

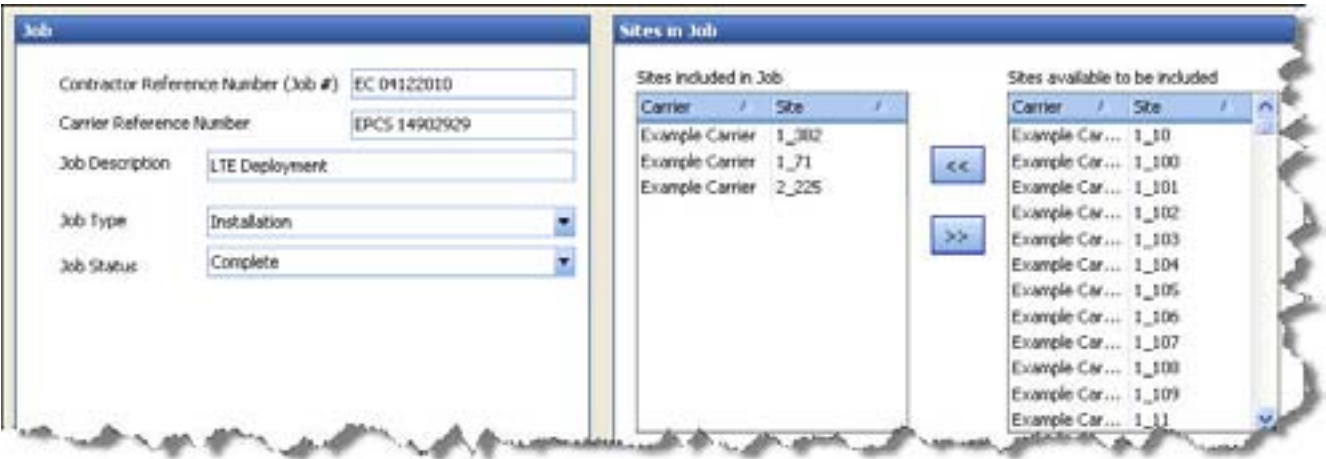


The AntennAlign Profile Manager (APM)

The **AntennAlign Profile Manager (APM)** software application is a key component of the **Sunsight Alignment Solution (SAS)**. From the beginning, Sunsight engineers set out to build an end-to-end alignment solution which not only provided the means of accurately measuring antenna alignment, but also streamlined the process required to collect and manage that alignment data. SAS sets forth a Method of Procedure that is simple to follow, yet flexible enough to allow on-the-fly design changes when a discovery in the field necessitates them. APM is your window into these processes. It provides the visibility needed for RF engineers and construction managers to operate in unison with contractors and field personnel.

APM is an enterprise quality application which may be run in a full client-server configuration to provide interdepartmental access to alignment data across a corporate local area network. It provides the following primary benefits:

Management of Contractors and/or Field Technicians



Managing multiple contractors who are each aligning hundreds, or even thousands of antennas can be quite a challenge. APM is designed to bridge the communication gap between RF engineers, construction managers, and contractors while ensuring data integrity at every step of the process. APM provides manageability at a high level by introducing the concept of a 'Job'. Jobs created within APM allow RF engineers and construction managers to assign work to a given contractor or field technician. Sites are associated with the Job record, which ultimately allows grouping and reporting of only the relevant alignment results. Jobs may be tracked by type and status, allowing visibility into the progress made by installers during large deployment or audit projects.

Archival of alignment data

EC DH122010		Example Carrier San Francisco 1_382 Alpha 1				AP18-1940...		L...		4/13/2010 9:58 PM		Ipeason		4/13/2010 9:58 PM			
Captures	Quality		Latitude		Longitude		Azimuth		Mechanical Tilt		Roll		Height		Captured		
	AQE	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	By	Date	Delete?	
	97	37.298400	37.298724	-121.764000	-121.764126	20.0	19.9	0.0	0.0	0.0	0.0	-1.4	46.0	N/C	J83	4/15/2010 1:27 AM	<input type="checkbox"/>
	80	37.298400	37.298736	-121.764000	-121.764115	20.0	19.9	0.0	0.0	0.0	0.0	-1.4	46.0	N/C	J83	4/15/2010 1:35 AM	<input type="checkbox"/>
	EC DH122010 Example Carrier San Francisco 1_382 Beta 1 AP18-1940... L... 4/13/2010 9:59 PM Ipeason 4/13/2010 9:59 PM																
	EC DH122010 Example Carrier San Francisco 1_382 Gamma 1 AP18-1940... L... 4/13/2010 10:00 PM Ipeason 4/13/2010 10:00 PM																
	EC DH122010 Example Carrier San Francisco 1_71 Alpha 1 AP18-1940... L... 4/13/2010 9:40 PM Ipeason 4/13/2010 9:44 PM																
Captures	Quality		Latitude		Longitude		Azimuth		Mechanical Tilt		Roll		Height		Captured		
	AQE	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	By	Date	Delete?	
	88	37.578400	37.578344	-122.348000	-122.348433	100.0	127.5	0.0	0.6	0.0	0.0	-0.1	86.5	N/C	J83	4/15/2010 4:15 PM	<input type="checkbox"/>
	91	37.578400	37.578305	-122.348000	-122.348458	100.0	100.3	0.0	0.0	0.0	0.0	-0.1	86.5	N/C	J83	4/15/2010 8:07 PM	<input type="checkbox"/>
	EC DH122010 Example Carrier San Francisco 1_71 Beta 1 AP18-1940... L... 4/13/2010 9:41 PM Ipeason 4/13/2010 9:44 PM																

Optimizing a wireless network is an iterative, methodical process which must continually incorporate changes to physical network configurations, deployed technologies, morphology, etc. Changes made to a network must be analyzed, and if results don't match expectations, having an accurate, reliable alignment history for a given site is instrumental to troubleshooting network design and interference problems. APM archives alignment captures for your antennas each time they are adjusted using the AAT. These records are stored and may instantly be retrieved from an enterprise-quality SQL Server Database Management System. By centralizing alignment data in this fashion, Sunsight has eliminated the problems associated with maintaining multiple disconnected spreadsheets or PDF reports. Using a proper database enables data mining for meaningful trends and patterns when troubleshooting network inconsistencies. Excel spreadsheets have been known to disappear with a stolen or damaged laptop. APM's database may be installed on a SQL server in the corporate I.T. room where it may be protected and regularly backed up.

Reporting of alignment data

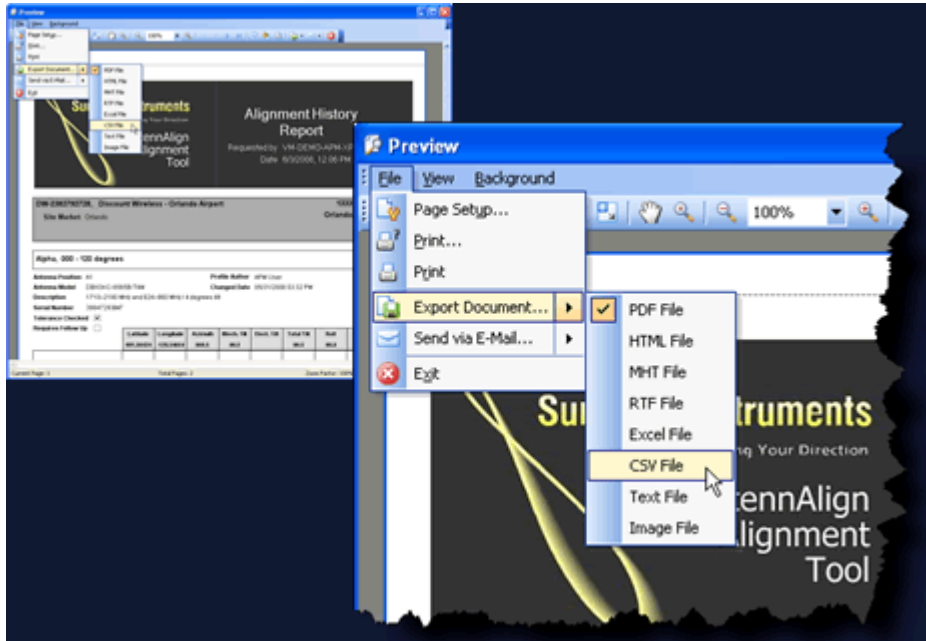
Sunsight Instruments		Site Alignment Results									
AntennAlign Alignment Tool		SFO 1_71									
JOB EC 04122010		LTE Deployment									
SITE SFO 1_71		Final Latitude: 37.578305		Tolerance Checked: <input checked="" type="checkbox"/>							
		Final Longitude: -122.348458		Tolerance Profile: LTE / CDMA							
Antenna Position	Target	Azimuth Previous	Azimuth Final	Mechanical Downtilt Target	Mechanical Downtilt Previous	Mechanical Downtilt Final	Roll Target	Roll Previous	Roll Final	Height Target	Height Previous
Alpha 1	100	127	100	0.0	0.6	0.0	0.0	-0.1	-0.1	86.5	NC
Beta 1	210	192	210	0.0	0.1	0.1	0.0	0.0	-0.2	86.5	NC
Gamma 1	320	316	320	0.0	0.1	0.0	0.0	0.3	0.0	86.5	NC

Understanding how changes made to your network have impacted key performance indicators begins with reliable, accurate data and insightful reports. APM is shipped with four (4) detailed reports which concisely communicate much needed network alignment information.

- 1) **Site Alignment Results Report** - This report highlights "target", "previous" and "final" alignment values for each measurement type collected by the AntennAlign. All of the information concerning a site typically fits on a single page report.
- 2) **Alignment History Report** - This report lists all of the previous alignment captures associated with an antenna and allows the reader to compare them with the current design specification. When tracking the performance of your network over time, this historical perspective can be quite enlightening.
- 3) **Capture Details Report** – This detailed report contains an in-depth look at a selected alignment capture record. When focusing on a problematic sector or antenna, this report is all that you will need.
- 4) **Antenna Conformance Report** - This report graphically describes how a particular antenna conforms to the tolerance specification established by the operator and enforced by the AAT. As with all of our reports, this report paints any alignment value which is considered out of tolerance in red.

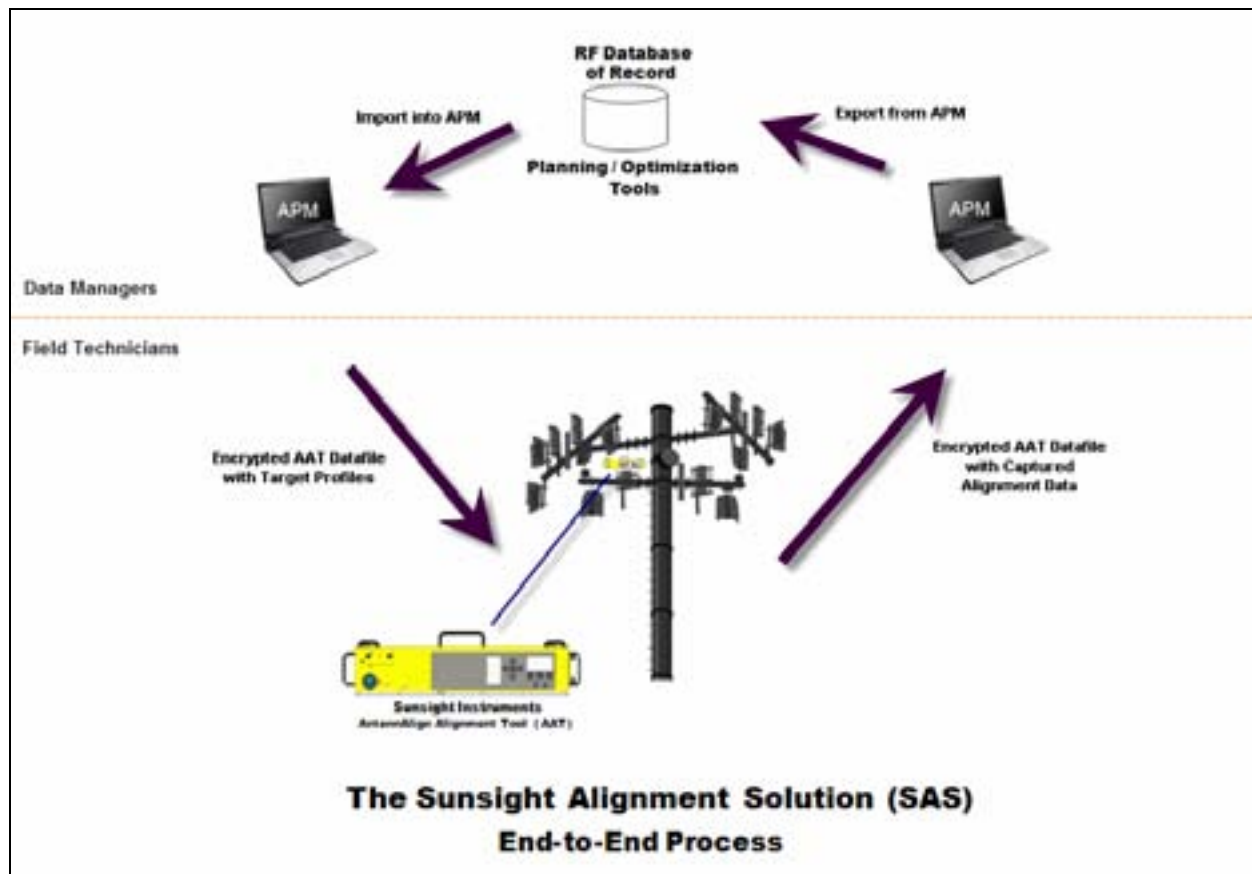
Exporting Reports

All APM reports may be exported to several different file formats. These include PDF, HTML, MHT, RTF, XLS, CSV, TXT, or JPG.



Have an idea for the ultimate alignment results report? Contact SunSight Instruments for custom APM reports designed to your specifications. These are available for a nominal engineering fee.

Synchronization with planning and optimization tools



With 300 or more sites in a given wireless market, the data associated with antenna alignment can be extensive. Planning and optimization tools are "garbage-in, garbage-out". In order to maximize the capabilities of these tools, alignment data must be accurate and well maintained.

Import Data into APM

Hand keying alignment specifications for a large wireless market into APM may be time consuming and impractical. For this reason, SunSight Instruments offers a cost effective service which enables bulk import of alignment data into APM from your optimization or planning tool. Most optimization and planning tools are capable of producing a CSV or XLS export. Our staff will work with you to map the relevant fields to APM data fields. When the APM import is complete, SunSight will install the updated database. Your APM data would then be synchronized with your planning or optimization tool.

Exporting Data from APM

After completion of an alignment job or project, your optimization or planning tool should be updated to reflect the alignment data captured in the field. APM offers a custom export feature which is capable of creating an export perfectly suited to your optimization or planning tool's import feature. Selection features allow you to filter the APM data to only the Job(s), Site(s), or date range you desire. These exports may be generated at any time with a few simple clicks. No more "garbage-in, garbage-out"!

Conclusion

APM is just one more reason why RF engineers and construction managers can be assured that the network they designed is the network they deployed when using the SunSight Alignment Solution.