

Blueprint For The Future?

A wireless LAN backbone for touring

by Dave Kay

I've always been a fan of technology that is easy to use, gets results quickly and doesn't require you to read the manual.

With this in mind, I approached Iain Gregory from BSS Audio (U.K.). Being an avid Varicurve user, I knew that it was being discontinued, so I talked with Iain about developing a solution that matched the easy-to-operate, user-friendly interface of the Varicurve remote.

I had looked around at other products, and it appeared that no one was planning a dedicated remote. The reason given was that most would use such a device remotely via a laptop computer, but what good is it if you have to click through pages and move faders and knobs with a mouse during a show? You just want direct access to the equalizer, make the change and carry on mixing the performance.

In the past, the BSS-based solution

would have been to pass audio through a BSS Soundweb and then back into FDS-366 Omnidrive units. Control would be from a PC at front-of-house (FOH), and a third party piece of software (Symantec pcAnywhere) would allow remote control of the main computer from a tablet PC over a wireless link.

This was an expensive solution – and not the friendliest system to set up – but it still had the upper hand because it allowed access to the earlier digital Omnidrive crossovers remotely. As a result, the engineer could EQ the system, change crossover gains and mute parts of the system while sitting anywhere in the venue.

There was a lot of front-end EQ in the Omnidrive that wasn't being utilized. So instead of trying to re-invent the wheel and add another device into the signal path, I suggested an interface that allowed the engineer to chain together the input EQ of two Omnidrives, and to then EQ the system from that. Further, a revision of BSS Soundbench control software – another piece of this puzzle – was overdue. (This was something I'd been harping about for ages.)

Despite extended conversations and the apparent usefulness of at least some of the ideas we discussed, I thought it likely would be the last I would hear of all of this.

But a few months later, I got back in touch with Iain, reminding him of our earlier conversation. In a matter of days, he called me back and told me that it was a “go” project. BSS was working on a new platform for something else alongside a new version of Soundbench (called SB2), and further, some of my ideas could be worked into the project brief.



Bowie and mates in mid-concert form, with wireless LAN backing.

Developments

When the hire company I work with, Adlib Audio “based in Liverpool, U.K.,” was quoting a system for the upcoming David Bowie tour, part of FOH engineer Pete Keppler’s specification called for “wireless system control.” This capability would enable him to voice the rig from anywhere in the venue.

I had a few options up my sleeve, and when the tour was confirmed, the conversations with BSS intensified. To the point, I wanted a simple solution that didn’t involve running multiple software packages on a tablet PC, for purposes of controlling the 10 366T Omnidrive Compact Plus units to be utilized in the Bowie system.

THROWING AROUND IDEAS

Adam Holladay, the project development manager at BSS, introduced me to Graham Hammell, who was responsible for the programming code of SB2. We spent a day throwing around ideas and suggesting features that would be needed in the first version of the software.

I returned to Liverpool to start constructing the wireless LAN that would run an Ethernet backbone, enabling PC tablet control of the ever-increasing rack of Omnidrives that were to be deployed for system processing on the Bowie tour.

Tony Szabo, our system tech for the tour, suggested we use a Cisco Aironet Wireless Access Point, which he’d used with success on a previous tour. I consulted Fast Networks, a local supplier, and together we came up with a system that would give us a very good coverage in the large venues we were going to be working in.

The problem in the majority of Europe is that the radio transmission power is limited to 50 milliwatts (mW). So to maximize coverage, it would have been impossible to rely on the standard antennas embedded into PCMCIA wireless cards or tablet PCs.

The most widely accepted (and cheapest) wireless Ethernet standard at present is 802.11b and the maximum network speed is 11 megabits per second (Mbps). As you move away from the transmitter, the signal decreases and so does the bandwidth (speed) of the connection.

To overcome this, we mounted external diversity antennas onto the tablet PC to maximize the speed of the network in the far field. Because the tablet could get a better RF signal, everything could communicate faster.

The way SB2 works is that each Omnidrive is plugged into a separate RS232 serial port on the PC, and each unit is addressed by its serial port number. In a fixed installation, this is relatively easy, because USB communication (com) ports are freely available in blocks ranging from 1 to 16. (On the other hand, most laptop PCs offer just two serial com ports, and on the majority, these connections are getting more rare as everything moves over to USB.)

In the design of our system, I wanted the tablet PC to directly control the Omnidrives. This could have been done with a PC at FOH controlled remotely by a tablet PC, which is the way I’ve seen wireless control in the past. However, it seemed to be duplicating the potential for problems, and further, results in sending lots of video data over the network, making it very, very slow. I thought there must be a much more straightforward solution.

After a quick trawl of the Internet, I found a company, Amplicon LiveLine, the U.K. distributor for Moxa. One of its products is a Moxa NPort DE-303, a 16-port RS232-to-LAN device server, which can sit anywhere on a network and transparently provide remote serial ports that can be directly assigned to any computer on the same network.

The tablet PC was now connecting over a wireless Ethernet network provided by the Cisco Access Point, and then the Moxa server was sitting on the wired Ethernet network, which, in turn, was connected to the bank of Omnidrives. This gave us a very good solution with the least components in the chain.

With the network now in place, I optimized the access point and the



The author with a portion of the new system he helped devise.

wireless card on the tablet and we were ready to rock.

TOUCH SENSITIVE

Over the next few days, Graham and I designed the custom SB2 panels for the tablet that Tony and Pete would be using to set up and run the show. After building the control panels, we realized SB2 would need some changes in order to optimize it for use with a tablet PC. No longer using a mouse or keyboard, the interface had to be made more rugged, because precision clicks and holding down the shift key were not an option.

For the unfamiliar, a tablet PC is basically a “touch sensitive” screen that looks as though it has been hack-sawed off a laptop computer – effectively, it’s a PC in a very small frame. Control is provided by a magnetic stylus/pen with buttons on the side to point and click on the screen, which can move faders and EQ, enabling the user to literally draw what he/she wants to hear. For our application, we chose a Fujitsu ST4100 tablet, which has an optimized screen for exceptional visibility outdoors.

Developments

After a bit of control panel re-design, a few software modifications and some very intensive testing, we were ready to hand it over to Pete and Tony in time for their tour pre-production work commencing in Brussels, Belgium.

As with anything, as soon as we began using this system, there were further ideas for making it work faster, and for more features. Even while waiting at the airport in Brussels for a flight home from pre-production, I began adding features that Tony had mentioned, as well as shuffling the control panels around, and these were simply e-mailed to him when I arrived home.

The beauty of the new SB2 software package is that it's very easy to change the views, layouts and controls in the same way as you would with Soundweb. Just drag and drop the required controls onto the control panel.

The next day, I was back at BSS with Graham setting up an exact replica of the system touring with Bowie, so if any improvements were made or we encountered any major problems, we could just exchange files by e-mail, thoroughly test, and turn things around very quickly.

In fact, we were very impressed by the stability and speed of the platform.



Despite appearances, Pete Keppler is pleased with the ability to control the Omnidrives.

SB2 is database driven, so even if Windows crashes or you lose power when you are designing panels, no work is lost. If the system becomes disconnected from the tablet, then all the data from the Omnidrives is automatically reloaded; no audio is lost. Further, any spurious settings can't be sent back into the Omnidrives if the PC version of the design is corrupt.

Another neat feature of SB2 is that it facilitates two-way communication between the Omnidrives and the PC, allowing the sound engineer to see the status of the meters and mutes on the devices and allows them to set the interval between data refreshes.

COMING ESSENTIALS

I see this project as a significant leap forward in tactile user interfaces that can remotely control any networkable or RS232 controlled device. And it's a handy tool for all system techs and FOH engineers.

Wireless networks will now be essential for hire companies bidding on serious tours. It opens another avenue of knowledge that someone in the company will have to learn, but at the same time, once set up, it requires no real maintenance as long as the wireless security remains reliable.

The technology will improve as the price of faster wireless standards such as 802.11g (54 Mbps) reduces and becomes available to the mass market. Manufacturers need to insure that any software interface they produce can be optimized for use on a tablet and that there is a good feedback path to improve and develop their software.

In terms of other solutions, the Lake Technology Contour processing system is also a



All together, the 10 Omnidrive units for Bowie's tour, and their wireless master.

very serious contender that offers some great features. However, if you have a large BSS inventory, it means replacing units. A free download is a more cost-effective option.

At PLASA last fall, we saw some very interesting products from TC Electronic that offer network sockets on the rear of the units (as does Contour), allowing the swapping of the Moxa server for a standard Ethernet hub to link all of the devices together. Also, the device numbering is much more transparent – better for the technophobes. (Who wants to know about serial ports anyway?)

The design of SB2 and all other platforms will hopefully be a continuous work in progress. No doubt that someone will always come up with another great feature.

It would be good to get a device control method that is standard across manufacturer platforms; otherwise, everyone will be continually writing software for their own device/desk/networked whatever. After all, the lighting community sorted that out with DMX 512 many years ago! ■

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