



# CHAPTER TWENTY NEWS

society of broadcast engineers  
pittsburgh chapter

April 2003

Volume 11 Number 4



Dave Benco

## Last Meeting

Nineteen broadcasters and friends attended the March meeting at Cornerstone Television in Wall on the 20th. We enjoyed a free meat loaf lunch provided by Axcera.

Chairman Sam Zborowski announced that the DTV seminar would have to be moved from the June 26 date because of a scheduling conflict at WQED. He also talked about the history of difficulties with DTV reception and how much the chip sets have improved and about moving multi-path, time delay multi-path and large multi-path problems. Kim Cannon talked about the National Broadcast Museum which is right here in Pittsburgh.

Axcera's Dave Benco gave a talk on Linear and nonlinear distortion in IOT transmitters. He discussed Adaptive Equalization and how to maximize performance. We moved away from the lunch tables out to the transmitter area where Don Thomas gave an overview of the recently installed Axcera "Visionary" transmitter and associated systems, including the step start high voltage system and the RF output filters.

## Second Month In A Row

In Chapter 20, not only are there free lunches, but there are also free dinners. Axcera picked up the tab for our lunch in March and Armstrong Cable's engineering department has offered to pick up the tab for our dinner at the April meeting. Please RSVP by the 15th per "Next" article.

Menu: Roasted chicken, potato, green beans, salad, coconut cream pie.

## Next Meeting

### RSVP Needed for Evening Meeting

Our April 17th meeting will be at Armstrong Cable's Master Headend facility in Zelienople. We will see how Armstrong does analog TV, digital TV, satellite channel, digital cable modem feeds and EAS from this central facility.

Armstrong feeds 60,000 analog cable homes and potentially 125,000 digital cable homes via thirteen hub sites from here. The site has redundant aerial and underground feeds to the systems. Commercial insertion is also done here.

Our hosts will be Ed Hassler, Director of Engineering, and Roger Hughes, Operations Engineer. We will meet at Armstrong's office at 531 Perry Way in Zelienople (see map).

We will eat there and start the presentation there. We will then move a mile away to the actual head end site.

To top it off, Armstrong is treating us to dinner. An RSVP is needed by noon April 15. Email number attending to [gstewart@ctvn.org](mailto:gstewart@ctvn.org) or call Gary Stewart or Blake Richert at 412-824-3930.

## Next Meeting

**Time:** Thursday, April 17

**6:30 P.M.**

*Come at 6:00 P.M. to shoot the breeze*

**Program:**

**Cable TV Master Headend**

**Place:**

**Armstrong Cable**

531 Perry Way, Zelienople, PA

**Free Dinner compliments  
of Armstrong Cable!**

*RSVP by the 15th as per Next  
Meeting article*



## Chairman's Corner DTV Seminar

R.W. Sam Zborowski  
samzborowski@stargate.net

### Zenith DTV Seminar in Pittsburgh- Update your calendar!

The DTV transmission seminar previously scheduled for Thursday 6/26/03 has been rescheduled due to a time conflict with WQED's facilities. As of this writing, the Zenith website ([www.zenith.com](http://www.zenith.com)) shows the old date. The new date is Tuesday 7/1/03, to be held at WQED's studios in Pittsburgh.

This one-day seminar has received excellent reviews from broadcasters in a number of locations around the country. The course will include a bound set of notes for each paid attendee and lunch will also be provided. The Zenith website has an overview of the course coverage. The fee for this course is expected to be \$55 (\$45 for early registration). More detailed information will appear in the next newsletter.

### CAE Replaces CEM

Effective April first, Pennsylvania State Police, via PEMA, began sending 'AMBER ALERT' messages using the new EAS Code "CAE" {Child Abduction Emergency}.

Please Insure Your EAS Encoder/Decoder has CAE flagged for automatic forwarding! This change is most important to avoid the extensive problems caused by using the CEM code {Civil Emergency Message} that we were forced to use until the FCC adopted the new codes.

This is a change that impacts 'Public Safety', be sure that your facility can pass an AMBER ALERT {CAE} when the next child abduction emergency occurs!

### PAB Says Resume EAS Testing

PEMA cancelled EAS tests when the war began. However, after communications between PAB, PEMA and the FCC, it has been decided that all stations in Pennsylvania should resume weekly and monthly testing of EAS effective April 2, 2003.

It is felt that listeners and viewers are now less likely to be alarmed by the testing tones and message as they could have been at the war's outset.

For the two weeks' tests that you should not have run, you should enter on your operator's log, "testing not performed per PEMA directive." FCC inspectors will not cite anyone with proper logging of these nonevents.

Our next monthly EAS test will be April 23 at 12:05AM and will originate at the PEMA Emergency Operations Center in Harrisburg!



*Sam disappeared after the meeting. We found him up in the rafters playing with the RF plumbing.*



**Chapter Twenty News** is published monthly  
(except during the summer) by

**Society of Broadcast Engineers  
Chapter 20  
P.O. Box 16312  
Pittsburgh, PA 15242-0312**

Web page <http://www.broadcast.net/~sbe20>

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## VMP Studio and CG Xtreme Part 2, Installation

by Steve Christiano  
Senior Product Specialist  
Specialized Communications  
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Next came the physical installation.

After the units passed QC testing, we delivered them to their facility. The CPUs were installed in racks in the central equipment room and the operator's stations were then installed in the control room using Specialized Communication's Remote Kits.

The remote kits transmit the SVGA, mouse, and keyboard signals over a single CAT5E network cable.

We prefer CAT5E over CAT5 because of its higher quality. The cable is a high quality network cable wired straight through (not in a crossover configuration). The remote kits are good for several hundred feet of cable run.

Care should be taken with any KVM extender, however, not to use more cable length than necessary. Make sure that you use the best quality cable you can get.

We find that if these things are not done, the video on the remote monitor can look very bad, and would be uncomfortable to view.

We also find that the resolution setting affects the total cable length that can be used and still have a good picture. The higher the resolution, the shorter the CAT5E cable needs to be.

The CPUs are mounted on VTR style rack slides that allow the units to be completely exposed without having to be detached from the rack, greatly simplifying maintenance and installation. If not for these slides, it would be very difficult to hold the units in place while trying to attach them to the rack. They are longer than one would expect and weigh about 80 lbs. each, therefore they also need to be in a rack that has rear rails. The slides also provide a place to attach to the rear rack rails. Considering their weight and size it would have taken 3 people to install them without the slides. With the slides, 2 people can very comfortably install them. Once installed, it takes very little effort to slide them in and out for maintenance.

The CPUs are 4 RU tall and have locking, removable drives that allow for easy system

maintenance. The drives are accessed from the front of the units, behind the locking, flip-down front panel.

The drive bays can be configured for redundant operation for extra peace of mind and drive storage can be expanded beyond the 80 GB standard storage if desired.

Dan Owens and Jim Carmel (Peak's engineering staff) were on hand and performed most of the installation with some minor guidance and suggestions from us. Wiring the units proved to be straightforward and simple for Dan and Jim, who are experts at this.

The CGs provide Component, Composite, and Y/C inputs and outputs. The proper I/O is chosen from a software configuration panel. The connections themselves are made to a set of labeled break-out cables. Care should be taken to read the labels carefully as some connectors do double duty depending on the settings in the control panel.

The CGs can be configured to self-key downstream or be externally keyed by the switcher. These units were configured to be externally keyed and therefore have the key out activated.

Timing the CGs is accomplished by software and is relatively straightforward. To make the timing simpler, the CGs have a variety of test patterns in addition to standard SMPTE bars. For example there is a special test pattern designed to assist in timing the alpha (key) out relative to the program out. This was very helpful and sped up the setup process.

Another helpful feature was part of the Specialized Communications Remote Kit. It allows the use of a local user station at the same time as the remote station. This let Dan and Jim set up a monitor, mouse, and keyboard in the machine room where they had their engineering waveform monitor and vectorscope and at the same time the user station in the control room was used to control the CGs from that end, giving faster access to the switcher.

The timing procedure is very straightforward and is much like timing a VTR to the switcher. Using house bars as a reference is always preferable but in a pinch camera bars from a timed studio camera will also work well.

We usually start by setting the switcher to perform a half wipe between the reference bars and the CG bars. Make sure the switcher starts with the reference bars up full screen (the T bar is totally bottomed) and wipes halfway to the CG. If you start with the CG and wipe to the reference bars, the switcher will try and lock to the CG, not the reference bars. This is bad because as you adjust the CG timing, it will look like the timing adjustments have no effect or that they are simply flopping 180 degrees out of phase and back. This makes timing the CG impossible. Instead, if you always start with the reference bars up full on the switcher, the switcher will lock to the reference bars. Then you will be able to see your adjustments. Then just continue your timing procedure as usual.

Keep in mind that you need to time each program output and key out for each output channel separately. The units timed in quickly and were available to the switcher soon after.

Dan (Peak's Chief Engineer) commented on how much he liked the output.

The installation went smoothly aside from a few minor cable issues. One in particular is worth mentioning. The cable connecting the key out of channel 1 on the VMP Studio was starting to go bad but hadn't completely failed. It seemed to us that the key was inverted on the switcher.

Continued on page 4

## Installation continued from pg. 3

After double and triple checking the switcher controls to make sure that they were set correctly we made sure that the CG was configured properly. We continued to troubleshoot until we looked at the key output on a monitor. The signal was jumping and rolling wildly. Small adjustments to the cable position made the signal change suggesting a bad cable. We then replaced the cable and all was well. The switcher keyed the CG perfectly.

## Opportunity

WPXI Television has an immediate opening for a full time maintenance technician. Job responsibilities include repair of Sony SP and SX field and studio equipment, Grass Valley and Philips switching equipment, video servers and computer systems. Job duties also include the operation of our satellite uplink truck. Must be able to make repairs to a component level. Applicant must be responsible, punctual, detail oriented and well organized in challenging situations. Overnight and weekend shifts will be required as necessary. SBE or FCC license preferred. Please send cover letter and resume to Engineering Manager, WPXI Television, 11 Television Hill, Pittsburgh, PA 15214. EOE.

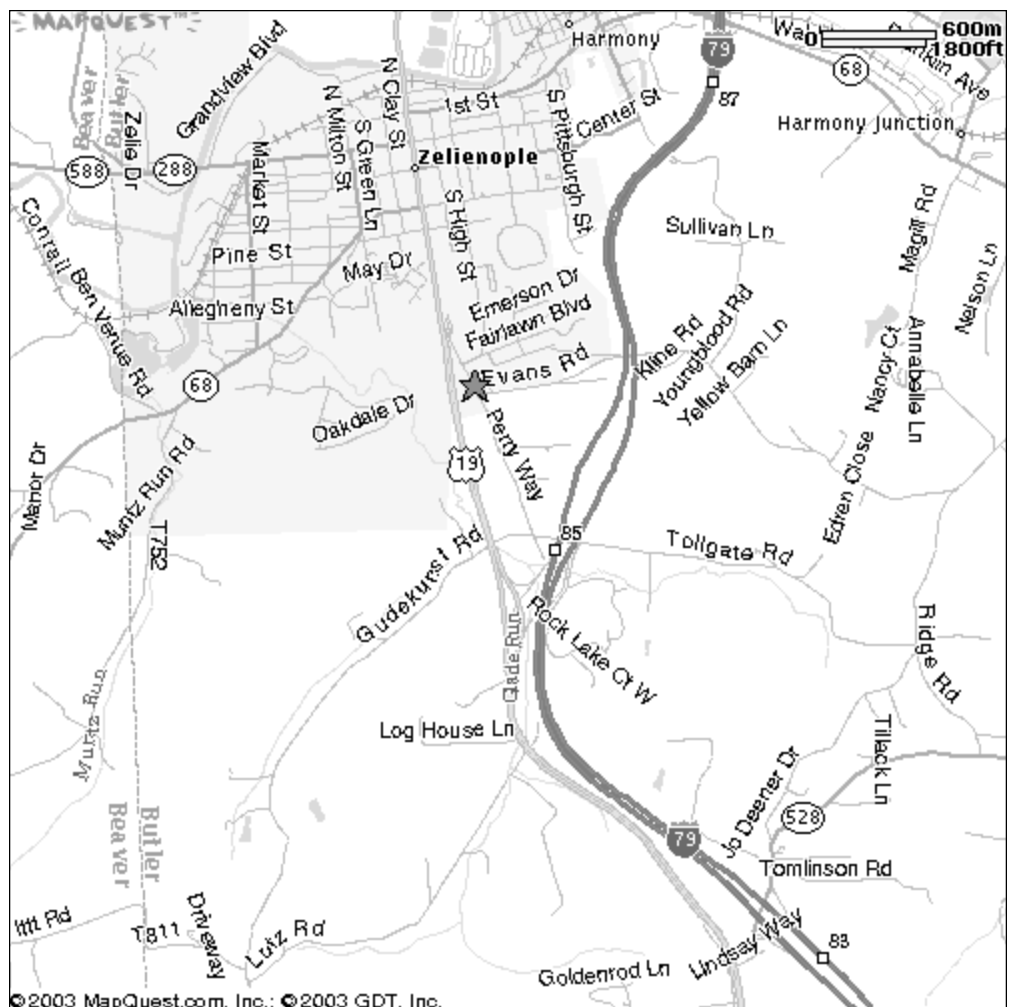
## Directions!

Directions to the April meeting at Armstrong Cable in Zelienople. Take I79 north to the Evans City exit (#83). Turn left and go a short distance to Rt 19 and turn right (north). Go 2.5 miles to an Exxon station on the right. Perry Way is the hard right turn immediately after the Exxon station (more than a 120 degree turn). Armstrong is at 531 Perry Way, about 500 feet down the road on the right.

If you get there so late that we have already moved to the headend, go just past Armstrong's office and turn left onto Evans Road. Look for Youngblood Rd about a mile out. Turn left, go past the end of the county road, keep going on the gravel lane until you get to the tower.



*Ron DeBellis of the Expomart shows Kim Cannon, SBE Chapter 20 Convention Chairperson, where to sign the contract for this year's annual convention which will be October 2nd.*



*Map to Armstrong Cable in Zelienople – the location of our April meeting.*



## Distributed Transmission and RF Watermarks

LAWRENCE, Pa. (March 25, 2003) - Axcera, demonstrated two new digital television technologies at the annual meeting of the Advanced Television Systems Committee March 11 in Washington, D.C.

With the DTV roll out in full swing, broadcasters are beginning to examine the challenge of replicating existing analog service areas with digital signals. This can be difficult, especially with challenging terrain or when UHF DTV channels must replicate analog VHF coverage. Distributed Transmission, which is a Candidate Standard undergoing ATSC consideration, addresses this problem by allowing the use of multiple on-channel transmitters to target population centers and improve coverage in weak signal or shadowed areas, without the need for additional channels and translators.

Axcera showed the DXA2B Distributed Transmission Adaptor providing SMPTE 310 streams to two "slave" DT2B modulators. The outputs of the slave modulators were combined and fed to both a legacy receiver and an advanced receiver prototype, simulating reception in signal overlap areas. Axcera is the only supplier to implement an operational Distributed Transmission Network using the ATSC signal. Penn State's WPSX-DT has chosen Axcera to implement this technology in central Pennsylvania.

Associated with the distributed transmission concept, RF Watermark Technology inserts a low-amplitude symbol sequence into the 8VSB signal to identify the digital transmitter broadcasting the signal. The RF Watermark system was developed to allow field test equipment to identify which slave transmitters are being received, and to detect the separate impulse responses of each slave transmitter at a particular receiving location. The RF Watermark may also be used to identify transmitters that are well below normal reception threshold, for example, from a source of co-channel interference.

Broadcast consultant S. Merrill Weiss, of The Merrill Weiss Group, who developed the underlying principles of Distributed Transmission, feels strongly about the adoption of these technologies. According to Weiss, "Distributed Transmission provides broadcasters with many opportunities to overcome propagation obstacles, to maximize coverage and service, to achieve set top reception, and to deliver more uniform signal levels, all without requiring additional spectrum or causing new interference."

Other new technologies are also driving the development of distributed transmission. Robust modulation techniques, also known as Enhanced VSB, are supported in the ATSC candidate standard for Distributed Transmission. The architecture of the Distributed Transmission Adaptor can be used as the foundation for implementation of Enhanced VSB, even in single transmitter systems.

Additional demonstrations of both the distributed transmission and RF watermark technologies will be held in the Axcera booth at NAB 2003 on April 7-10.

## Agilent Technologies plans Seminar

Tim Brennan Field Engineer Agilent Technologies  
tim\_brennan@agilent.com

Agilent Technologies is planning on hosting a no cost Analog/Digital Design Validation Seminar in Pittsburgh. Topics will include:

1. Understanding Oscilloscope Measurements: How various probing techniques affect the operation of the target system. Also, a discussion on system bandwidth considerations.
2. Mixed Signal Analysis: A discussion of solutions for debug and validation of mixed analog and digital design including debugging a DDR SDRAM and a PCI bus device with a MSO.
3. Logic Probing Technologies: The effects that various probing technologies have on signal integrity, board layout, and usability.
4. Introduction to Signal Integrity: A primer addressing when you should consider signal integrity, and what methods can be used to minimize the effects.

Live demonstrations will accompany the lecture material, and lunch will be provided.

To determine the level of interest, and if and where to hold the seminar, please respond by email to karen\_patterson@agilent.com

1. Do you think you would attend this seminar?
2. How many other people from your company do you think would attend?
3. Where in the Pittsburgh area would be the best location?



*Don "Maxx" Thomas puts the transmitter GUI through its paces.*

Missed NAB?  
**Join us for the upcoming SBE Convention 2003**

Mark your calendars now for the annual tri-state area's largest video show!

- Meet local vendors & manufacturers.
- Get hands on product demonstrations.
- Free technical sessions.
- Learn from respected peers in our field with hands on topics.
- Technical sessions
- October 2, 2003
- Pittsburgh Expo Mart (Monroeville)

You will be able to preregister on-line later in the summer.

Greetings,

Things are off to a great start for the upcoming convention! The SBE Board Members, including past Convention Chair Tom Bills, held our first convention meeting and some great ideas are coming your way.

HDTV is here in our hometown and that is an exciting development. We are hoping to receive all local HDTV transmissions at the show. Keep your fingers crossed because this is still in the works. Please contact me for additional details pertaining to the HDTV exhibit.

Exciting speakers and technical sessions are already scheduled for this year's convention, and we are looking for more. Learn from award-winning filmmaker Rick Sebak "Pittsburgh's voice," Alex Lindsay, special effects artist for Star Wars Episode 1, and Rich Pelzar from Adobe Systems. Also, look for an exhibit documenting Pittsburgh's role in the history of broadcasting. Pittsburgh was the first to broadcast radio and television, and public broadcasting started right here! Learn more about our roots at the upcoming SBE Convention 2003.

I am pleased to announce the SBE Convention 2003 Committee. The variety of professionals in video will add more ideas, new perspectives, and experience.

*SBE 2003 Convention Committee:*

*Art Institutes of Pittsburgh – Todd Kreps, CDR Systems, Inc. – Kim Cannon, Comstock Media – Brian Sales, Panasonic Broadcast & Television Systems Co. – Sandy Pomerantz, RPC Video – Tom Bills, Tri-state Video – Lori Keffalas, & WQED Multimedia – Paul Byers.*

We are now taking applications for technical presentations. Please contact Blake Richert, SBE Chapter 20 Vice Chair or me to receive an application.

Special thanks to everyone who has volunteered their time to better the Pittsburgh's SBE Convention 2003.

See you there!

Kim Cannon  
SBE Pittsburgh Chapter 20  
Convention 2003