GPS and other locations. Regardless of where Bubba gets his training and education, he needs it.

**Model, The Red-Headed Stepchild Of Machine Control**

That brings us to the last part of a good machine control experience: the model. Companies are very interested, and will spend great sums of money on the first two components above: the machine and the operator. If either of these are failing to perform, someone's vocabulary gets expanded from a red-in-the-face project manager. Which is not surprising, it's very obvious when either is failing to meet your expectations because your expectations are clear for both the machine and operator. But what about the model? What are your expectations for the model? You could have a perfectly operating machine with the world's best grader, but if someone spent five minutes building your model then you might as well take all that fantsy-pants machine control equipment off your grader because it's doing you no good.

Put simply, if your model stinks, your machine control experience will stink. While this may be clear here in writing, my experience has been that no small number, perhaps even the majority, of machine control users don't know the difference between good data and bad data. There almost seems to be a shrug of the shoulders while saying 'oh, it's just a model—just convert the contours.' A machine control model, or data, or surface, or linework, or the 'file' or whatever else you want to call it can make or break your experience in the field. It's just as important as your machine and just as important as the operator. If any of these fail, including the model, then your machine control experience will fail.

**Ok, So The Models Important, Where To Start?**

So if your machine control experience is going to be directly proportional to the time and skill someone puts into your model, where do you go for your model? Some dealers will give you your first model for free as part of your purchase, but that's pretty rare and not a long-term solution. No matter what type of project you are building, you have three basic choices for getting your model: the engineer, in-house, 3rd party. There are benefits and risks associated with each of these choices, so let's briefly explore each to help you with your decision.

**Didn't The Engineer Give Us A Model?**

With just about every civil engineering project these days the engineer is going to provide a number of electronic files to
you when you are awarded the project, or even during the bidding process. There will almost certainly be the construction plans, specs and reports in electronic format and then a plethora of files that you don’t recognize. These files are exports out of the design software the engineer used in the design process. They will most likely be a .dwg (AutoCAD) or .dgn (Microstation) file, but even both of these software’s will also spit out an innumerable host of other file types. There is an understandable tendency for a project manager to see all these files and say ‘Great, I have my model!’ Well, there are a couple of realities you need to understand with all these files.

Remember that release form you signed to get these files from the engineer? Read it closely. It says that these files are for your use, and that you assume all responsibility and liability for their use or misuse and if anything is wrong with them, it’s your fault. This is not a rub against engineers. The engineers responsibility is *not* a machine control model, it is the site design and the construction plans. The owner hired them for this purpose, and their files were built with this, and only this, purpose in mind. The greatest strength of getting the model from the engineer is that it’s free, and it’s immediately available. However, this comes at a steep price: it’s unknown, potentially incomplete and entirely your risk to use it.

**Well, What About Jimmy Our Estimator?**

So if accepting all that liability blindly isn’t your cup of tea, your search for a model will most likely next take you to Jimmy, your estimator. He does your take-off’s, he has CAD and he sits in front of a computer all day. Whether or not this will work is going to depend a lot on who Jimmy is and what resources he has available to him. He’s a sharp field guy with engineering experience who has a full version of a design software and knows how to use it, then you have found your model solution—not just a solution, but a really valuable employee! It will only be a matter of him finding time to do it because he has other responsibilities. But if Jimmy has no field experience, no engineering experience, a limited or free version of a design software and no time, then he is going to be very limited in what he can do for you. Sure, he will be able to put together ‘something’ but I am willing to bet dollars to pesos that it going to be incomplete, incorrect and unclear in the field. You want your data to be clear, complete and correct. So whether you can build it in house or not is entirely based on whom you have in house, how much time they have and the resources they have available to them. My own personal observation is that most companies are starting to go this route and have someone in-house build their machine control files. A big strength to this is that they are in-house and already being paid for—and you can stand over their shoulder to remind them you need your file right away! Weakness can be that they are entirely unqualified to be building a surface, or lack the proper tools.
to do so, or they might have the skills and the right tools, but are so over-taxed in other responsibilities that the model ends up being rushed. And incase it’s not clear, you don’t want a rushed model.

### What About That Company, Don’t They Do That?

Your final resource is a 3rd party. This can vary wildly from your buddy Bill working out of his moms basement to professional companies working out of their own basements. The advantage to a 3rd party is building models is what they specialize in and have experience in. Some companies that will build you a model do other things and provide other services also, while other companies will only build models fall under this category, I fully admit that this is not always the best option. But again, that depends entirely on who you have in-house, the resources available to them and how complex the job is.

### Your First Step Into Machine Control

In all the horror stories of bad machine control experience I have heard, it is never the machine or operator who is the problem. It’s the model. The machine can be fixed, the operator trained, but who's building your model and the amount of time they spend on it will largely determine your experience in the field. In my next article we will discuss what you will need to get to whoever is building your model and what file types you can expect in return. In the following articles, we will discuss each general type of project and what you will need to build them correctly. But for now, if you are new to machine control, welcome! While you’re here, make sure your machine is happy, Bubba gets his training, and whoever is building your model in their basement knows what they are doing.

"The best machine control experience is only going to occur when the machine, operator and model all work together correctly."

The biggest potential disadvantage to a 3rd party is cost—someone’s got to pay for the high-speed internet to the basement. While I

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