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SPECIAL REPORT

Building the Perfect AM System

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CHICAGO I recall the first time I heard of Tom King and Kintronic. I was working with another engineer on a blown-up isocoupler. We pulled the defective device, shipped it to the factory, and had it back within five days.

Fast-forward about 10 years. I have since installed two fairly large systems employing Kintronic phasing and antenna tuning equipment and have contracted at several stations that also employ Kintronic equipment.

CONSULTANT'S WORD

One point I need to stress before construction begins on any project: Obtain the design consultant's word about component rating. Afterwards, confirm the selection with Kintronic's technical staff to ensure the device voltage and current ratings are sufficient to survive the great stresses encountered during maximum modulation and static discharges.

I have found Jim Moser and Bobby Cox most resourceful in this regard. They suggested not reducing the values and they have not failed me yet.

The most recent exercise involves a station which rebuilt the entire plant, including towers, ground system and transmitter building.

The mission directive from the owner was to design a stable, reliable, robust yet cost-effective system. They saw the end product of a system shortchanged from the start and did not want to pour precious resources into a new system destined to the same fate.

With that commitment in mind, my decision was easy. I knew Kintronic follows that same philosophy.

During the design process, I met with Moser, the senior staff engineer, Cox, the chief RF design engineer, and King, the president of Kintronic, to generate project specifications.

This site is unmanned most of the time, improved reliability and resistance to outside environmental factors are priorities. Previous experience with installing Kintronic gear allowed me to envision the results of any specially needed features.

Jim and Bobby proposed a cost-effective (for the project), yet elegant approach to a pretty complicated system. The result was an appealing, workable and maintainable design.

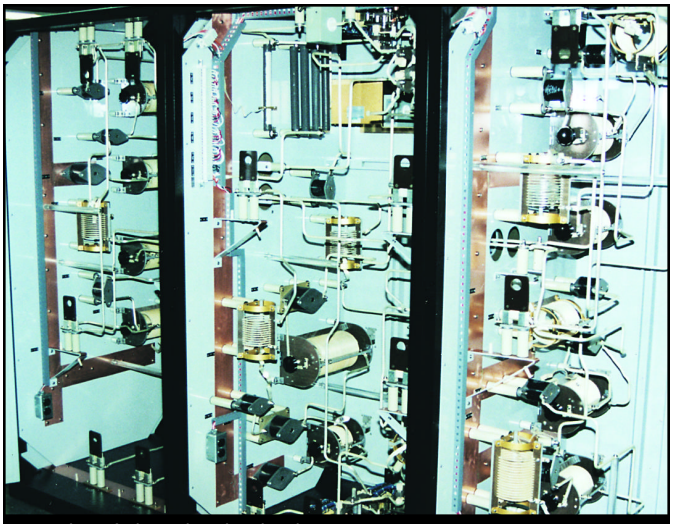
We opted for the standard mechanical switching and control system due to a preference in minimizing exposure to lightning damage.

Jim and Bobby designed a control system, which met my desire to minimize control facilities located in the ATUs, isolate AC circuits for all RF contactors and provide the necessary remote access and status features needed to monitor the site effectively.

I also opted for ISO-9000 type barrier blocks instead of the standard cinch-type terminal strips. The reasoning is simple — over time, we all have had to replace terminal strips due to corrosion, lightning strikes, lug burnout or simple component failure.

The ISO type blocks are rail-mounted and can be individually replaced as needed. Installation time is saved because lugs are not needed.

Another nice feature on the ISO barriers is a banana socket for DVM/VOM probes, which have banana-type ends. If you don't have a banana connector, you can use a clip lead and not worry about it falling off a terminal block screw head.



Inner view of Kintronic's Directional Antenna and Phasor Cabinet

One activity that I attempt to repeat on major projects is inspecting equipment purchases at the factory prior to shipment.

I made the sojourn to Bristol, Tenn., at a point when the ATUs were built and the phasor was in progress. On a complicated system, a day trip is worth the effort.

My first impression of the facility was profound indeed. Aside from the fact the plant is nestled in the low hills of eastern Tennessee in a nondescript building, the hustle and bustle inside would have led me to believe the factory was anywhere but the seemingly laid back foothills setting.

The trades employed ranged from machinists, who craft many of Kintronic's custom metallic parts and assemblies, to sheet metal workers, welders and painters.

Other than the tube, coil and strap silver plating, little work is farmed out due to the specialized nature of constructing custom precision HF/MW tuning equipment.

Many of the craftsmen have been with Kintronic a long time, which leads to consistent quality and insight towards solving complicated mechanical challenges. This is heartening in these days of merciless cost-cutting mass production.

Kintronic Custom-Built AM Directional Antenna Phasor Cabinet and Control Rack

It appeared to me many of the tradesmen consider their work an art form of sorts and a great deal of pride is part of the end product. As each project is a custom build, the only items common to all the products are the stainless steel hardware used in everything.

Everything else is custom. And believe me, I had some very custom build items on the specification list.

During the inspection, I identified a slight fabrication misunderstanding on the sampling cable bulkheads in the ATUs. A brief constructive dialogue with Jim and the fabricator led to a simple factor- installed modification prior to shipment.

The simple modification, made in a controlled environment with a proper inventory of parts and tools, saved me at least a week of corrective fieldwork had the issue gone undetected before shipment. On a tight time line, that week could have proven costly. Thus, the trip was worth the effort.

I walked away from the inspection with a high comfort level knowing the installation side will go forward as planned and I can focus on other more pressing matters, such as stacking towers, trenching cables and plowing radials.

When we took delivery, we experienced a fabrication hiccup with the phasor.

The coaxial cable bulkheads entering the bottom of the cabinets were located several inches deeper from the rear than what we designed. With the site master plan and equipment already in place, moving the cabinets back was not possible.

Jim and Tom arranged for some replacement parts, covers and tools to be shipped and they picked up my time to make the modification. They even sent up a real cool drill/tap tool (which I broke) to speed the installation. I have yet to encounter a manufacturer who will accept that level of responsibility for a fabrication faux pas. That was refreshing indeed.

The actual component mounting is ergonomically laid out for the most part so as to allow simple extraction of a device should repairs or replacement become necessary. Other fabricators require the person making the repair to be a gymnast with three hands in order to access equipment in a deep cabinet. This is where the deep 40-inch cabinets pay off.

As was expected to some degree, the shipping date was moved back several times after the deposit was mailed due to complications with a project ahead of ours.

Fortunately, we were equally delayed and the ultimate delivery timing worked out. However, going into the next project, I will press both sides of the project to nail delivery dates further in advance. Hopefully, through better coordination we can prevent any misunderstandings if time is tight and the project is ready for delivery of the parts.

FRUITS OF LABOR

As I am writing, the latest project where I am using Kintronic gear is just about complete. The eight ATUs and two iso-coils are hung and the three cabinet phasor in place. We are pulling control and coaxial cables through fiber ducts to the towers and making the final connections.

I will then go through and check every nut, bolt, and related RF conducting fastener to make sure they are all tight after a season of thermal cycling. I have found a couple loose nuts during the initial install thus far but that may have occurred during transit. Nonetheless, a good practice before the consultant arrives.

A standard feature is the laminated schematic mounted on the wall of the door to the ATUs and the phasor. This is handy if you are working on a station where you are unfamiliar with the layout. Another nice standard feature is the inventory of spare hardware and standoff insulators shipped with the system.

In every shipment, at least one standoff insulator breaks and needs to be replaced. Having the spares sent as standard practice saves the headache of calling and wasting their time shipping up one or two pieces.

They also send spare relays, tubing, coil tap clips and silver plated coil tap strap — basically everything you will need to maintain the system for years.

The spares are handy if you need to make some changes during the tuneup or later. Again, saving time and effort for everyone involved.

The previous Kintronic-equipped installations that I have executed or maintained have survived some daunting conditions.

From lighting, to floods, to fires (not caused by the phasor or ATU), the gear has survived and required little remedial attention outside of the work necessary restore operation after those events. Even the occasional mouse, snake or skunk.

Sure, Kintronic might cost a little more than some other fabricators. But in mission critical situations, I need equipment vendors/fabricators I can count on to deliver equipment that will survive. From personal experience, I know Kintronic will deliver that performance.

For more information contact Kintronic Labs in Tennessee at (423) 878-3141, fax (423) 878-4224 or visit the Web site at *www.kintronic.com*