THE HARRIS CONNECTION

Volume 1, Number 3 Spring 1988

World's first digital solid-state transmitter:
"HARRIS' DX-10 SOUNDS AS GOOD AS FM!"

When Des Moines, Iowa's KIOA turned on its new Harris DX-10, 10 kilowatt digital solid-state AM transmitter on Sept. 8, 1987, it became the world's first digital AM station.

And on-the-air results?

"Believe you me: We are impressed," says Duke Wright, president of Midwest Communications, Inc. in Green Bay, Wisconsin—the group that owns KIOA and seven other stations.

"The DX-10 is great. You can modulate the daylights out of it—125% peak capacity at 11 kWs, 140% at 10 kWs. No other transmitter is capable of such high average modulation.

"All-solid state is a plus. The DX-10 replaced a 10 kW plate modulated Collins installed in 1971, and tube costs have been a big factor. With the DX-10, they're a thing of the past.

"We're noting a substantial power cutback, and the cabinetry's impressive. The DX-10 looks good and it works good," he adds.

Mr. Wright's feelings are echoed by Steve Konopka, director of engineering for the group:

"When we first went on the air with the DX-10, we received phone calls from engineers of competing stations and listeners asking what we had done," he notes. "The improved sound from extremely low THD and IMD was that noticeable—even on average receivers!

Steve describes installation as straightforward and problem-free, facilitated by convenient AC power and remote control interconnects: "I handled the power wiring and was surprised by the permissible small size of copper wires. A conventional 10 kW transmitter would need much larger cables!"

And John Kosobucki, KIOA's chief engineer notes that "the DX-10 doesn't try to overload or shut down. It just works. In fact, it's the only transmitter I've seen that doesn't try to do anything wierd!"

Not only has a lot of routine maintenance been eliminated, but John notes that performance is always consistent: "We're not even aware of power line sags. Plus, the DX-10 is transparent to whatever you feed it. We're picking up high end that we didn't hear before.

"The DX-10 is well-protected against lighting. During the first storm, it just throttled a little then came back up. It's efficient. Our old Collins was pulling 33 kWs, the DX-10 averages 12 to 15. In fact, the box isn't giving us any problems at all. It doesn't burp." he adds.

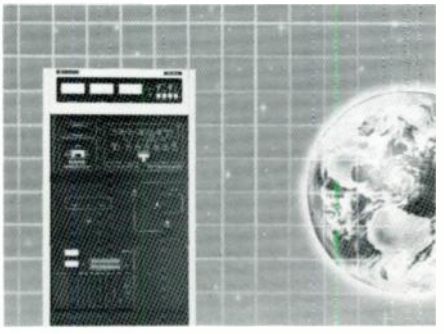
Steve Mathews, KIOA's program director, adds: "The DX-10 will make radio manufacturers stand up and take notice that AM radio is not dead!"

FM-35K: "EVEN OUR LISTENERS NOTICED!"

"When we installed an FM-35K at KFKF-FM, Kansas City, we expected broadcast range and audio quality to improve substantially from our old RCA. **But we didn't expect our listeners to comment,**" says Richard Wholey, VP and Director of Engineering for Sconnix Broadcasting Company.

"We've received many calls from new listeners now able to receive us, and from present listeners who've noticed the improvement in sound.

"We considered every transmitter above 31 kW but chose the Harris FM-35K. First, we've always had a good relationship with Harris—good equipment reliability and excellent technical support. Second, we were impressed by the technology—it scored the highest with us in design reliability and latest diagnostic features. Third, we appreciated the FM-35K's high audio quality. And fourth, the 80% operating efficiency gives us power savings."



LISTENERS' CHOICE

For over 30 years, Harris has maintained an on-going commitment to the high power FM broadcaster—a commitment to leadership products, unparalleled service and support and training.

Discover what Sconnix has learned about Harris FM transmitters—the choice of 40 percent of all U.S. FM broadcasters. For your free FM-35K brochure, simply check the appropriate box on the attached business reply card. Thank You!

Act by April 30, 1988!
ORDER A DX-10 OR FM-35K AND GET FREE CHECK-OUT!!!!

If your station's planning to order either the Harris DX-10, 10 kW digital solid-state AM transmitter or the FM-35K, 35 kW FM transmitter, you'll want to act by April 30, 1988.

Any U.S. station ordering by that date will receive an after-installation, on-site check-out by a Harris field service engineer at absolutely no charge.

During check-out, the Harris engineer will verify that your transmitter has been properly installed; conduct a thorough examination of the transmitter; perform the initial turn-on and check-out, and familiarize the station engineer with the transmitter.

For more information on either transmitter or a visit from your Harris sales manager, simply check the appropriate box on the attached card and return it to Harris, or phone the Radio Sales Department at 217/222-8200.

SPRING TRAINING OPPORTUNITIES AT HARRIS!

If you're a station engineer, have you ever wanted the opportunity to spend several days mastering the ins and outs of a particular piece of equipment or sharpening your knowledge of RF or transmission systems?

If you're a general manager, have you ever wished there were an easy way to ensure your technical staff had the latest know-how to even better ensure that your station stays on the air?

In either case, you'll want to know about eight comprehensive courses that Harris will offer at its Quincy, Illinois Broadcast Technology Training Center from April 1, 1988 through June 30, 1988.

The class line-up will include Harris' AM and FM Transmission Workshops and RF Circuits I and RF Circuits II courses, designed to be beneficial regardless of the manufacturer of a station's RF equipment. Four classes focusing on specific Harris radio transmitters and facilities control systems also will be offered.

Joining the roster will be an all-new five-day training program on the Harris DX-10—the world's first and only 10 kilowatt AM transmitter which combines digital and solid state technologies.

The course schedule follows:

—AM Transmission Workshop: April 5 through 7;

—FM Transmission Workshop: April 13 through 15;

—MW 5/10 Series: May 2 through 6;

—9135 Facilities Control: May 23 through 25;

—RF Circuits I: June 13 through 17;

—RF Circuits II: June 20 through 24;

—9100 CRT/Transmitter: Satellite: June 20 through 23;

—DX-10: June 27 through July 1.

All courses will be taught by Harris' Broadcast Technology Training Center Staff—field engineers with educational expertise, and will combine theory and practical "hands-on" training.

For complete course outlines and enrollment information, please check the appropriate box on the attached Business Reply Card. Thank you!

ED PRYOR JOINS RADIO SALES FORCE

Edward J. (Ed) Pryor, Jr., who landed his first radio job at age 18 as a DJ in Tulsa, Oklahoma, and who has been a radio engineering consultant since 1983 when he formed Broadcast Technologies, Inc. in Arlington, Texas, has joined Harris' radio sales force as district sales manager for Texas and New Mexico.

"I was the kind of kid who was always getting kicked out of radio stations until I was old enough to be offered a job," he says. "By age 18, I was Number One with Tulsa housewives doing country radio when country wasn't considered cool."

Born in Muskogee, Ed received his education at the Missouri School of Mines and the University of Tulsa. As an avionics technician in the U.S. Air Force, he received additional technical training, and entered the engineering side of radio upon leaving the service in 1972.

Moving to Texas 15 years ago, he has held engineering positions with stations in Dallas, Arlington and San Antonio. An SBE Certified Senior Engineer, he was a founding member of SBE Chapter 67 at Dallas in 1977.

For several years he authored a general information column for **ID Magazine,** dealing with technical aspects of radio from subchannel generators to antenna systems.

With a rare combination of business expertise, on-air DJ and reporter's experience and engineering, Ed says he's really looking forward to showing Texas and New Mexico radio stations what Harris can do for them.

TOM RANSON NAMED DSM FOR NORTHWEST

Thomas R. (Tom) Ransom, who became involved in radio in the mid-70s when he developed a minicomputer billing and traffic package for radio stations, has joined Harris as radio district sales manager for the Pacific Northwest. His territory includes Alaska, Washington, Oregon, Idaho, Montana Wyoming, Northern Nevada and Northern California.

Tom's interest in digital technology began as an Explorer Scout during his sophomore year in high school. It's an interest that grew when he worked as a programmer and systems analyst while attending Purdue University, Lafayette, Indiana, as a business administration and accounting major.

After college, his work as a computer specialist led to the development of systems for radio stations. His interest in radio grew, and Tom joined Harris' Broadcast Division in 1980 as manager of program development, and later product marketing manager, for radio computer and control systems. In 1986 he joined IGM Communications, Inc., as director of sales and marketing.

With a background that combines digital, engineering and business expertise, Tom has presented programs on digital audio technology to several SBE chapters, and has authored articles for **Radio World** and other broadcast publications.

"The radio industry has changed drastically in recent years, both economically and technically," Tom says. "As a Harris sales manager, I'm looking forward to working with broadcasters and giving them access to the Broadcast Division's complete technical resources and expertise."

TED WAHLMANN TO MANAGE GOVERNMENT SALES

Theodore R. (Ted) Wahlmann has been promoted to the new position of manager - government sales administration. Ted will establish a formal consultants' relations program and coordinate the division's response to all requests for radio equipment bids from U.S. governmental agencies.

A native of St. Louis, Missouri, Ted received a bachelor of science degree in electrical engineering and master of science in engineering administration degree from Washington University.

In 1967, he joined F & M Systems, based in Dallas, Texas, as a senior project engineer. During his tenure at F & M, Ted coordinated projects worldwide, ranging from KMOX-TV, St. Louis, to ABC, New York, to The Broadcast House in Jerusalem, to four years in Johannesburg, Africa, where he designed and constructed the SABC-TV Center.

Joining Harris in 1977, Ted has worked as a project engineer in the systems group, and as a senior technical support specialist in the international sales, then the video sales departments. He joined the domestic radio sales staff in May 1987.

HARRIS AT YOUR SERVICE:

HOW MAY WE HELP YOU?

Please take a few moments to complete, fold, staple and return this card to know how we can best meet your needs. Thank you.

Name _____

Call Letters _____ Phone _____
Area Code/Number

Address _____

City _____ State _____ Zip _____

NEW EQUIPMENT INFORMATION: Please check for any product information you wish to receive:

( ) AM Transmitters; Please indicate power level: _____

( ) FM Transmitters; Please indicate power level: _____

( ) Audio Consoles

( ) AM Phasors

( ) FM Antennas

( ) Other: Please list: _____

HARRIS RADIO DISTICT SALES MANAGER CALL REQUEST: If you would like your Harris Radio Representative to call on you, please check: ( )

1988 NAB NEW PRODUCT INFORMATION CONTEST: Please indicate the product you believe Harris most likely will introduce during NAB that has not been pre-announced: _____

BROADCAST TECHNOLOGY TRAINING CENTER PROGRAMS (Page 2): Please check any Broadcast Technology Training Center program about which you would like more information:

( ) **AM Transmission Workshop:** April 5 - 7

( ) **FM Transmission Workshop:** April 13 - 15

( ) **MW 5/10 Series:** May 2 - 6

( ) **9135 Facilities Control:** May 23 - 25

( ) **RF Circuits I:** June 13 - 17

( ) **RF Circuits II:** June 20 - 24

( ) **9100 CRT/Transmitter/Satellite:** June 20 - 23

( ) **DX-10:** June 27 - July 1

NO POSTAGE
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UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1 QUINCY, IL 62301

POSTAGE WILL BE PAID BY

Harris Corporation, Broadcast Division
P. O. Box 4290
Quincy, IL 62305-9990

Attn: Radio Sales

MOV — The Electronic Equipment Saver

By Dave Kobe
Manager - Broadcast Technology
Training Center

Power line transients are a major threat to any piece of electronic equipment, but their destructive nature can be minimized very easily—with a little know-how.

There's a lot of confusion centering around line surges and transients and particularly on how to control them. Even though most of the time we have no means to eliminate the source of these problems, there are several methods to protect our equipment from them. We will focus on the most satisfactory—the MOV.

The Problem — Line Transients

First, the problem. Line transients can vary from a few hundred volts to many thousands of volts and can range from a several nanosecond duration to many milli-seconds. Lightning strikes several miles away can cause voltage spikes of thousands of volts. Large inductive surges from industrial motors and transformers, etc. cuase all kinds of line havoc. Obviously, these surges are very destructive and millions of dollars are spent annually repairing damaged equipment.

The Solution — The MOV

Now, the cure. As mentioned, several devices exist to eliminate these problems. Back-to-back zener diodes, silicon avalanche diodes, dual disc capacitors, gas discharge tubes and MOVs. The metal-oxide-varistor is the most practical because it is relatively inexpensive, easy to acquire, simple to install and most importantly, it really works for the vast majority of all the surges and transients that can occur on your AC line.

The MOV is basically a bi-directional clamp. Clamping levels range from as low as 14V to as high as 1,350 volts. It can protect against transients as short as 25 nanoseconds and can handle surge currents up to 6500 amps.

Physically, the MOV looks like a disc capacitor with an average size similar to a nickel. Various manufacturers produce them and they are readily available. Usually the AC operating voltage is part of the device number. For example, a GE device number is V130LA10A. The V130 is the AC voltage range in which the MOV is inactive. You would use this device with your 117 VAC equipment. You would choose a V250LA40A to use on 220V equipment.

Because MOVs do come in a variety of current surge ratings, you will want to choose the ones you feel are appropriate for your equipment.

Straightforward Installation

Installation is very simple. For full protection on 117 VAC equipment, use three MOVs. Install them inside the equipment where the AC line cord terminates or inside multiple outlet strips. Place one directly across the two AC wires, and one from each AC wire to ground. All current Harris transmitters have these installed at various locations on the inside of the main cabinets.

If you have an older transmitter or any transmitter that does not have this protection, installation of these devices is one of the best preventive maintenance measures you can take to prevent future problems. It's as effective as adding Heet to your auto gas in sub zero weather!

When installing MOVs on 3-phase power lines in your transmitter, place them from phase to phase, and from each phase to ground (six in all).

One final note: MOVs are not the ultimate cure-all for all transient problems. However, they are very effective and provide a tremendous return for a small investment.

(NOTE: If you'd like additional information on MOVs, you may contact General Electric's Applications Department at (201) 685-6456.)

AND THE WINNER IS...

Our thanks to readers who entered our 65th anniversary "Have Your Cake And Eat It Too" Contest by attempting to name the piece of equipment—the Gates Transcription Turntable—in the last issue of THE HARRIS CONNECTION.

And our winner, whose name was drawn by Andrea Fletcher, daughter of radio sales coordinator for the Western United States Jenny Fletcher, is J.T. Whitlock, president/general manager/co-owner of Radio Stations WLBN-AM, WLSK-FM in Lebanon, Kentucky. An angel food cake with brown sugar icing—winner's choice!—was delivered on Super Sunday. The cake's inscription? "Contest Winner," Mr. Whitlock's request because he said he had never won anything before in his life and wanted to confirm (in Harris blue icing) that he *had* won. The station has Gates/Harris equipment with a 37-year old BC-1F and

an FM-2.5K transmitter. Congratulations!

Some of our favorite answers? "Disco board from the Hard Rock Cafe in New York," "I say it is a Gates Electrograph," "Remote control," "Spin-a-twin," and "I don't know but it's B4 my time."

NAB 88 FANFARE!

HARRIS TO ROUND OUT HIGH POWER FM TRANSMITTER LINE; INTRODUCE DX-25

Exciting new radio product introductions will highlight Harris Broadcast Division's 1988 exhibit at the National Association of Broadcasters (NAB) Convention April 9-13 at Las Vegas.

You won't want to miss the opportunity to visit the Harris exhibit in Booth 503 to see Harris' latest introductions and enhancements to its high power family of FM transmitters and its new DX-25, 25 kilowatt digital solid-state AM transmitter!

Harris will round out its line of high power FM transmitters with the introduction of new 20 and 30 kilowatt models, and will introduce an enhanced cooling system with a low noise blower to its 25 kW FM transmitter.

With the introduction, Harris will be able to offer FM transmitters in 20, 25, 30 and 35 kW power levels, with dual combinations available.

In AM, Harris will introduce the DX-25, a 25 kW digital solid state transmitter featuring the patented digital modulator and offering unprecedented levels of overall efficiency and audio performance.

Harris also will exhibit 1 kW and single-phase 5 kW AM transmitters from its SX-A series. These transmitters—also available in 2.5 kW and standard three-phase 5 kW models, feature Harris' patented polyphase pulse duration modulation. The FM-3.5K, 800 through 4000 watt FM transmitter; FM antennas and the Gold Medalist Audio Console also will be displayed.

AND, WITHOUT FANFARE...

There's even more! Harris also will introduce several new products which will NOT be announced before NAB, and it's your chance to win!

On the form attached to this newsletter, simply write your guess of one new radio product Harris will introduce without pre-show fanfare and return it by April 2, 1988. If your guess is correct, you will be eligible to win a tuition waiver to attend or send your designee to the Broadcast Technology Training Center course of your choice!

The winner will be announced at NAB and in the next issue of THE HARRIS CONNECTION.

Harris Corporation, Broadcast Division
P. O. Box 4290
Quincy, Illinois 62305-4290

Mr. Barry Mishkind
V.P./Tech. Dir., KFXX Radio
3222 South Richey Avenue
Tucson, Arizona 85713

LIMITED TIME DX-10, FM-35K CHECK-OUT OFFER!