Estimates, Jobs, Setup Quantities and Quantity to Manufacture – Oh My!

A look at how production works in the Realtrac Performance ERP System.
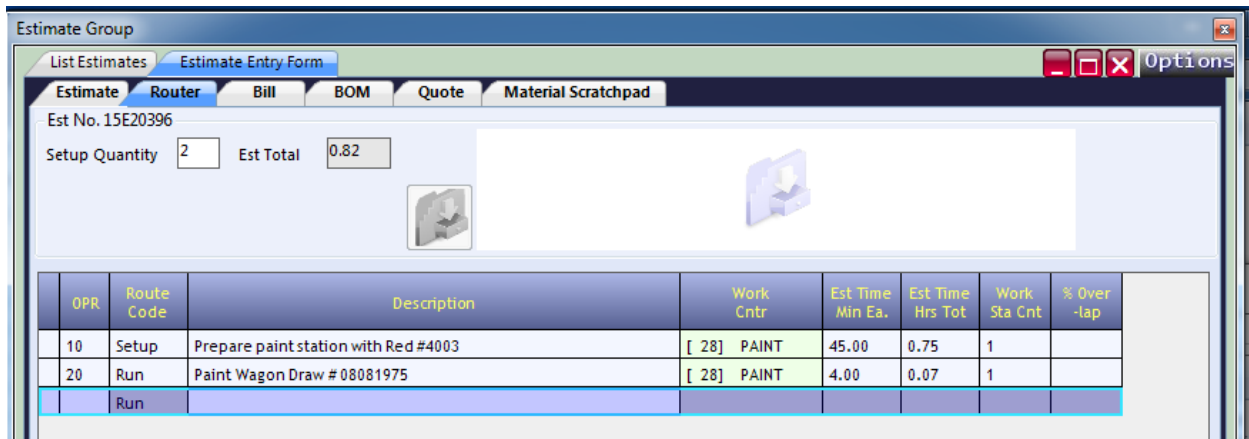
Realtrac Performance ERP

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Estimate

We begin our journey with an estimate. Some Realtrac users may not have the Realtrac Estimate module, but for most of our customers, the lifecycle of a job begins in the estimate stage.

An estimate, just like a job, has a router attached to it. The router is designed to indicate the steps required to manufacture the part. It's important to understand that as we're designing the router for an estimate, the system does not know how many pieces of the part you wish to manufacture. The Realtrac user may already know exactly the number of units the order will be for, but the estimating module is written such that the router is designed to be universal.

When entering in to the quoting stage of the estimate process, the user may provide up to 10 different quantities, at which point Realtrac will do the math, extrapolating the various router operations to determine the total number of hours required for each operation based on the various quote quantities. Let's take a look at a simple router as an example.

OPR	Route Code	Description	Work Cntr	Est Time Min Ea.	Est Time Hrs Tot	Work Sta Cnt	% Over -lap
10	Setup	Prepare paint station with Red #4003	[28] PAINT	45.00	0.75	1	
20	Run	Paint Wagon Draw # 08081975	[28] PAINT	4.00	0.07	1	
	Run						

Est No. 15E20396 — Setup Quantity 2 — Est Total 0.82

Figure 1

In Figure 1, we see a simple router designed to paint a semi-finished wagon body. In operation #10, we are expecting our employee to set up a work station in the PAINT work center, and then in operation #20 they will commence with the painting process.

Operation #10 has a route code of **Setup**. The **Setup** router code, like **Fixture**, **Program** and **Other** is considered a fixed time. In other words, the time associated with this operation does not scale depending on the number of pieces that the job produces. Whether we are making 10 pieces or 1000,

the amount of time it takes to set up the work station(s) will be the same. Alternative, when we promote this estimate to a job, router operations with route codes of **Run** and **Count** will automatically scale based on the Quantity to Manufacture of the job. (We will discuss this more as we produce a quote for this estimate, and finally promote this estimate to a real job within Realtrac.)

Near the top of the router, note that the user has input a Setup Quantity of 2 units. This means that the Realtrac user programming this router is expecting that the employee should complete 2 units during the SETUP operation (operation #10) before beginning the **Run** operation (operation #20). (Again, we'll discuss how the impact of the Setup Quantity on our quote and final job momentarily.)

This interface screen also has an Estimate Total value at the top. This value may or may not be meaningful, depending on the router and the number of units the quote and job will produce. This Estimate Total would be correct if the final job is for only 1 unit. Otherwise, as we produce more than 1 unit, the time associated with **Run** and **Count** operations will be multiplied by the number of units we produce, thus raising the actual amount of time required.

Quote

For our example, let's make a simple quote where we our customer is interested in a delivery of 100 units.

Figure 2

As shown in Figure 2 above, the Realtrac system calculates you can complete this work within a week, the work will cost us $2.818 per unit (this sample Realtrac system is set to work with 3 decimal places) and with a 10% markup on our labor, we should sell each unit for $3.100.

We'll show the math more concretely when we promote this estimate to a job, but as a rough overview, in calculating the total costs and time to produce the job, the costs were calculated as follows:

1. Operation #10 – (.75 hour * PAINT Work Center hourly rate) (Note: **Setup** route codes indicate the operation is a fixed time)

2. Operation #20 – (0.07 hour * 98 units * PAINT Work Center hourly rate) (Note: Via the Setup Quantity value (See Figure 1), we indicated to Realtrac that it was expected that 2 units would be produced during the Setup phase. Therefore Realtrac expects that 98 units will need to be produced during the Run operation.)

Job Phase

Assuming our quote is accepted by our customer, the Realtrac user is going to promote the estimate in question to a job. This is done by pressing the Create Job from Estimate button on the Realtrac estimate in question.

Let's take a look at the router associated with my new job.

Figure 3

After promotion, operation #10 remains as a 45 minute, or .75 Hour operation. Realtrac knows the **Setup** Route Code means this operation has a fixed time cost associated with it.

Realtrac has done the math on the total amount of time required for operation #20 now that we have promoted our estimate to a job. In both our original estimates router (see Figure 1) and our jobs router, we have estimated the **Run** paint operation to take 4 minutes per unit.

> 4 minutes per unit * 98 units == 392 minutes

392 minutes works out to 6.53 hours, as we see in the Estimated Time Total Hours column in Figure 3 above.

Advanced Needs

Not all estimates and jobs will be this simple and straightforward. For example, let's imagine a scenario where the user is expecting that during my production of the job in our example, 5% of the parts will be scrapped (possibly intentionally due to testing or outside services, or due to a new process we are testing, the reasons are irrelevant).

How can this cost be factored in to both our estimate and the final production job?

While it would be simple to change the quote to 105 pieces to make sure the scrap costs are calculated and captured, the user doesn't want to present a quote to their customer for 105 units, only the 100 that are expected for delivery.

One approach is to build these costs in to our original estimate via the Realtrac bill interface. Refering back to Figure 2, we know that in producing 100, without any scrap, the expected per unit cost is $2.818. 5% of this cost (signifying our expected scrap rate) is $0.141.

Let's use the bill interface to build this expected scrap cost in to our 100 units.
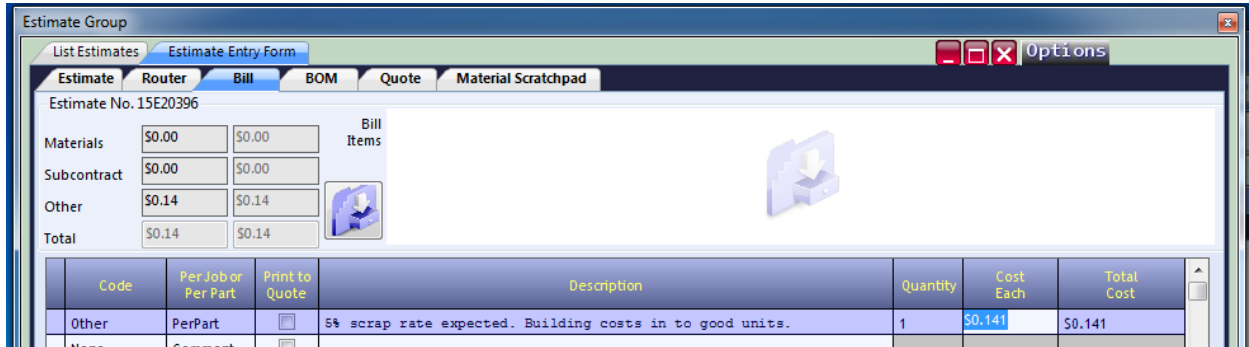

Figure 4

In Figure 4 above, the user has added a bill line indicating Per Part, included a description on the reasoning behind the cost, and included the $0.141 per part cost.

Similar to how the Run operation costs are calculated in the quote, when we produce a quote for 100 units, this value will be multiplied out and included in the total overall costs (in other words, for a quote for 100 units, Realtrac will calculate a total cost of $14.10 in scrap, and include those costs in the total cost for the job).

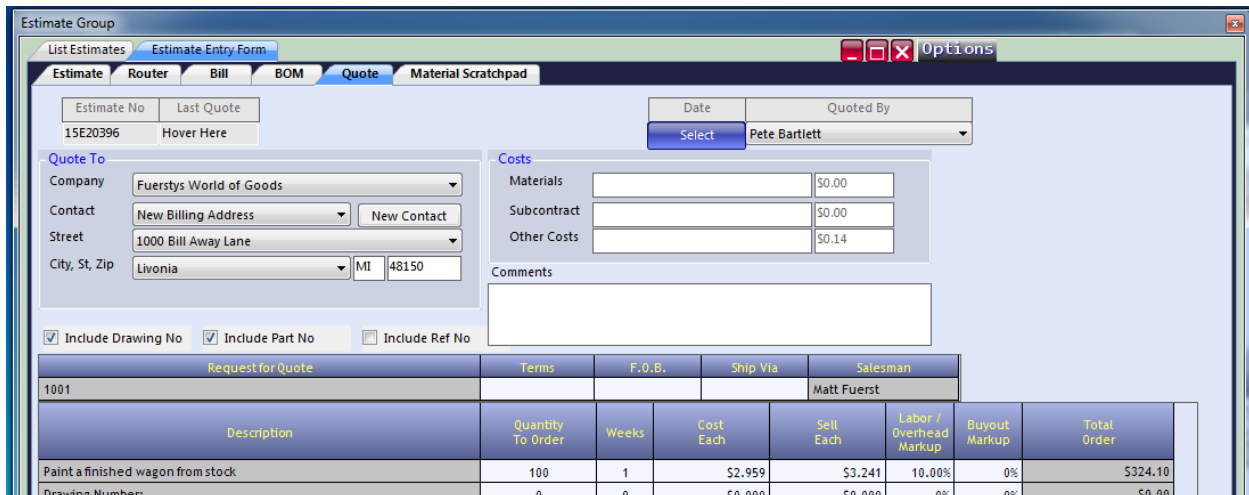Let's have Realtrac re-calculate the quote, and see how the Cost Each and Sell Each change.

Figure 5

As we see in Figure 5, our Cost Each has risen from $2.818 to $2.959, and our Sell Each has risen from $3.100 to $3.241.

We're not quite done yet, since after we promote this estimate to a job, we may wish to adjust the Quantity to Manufacture from 100 units to 105 units.
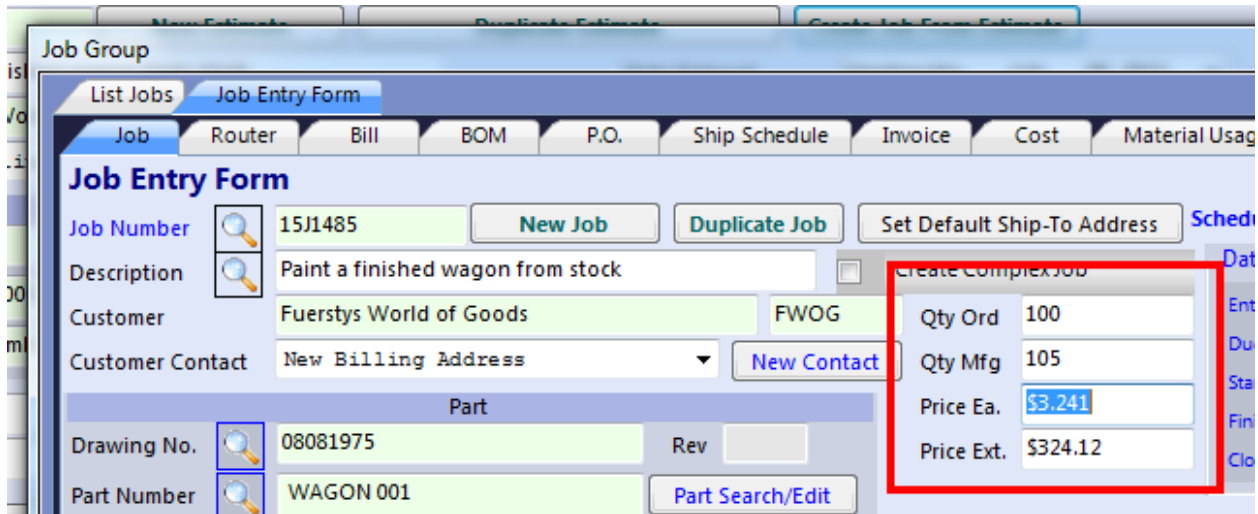
As shown in Figure 6 above, in the newly promoted job, the Quantity to Manufacture has been edited from 100 units to 105 units. This is done to update the router to note that we expect to produce 105 units (scrapping 5 along the way). This update to the router will happen automatically as soon as the Quantity to Manufacture number is updated.
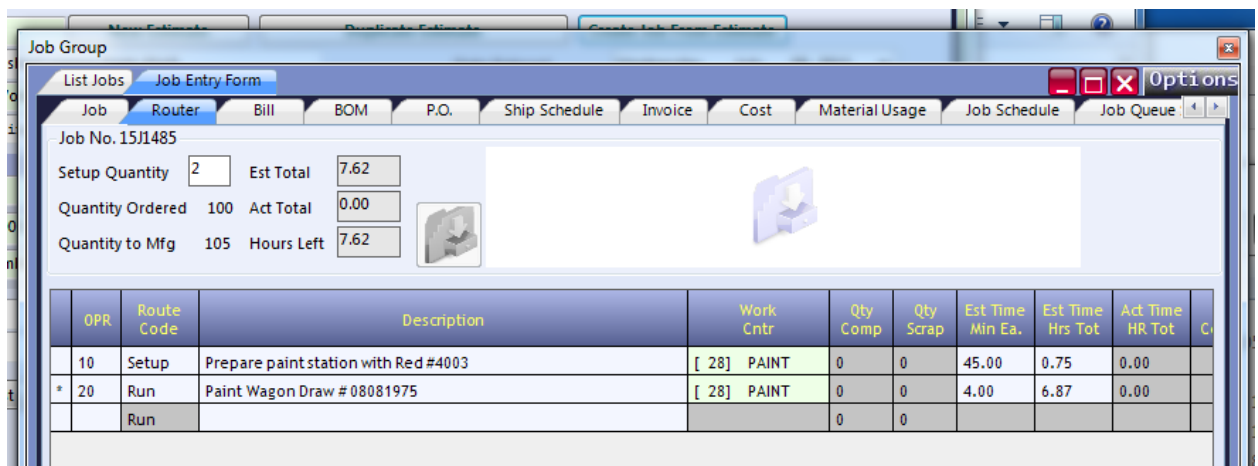
Figure 7 shows the router now updated for 105 units instead of the original 100. As expected, operation #10 still maintains the 45 minutes of labor (since **Setup** are fixed time operations) but operation #20 is now estimated at 6.87 hours.

4 minutes per unit * 103 units == 412 minutes

412 minutes / 60 minutes per hour == 6.87 hours

Compare Figure 7 (router for 105 units) to Figure 3 (router for 100 units) to confirm the changes.