SCHEDULING by Joe Stoddard

f you're running a successful building or remodeling company, chances are you've developed a scheduling system that helps you keep your jobs on track. It may be as simple as a xeroxed calendar or a dry-erase board. But if it's working, why should you consider computer scheduling? Manual whiteboards and paper lists might show you where a project is now, but computer schedulers are like a crystal ball: They show you where you're going. You'll be able to see what will happen to your completion dates as job conditions change, and you'll know what to do to get back on track. Some of the systems described here also incorporate project management features — automatic notification by fax or e-mail, budget and job-cost tracking, and the ability for project managers to interact with the schedule using PDAs or wireless pagers.

K.I.S.S.

It takes a little discipline to use computerized project scheduling, but the old excuse that "it takes a college degree in project management" isn't true. While some products have features that the typical home builder or remodeler will never need, none is more difficult to use than standard business software like Word and Excel. Greenhorn schedulers sometimes make it harder than it needs to be. Scott Dixon, a builder who created the online BuildLinks scheduler (see page 7) says, "The biggest problem we have is convincing builders a good project schedule doesn't have to be a detailed personal task list for everyone on the job. If you schedule hundreds of items, you have to maintain and track hundreds of items, and that's when builders give up." The best approach is often to schedule the big milestones, and let project managers and lead carpenters fill in the day-to-day details using whatever methods they're most comfortable with.

Using these computer schedulers is really no different than thinking through a project on paper. You select (or create) the activities that make up the project; put them in order; assign a length of time to each activity; plug in the resources necessary to complete each of the activities We compare software packages and describe the features to look for in a computerized scheduler

(people, materials, equipment); and finally distribute your schedule to whoever needs to see it.

Selecting a Scheduler

In this article, I've reviewed the schedulers in rough order from "advanced" to "simple." Simple doesn't mean bad. Some products, like VirtualBoss, are simple schedulers but have other project management capability that might make them more useful to some contractors than more complicated products. But in order to evaluate scheduling software, you need to understand a few key concepts and how each of the various products might handle them.

Project. For purposes of scheduling, a "project" is a unique, one-time endeavor that requires multiple tasks, completed in order, and has finite start and finish dates. Building a house is a project, while making a phone call is not — relationship management software like ACT! and Outlook lets you schedule tasks but are not project schedulers.

Task or activity. Tasks or activities are the individual building blocks of a project.

Dependencies. In construction, you often can't start one task until another is complete. You can't frame the house until you get the foundation done — that's a dependency.

Critical path. String all your dependent activities together starting with the first, and you've created a "critical path" or "CPM" (critical path method) schedule. If you delay any one activity along the critical path

by a day, every activity that comes after it is going to start one day later, and the finish date of the project is going to move back as well. Some advanced schedulers have tools to compare the original (baseline) schedule to the modified schedule.

Calendars. Even the simplest schedulers reviewed here have some facility for excluding weekends and holidays from your schedule. Advanced schedulers have the ability to overlay separate calendars for individual tasks and resources, such as "not available" days for a particular subcontractor, or limiting deliveries from a particular supplier to certain hours.

Task durations. The simple schedulers in this article allow you to schedule only in full-day increments. That could be a problem if you need to track one backhoe on four job sites on the same day. Advanced schedulers let you break down tasks to hours (useful) or even minutes (not a good idea).

Lead time and lag time. These are two of the most misunderstood concepts in project scheduling. Most of the products described here make at least some provision for lead and lag, but they might call them different things (float, overlap) or require you to enter them in different ways (numbers, dates).

"Lag" time is the amount of time you have to wait after one task is complete before you can start the next — for example, waiting for the concrete pad to cure properly before you can start wall framing. "Lead" time is the opposite — it's the time you need in advance of an activity to set it up. Allowing six weeks to get a set of custom cabinets is an example of required lead time.

Here's where it gets confusing: Lag times, which you would think of as negative (as in "lagging behind"), are usually expressed as *positive* numbers, while lead times could be *negative* numbers: A +2-day interval means that you have to wait two days before starting the next thing (lag), whereas a -2-day interval means that you could start two days early (lead).

Constraints. Maybe you have customers who live in Europe most of the year and will be available to lay out their whole-house audio system with your subcontractor only on two specific days in March. Or Grandma will be visiting in the third week of May, so you can't schedule your bank closing any time that week. When those kinds of limitations (constraints) exist, they override all other aspects of your schedule. Simple schedulers might let you attach a note to an activity to indicate a constraint, whereas advanced scheduling products like Microsoft Project or Primavera SureTrak actually let you bind a schedule to the constraints you set.

Resources. Resources are the "who" or "what" that are necessary to complete a task. Simple schedulers (QuickGantt, VirtualBoss) typically allow you to assign one resource per task, or possibly a resource and a budget

amount. Advanced products allow you to assign multiple resources, such as workers *and* materials *and* equipment, to be tracked along with a single activity.

Resource allocation and resource leveling. Just because you book the same electrician on eight different jobs on the same day doesn't mean she has enough employees to actually cover the projects for you. Simple schedulers don't take resource allocation or leveling into account at all — you'll be on your own to keep track of who has the goods to get the jobs done and what the impact on your schedule and budget will be.

But what if you had 100 houses in production in eight different communities? Then you'd want your scheduling software to help you out. Advanced schedulers have the ability to red-flag over-allocated resources and let you analyze whether it would be more cost effective to put more masons on the job or let the project run a week longer at the other end.

Schedule "views." All of the products in this article will show you your project information in different ways, depending on who is looking at it for what purpose. Advanced products generally offer more views than simple products. Here are the common ones:

- List view. A simple list of what needs to happen, one item after another. Simple "clipboard-friendly" lists are often the best way to distribute your schedule to your project managers and lead carpenters.
- Calendar view. Familiar to users of Outlook and ACT!, a
 calendar view places activities on a normal-looking
 calendar, especially good for presentation to your
 clients or for quick at-a-glance overviews of a project.
- Gantt chart. Named after early-20th-century management pioneer Henry L. Gantt, this is a special type of bar graph that shows not only start and finish dates but also how activities relate to each other. Some software products use a modified bar graph instead of a true Gantt chart.
- PERT diagrams. Program evaluation and review technique diagrams (also called network diagrams) depict scheduled activities and resources as a series of boxes that can be edited directly, a handy way to tweak your project during planning stages.

Notifications. If a week of freezing rain is making your framing run late, there may not be anything you can do to make up the time, but at least you'll be able to notify your project team and your customer that they'll need to start, deliver, or move in at a later date. That can mean printing, faxing, or distributing notices electronically. Some schedulers have direct e-mail and

fax capability; others can save certain views and reports as web pages; and still others have full-blown real-time collaboration capability using the Internet or a wireless handheld device.

Even if the product you select is weak in built-in electronic sharing features, you can always add a .PDF (portable document format) driver such as Adobe Acrobat and distribute your schedules and task lists electronically by "printing" them to .PDF, then e-mailing the files.

Schedule and project tracking. Electronic schedulers are designed to be updated as the project progresses. All of the products in this article will automatically recal-

culate all future activities as you enter corrections, as well as provide some visual feedback. Simpler products might change the color of a graph or diagram to let you see what has been completed, whereas advanced schedulers allow you to save the original schedule as a "baseline," then compare the modified schedule against that baseline.

Some specialized products, such as CDCI's cPM, track not only time but also money, correlating the amount of work you've completed to the amount of money you've received, to give you instant feedback on your current cash situation.

The scheduler you choose will depend on the kind of work you do, the number of projects you need to track, and other software you might want to integrate with your scheduler. I've tried to organize the products in order from most advanced to most basic, but keep in mind that even basic schedulers may have advanced project management capability. And be aware that including a product here is by no means a "recommendation": You'll still need to do your homework, try out demo and evaluation versions, and determine how any of these products might fit into your overall business plan.

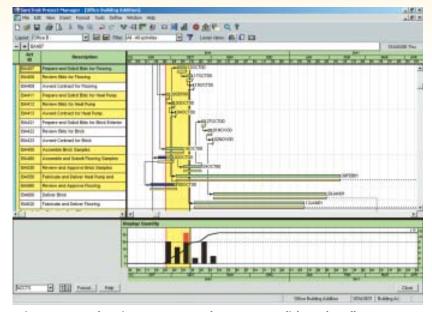
■ SureTrak Project Manager 3.0 Primavera Systems, Inc. 610/667-8600, www.primavera.com \$499 for single-user license

Feature for feature, SureTrak Project Manager 3.0 is similar to Microsoft Project, minus the web-based collaboration tools. It's nowhere near as user friendly, though, and of all the products reviewed here, SureTrak requires the most project scheduling experience to use effectively. That's not surprising, since SureTrak is the little brother of Primavera Project Planner (P3), which is the gold standard for scheduling big commercial construction projects like roads and bridges. In fact, SureTrak can be set up to share P3 project files, ideal for contractors and subcontractors who might have one foot in the commercial construction world.

For home builders and remodelers, SureTrak 3.0 has a few interesting features. Every license includes a copy of Project KickStart, a third-party wizard that walks users through the steps

of setting up a project schedule. Project KickStart can integrate with ACT! or other contact managers to pull in resources without having to retype.

SureTrak also makes use of Fragnets, predefined snippets of a schedule that include activities and the relationships between them, which you can save and reuse over and over.



Primavera SureTrak Project Manager uses the Progress Spotlight — the yellow areas — to help the user quickly pinpoint activities and resources.

Progress Spotlight is a one-click interface enhancement that highlights a range of dates in order to examine activities and resources.

Like MS Project, SureTrak can save views as web pages and has the capability to e-mail schedules and reports directly to project participants.

■ Microsoft Project Standard 2002

Microsoft Corporation

425/882-8080

www.microsoft.com/project \$599 for Project Standard single user

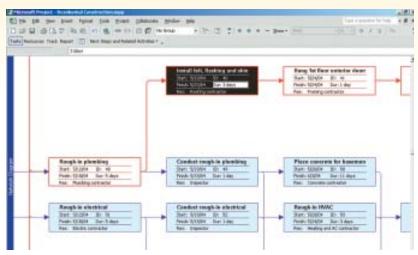
According to Microsoft, 75% of all project managers using software use Microsoft Project. It's estimated that there are five million users worldwide, making Project the de facto standard that all other scheduling software can be measured against. It has every feature discussed here, as well as dozens more that you'll probably never need to use.

Despite the power of Project, Microsoft has made user friendliness a priority, and the latest version is loaded with interactive help and task wizards that let even scheduling novices accomplish advanced scheduling chores. If you haven't looked at Project for a few years, I guarantee you'll be pleasantly surprised at how feature-rich and easy to use it has become. Project ships with some generic residential construction templates, or you can import third-party templates such as those available from 9dots software (www.9dots.com).

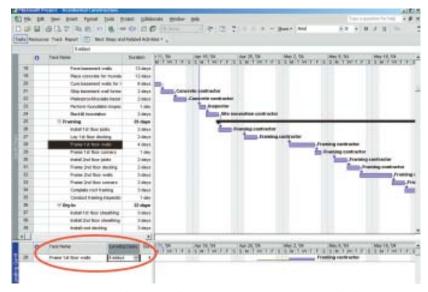
Project integrates easily with the rest of Microsoft Office. Contacts (resources) can be fed from Outlook, Access, or Excel. Tasks can originate in Outlook or Excel and be distributed via Outlook e-mail. Word can be used to tag notes and do mail merges. If you're using ACT! or any other contact management software that can hook to Outlook, you can use those contact address books as well.

One thing that distinguishes Project from the competition is its use of "resource pooling"; it maintains a common database of all your resources —subs, suppliers, equipment, employees — across multiple jobs. Resource pooling makes it easy to spot the over-committed drywaller or backhoe. Project is also strong in the project-tracking department. You can create a project baseline when you first set up a job, then compare your progress to that baseline as you go along.

In recent years, Microsoft has morphed Project from strictly a project management tool into a project collaboration tool, allowing project teams to work together in real time using the Internet. Of course, to use that feature you'll need a copy of Microsoft Project Server (\$1,499 for five users) and a full-time connection to the Internet. If you don't want to set up your own Project server, you can rent space on someone else's. MSProjecthosting.com (www.msprojecthosting.com) offers service for \$50 a month plus \$20 a month per user who connects to the account. If you don't need a fully interactive



A "PERT" or "network view" is a handy way to see and manipulate activities and resources. Here, in Microsoft Project, you can drag and drop to reorder your schedule, or edit items directly in their PERT boxes.



Microsoft Project's flexible "views" let you put a lot of information on one screen. Above are a project list view on the left, an interactive Gantt chart on the right, and a resource leveling view on the bottom.

collaboration site, you can share Project data by publishing static data (a snapshot in time) to any web server with Microsoft Office extensions installed, or you can save list views in Excel or Access.

One thing missing from MS Project is support for handheld devices. Project 2000 (but not 2002) can be synchronized with PalmOS PDAs using a third-party solution called Project@Hand (www.natara.com), but surprisingly, there is no native support at all for Microsoft's Pocket PC platform. According to the company, Microsoft has made the decision to instead pursue tablet PCs for its mobile users of Project.

(Note: For this article, we reviewed Project 2002; by the time you read this, Project 2003 will be available.)

■ FastTrack Schedule 8.0 AEC Software, Inc. 800/346-9413 www.aecsoft.com

www.aecsoft.com \$299 (PalmOS add \$99)

At \$299, FastTrack is only a few bucks more than basic schedulers, but it has big-league features on par with Microsoft Project and SureTrak. What's more, it's one of the easiest schedulers to use and the only product with full support for the Macintosh platform. For another \$99, you can add a PalmOS version for your PDA, which will synchronize with the desktop version or work as a stand-alone.

FastTrack has three basic views: Calendar, Schedule, and Resource. The Schedule view has both a task list and a Gantt chart. If you don't like the existing views, no problem: A distinguishing feature of this scheduler is its fully customizable interface. You can add and move columns, rows,

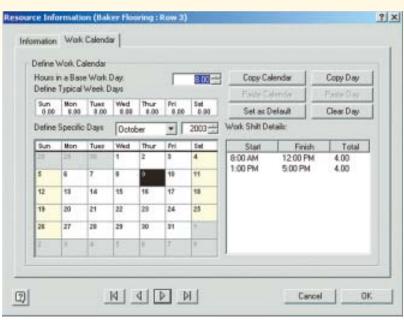
and other elements to create and save an endless variety of views. FastTrack has Excel-like calculating capability to define and track budgets. Resources are fully definable, and each can be controlled with its own calendar.

FastTrack can schedule and analyze resources across multiple projects, a good feature for production home builders. Groups of tasks can be rolled up into milestones on the schedule or saved as "FastSteps" to be reused over and over.

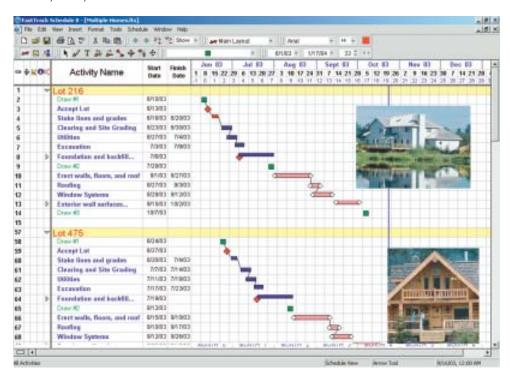
FastSteps is a built-in scripting capability that allows you to automate repetitive scheduling tasks or reports by grouping together a series of commands. For example, a FastStep could be created to generate and print a report of all

unfinished activities every time you update a schedule.

Finally, if you're migrating from whiteboards, you'll appreciate the "wall chart" printing feature that will tile your schedule on standard-size paper.



Like other advanced scheduling products, FastTrack allows you to set different work calendars for each resource in your schedule.



Builders running lots of simultaneous jobs will like FastTrack Schedule's one-screen views. The user-friendly interface is fully customizable.

■ cPM Scheduler

CDCI

800/285-2324

www.cdci.com

\$600 for up to ten concurrent projects; other pricing plans available

Unlike the generic schedulers in this article (Project, SureTrak, FastTrack, QuickGantt), cPM, by Construction Data

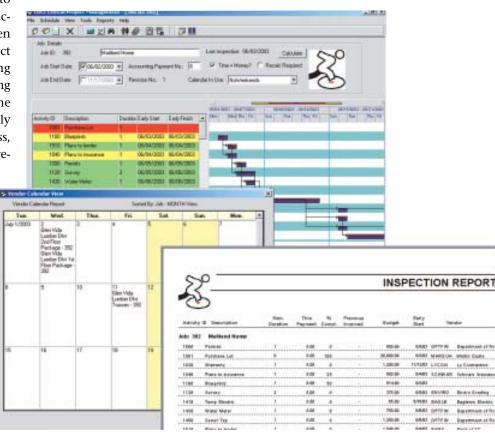
Control, Inc. (CDCI), is built to schedule one thing only: construction. And it crosses the line between pure scheduler and complete project management system by tracking accounting cost codes and allowing project managers to control the schedule from the field. cPM's only shortcoming is that, like VirtualBoss, it can only schedule in full-day increments, which may not be ideal for remodelers.

Only three fields of information — Activity, Duration, and Sequence — are required to set up complete project schedules in cPM. Each activity can be tied to a budget item, either imported from CDCI's accounting software or entered manually when the schedule is set up. All major functions of the scheduler are mirrored in the PDA versions, which will run on either PalmOS or PocketPC devices. Project managers can manipulate the schedule.

approve budget items, and check off to-do items right from their handheld computers.

CDCI has also realized that not all builders are ready for PDAs. A number of useful "clipboard-friendly" reports, such as Job Inspection Worksheets, Activity Details, and Vendor To-Do Lists, build a bridge between the electronic world of the construction office and the paper-based world of the typical project manager. All reports can also be written to over a dozen standard computer formats, including text, Excel, and HTML, for distribution via e-mail or the Internet.

cPM is available as a stand-alone scheduler or can be combined with CDCI's accounting software to form the field component of a robust purchase-order and pay-from-PO system for production builders.



CDCI's cPM combines an easy-to-use scheduler with project management tools like job to-do lists, budget tracking, and job inspection worksheets. cPM's PDA modules allow project managers to maintain the schedule and approve budget items right from the field.

■ BuildLinks Online Scheduler

BuildLinks

800/803-3002

www.buildlinks.com

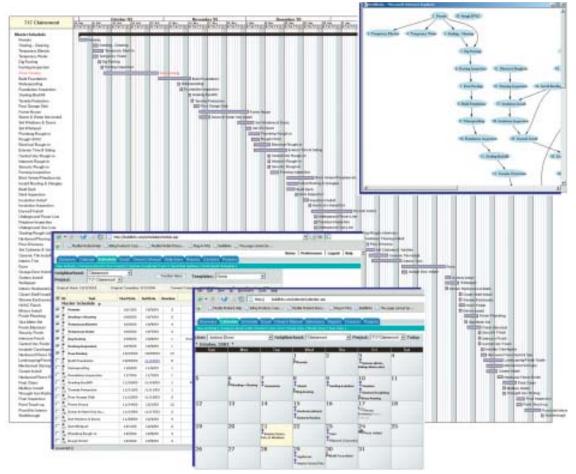
\$75 per home scheduled, \$1,000 one-time setup fee

Web services continue to peck away at the conventional software market for good reason: There is no easier way to share project data than to put it up on a website where anyone with a browser can access it. The full BuildLinks system is an "online collaboration" service with a twist: one view for the home buyer and another for the builder. Buyers logging on to the system are greeted by a friendly project overview, while builders log on to track all the gory details. This two-sided approach works well: You can show customers what they need to know and do at all times without worrying them with unnecessary detail. The BuildLinks Scheduler is the latest module in the BuildLinks online system. It's available stand-alone or integrated into the other BuildLinks project management tools.

Despite running in a web browser, the BuildLinks Scheduler is conventional in approach. Tasks, resources, and dependen-

cies are scheduled in a list view, which automatically generates an interactive bar graph similar to a Gantt chart, and a calendar view. Lead and lag times are created by altering date ranges in the list view, and the user can select whether a particular activity will appear on the homeowner calendar, the builder calendar, or both.

It's obvious that a lot of "builder-thought" went into the BuildLinks Scheduler. For example, you can make a task dependent on completion of a task in a different project, a necessary scenario for townhouse or condo builders who are running a separate "shell" schedule. You can also do basic resource allocation to see where a particular sub is scheduled across all projects. All reports can be "printed" to .PDF files, and the system will automatically notify participants of schedule changes by e-mail.



BuildLinks Scheduler is totally web based but rivals conventional software. It even adds a few tricks of its own, like automatic updating via Nextel Blackberry pager and an unusual bubble chart (inset). BuildLinks' familiar calendar view (in front, at bottom) makes it easy for buyers to see selection dates and project milestones.

■ VirtualBoss 3.6

VirtualBoss Software 888/827-5397

www.virtualboss.net \$395

Created by a builder, VirtualBoss combines a simplified critical path scheduler with a basic contact manager, a good combination for hands-on contractors who don't have the time or patience to learn more complex scheduling systems.

VirtualBoss has three basic modules: Job Manager, Task Manager, and Contact Manager.

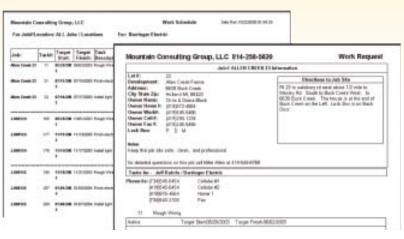
The scheduler itself is very basic. Everything is lumped together in a master "task list," which you can filter by project, by contact, or by date. You can also create project "groups" — for instance, to filter a list of all material deliveries, or to see all the tasks related to a particular subdivision. Scheduling is in full-day increments only. The start

date of a task can be linked to the completion date of a previous task to create a basic critical path schedule, but there are no advanced constraints, no resource leveling, and you can assign only one contact (resource) to a task. The builtin contact manager is adequate for looking up phone numbers on the fly and keeping track of essential address information, but it is not very customizable and does not log client activity, except for e-mail.

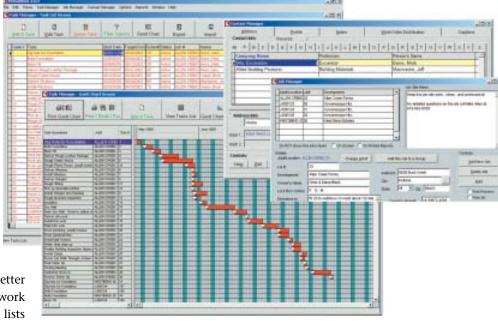
It's not the fanciest scheduler or the most versatile contact manager, but VirtualBoss has a better trick up its sleeve — automatic work orders. It lets you distribute task lists and individual work orders painlessly

with just a few mouse clicks — by computer fax (Windows fax drivers or WinFax Pro required) or e-mail — to whoever needs to see them.

VirtualBoss is all about ease of use, and I can envision even computer greenhorns having no trouble riding around with VirtualBoss on a laptop computer, scheduling and tracking their projects, and using the program to send work orders right from the job site. A PocketPC companion version is also available (\$60), and PalmOS PDA users can get information in and out of VirtualBoss by using a third-party utility like Documents To Go (www.dataviz.com).



VirtualBoss generates individual work orders, as well as complete project lists, and delivers them to whoever is responsible by computer fax or e-mail.



The VirtualBoss interface is simplicity itself: a window for setting up projects, another for setting up contacts (resources), and two task views, a list and a Gantt chart.

■ QuickGantt Plus 4.0

Ballantine & Company, Inc.

800/536-6677

www.tools-for-business.com

\$249 for single-user license; other versions start at \$99

If all you want is very basic list-based scheduling with at-a-glance visuals, QuickGantt Plus might be just what the doctor ordered. It hasn't changed much since we reviewed it in 1998 (*Computer Solutions*, 9/98). The interface features three tabbed views: Worksheet, which is similar to an Excel worksheet, Gantt Chart, and Notes. You won't find PERT charts, resource leveling, or Internet-based collaboration, but you will get speed. Working in the Worksheet view, you

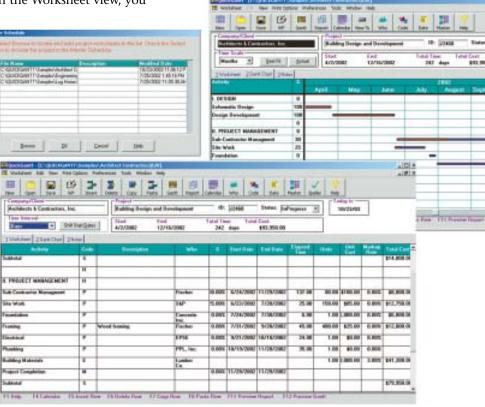
can set up the bones of a typical residential schedule in just a few minutes. One nice feature is a budget column where you can plug in costs for various line items. You can also create a "master schedule" by grouping individual worksheets

together. The result can then be filtered by individual jobs or merged into one combined worksheet. QuickGantt also has the ability to compare a baseline schedule with a revised version.

QuickGantt Plus integrates with Ballantine's QuickAssist contact manager to link to resources directly, and you can import and export to a number of standard formats, including Access, Excel, and

comma-delimited text. Finally, in the PDA department, a \$25 add-on makes QuickGantt the least expensive PDA-enabled scheduler in this roundup.

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QuickGantt's simple and straightforward interface makes it possible to set up a schedule in minutes. Worksheets can be combined to form a master schedule (left).