



30TH ANNUAL  
University of Wisconsin—Extension

**BROADCAST ENGINEERING  
MANAGEMENT**

September 24, 1984

In conjunction with

**BROADCASTERS'  
CLINIC**

September 25, 26, 27, 1984



# THE UNIVERSITY OF WISCONSIN—EXTENSION PROUDLY OFFERS...

... the 30th Annual **BROADCASTERS' CLINIC**, long considered a "must" within the industry for broadcast engineers eager to remain on the leading edge of their profession.

This year **BROADCASTERS' CLINIC** is being held in conjunction with a **BROADCAST ENGINEERING MANAGEMENT Seminar** on Monday, September 24, 1984. This Seminar is designed to assist the broadcast engineer in effectively meeting the growing challenges of communicating with station management, supervising staff engineers, and handling the increasing variety of complex decision-making challenges that face engineering management today.

**BROADCASTERS' CLINIC 1984** on September 25, 26 and 27, 1984, will feature the most impressive array of speakers, topics and exhibits to date. Over two dozen leading engineers, technologists, researchers and administrators from around the country will address a number of topics of vital concern to the broadcast engineer: dealing with emerging technologies; interpreting recent FCC decisions; designing broadcast facilities; and understanding state-of-the-art research in the field of broadcast engineering. The popular "nuts and bolts" broadcast engineering forum will return in an expanded format this year. Industry exhibits will be extensive and varied.

Plan to attend both **BROADCASTERS' CLINIC** and **BROADCAST ENGINEERING MANAGEMENT** this year. **Help us celebrate our 30th Anniversary—30 years of valuable education and service to the broadcast engineering profession.**



## GENERAL CONFERENCE INFORMATION

### DATES

**BROADCASTERS' CLINIC**, Tuesday, Wednesday and Thursday, September 25, 26, 27, 1984.

**BROADCAST ENGINEERING MANAGEMENT**, Monday, September 24, 1984.

### LOCATION

All sessions of both **BROADCASTERS' CLINIC** and **BROADCAST ENGINEERING MANAGEMENT** will be held at the Holiday Inn Southeast, Highway 12 and 18 at I-90, Madison, Wisconsin, 53704. Phone: (608) 222-9121.

### FEE

**BROADCASTERS' CLINIC**—\$100. Fee covers program materials, 3 continental breakfasts, 3 luncheons, 3 break refreshments and 2 evening receptions with hot hors d'oeuvres. The Tuesday evening dinner is optional at an additional charge of \$12.

**BROADCAST ENGINEERING MANAGEMENT**—\$50. Fee covers program materials, a continental breakfast, luncheon, break refreshments, and an evening reception with hot hors d'oeuvres.

**BROADCASTERS' CLINIC** and **BROADCAST ENGINEERING MANAGEMENT**—\$135.

You are entitled to an 80% refund for these conferences if cancellations are received prior to September 17, 1984. Enrollees who do not cancel are obligated for the full fee. Substitutions may be made at any time.

### ACCOMMODATIONS

Please make your own room reservations with the Holiday Inn Southeast, Highway 12 and 18 at I-90, Madison, Wisconsin, 53704. Phone: (608) 222-9121. We suggest that you make your reservations before September 1, 1984, while discounted rooms are being held for the conferences. Please specify that you are attending **BROADCASTERS' CLINIC** and/or **BROADCAST ENGINEERING MANAGEMENT**. If you are handicapped and desire special accommodations, please advise us at least two weeks before the conferences. Requests will be kept confidential.

### CREDIT

Conference enrollees can earn the following Continuing Education Units (CEUs) from UW-Extension: **BROADCASTERS' CLINIC**, 2.3 CEUs; **BROADCAST ENGINEERING MANAGEMENT**, 1 CEU; **BROADCASTERS' CLINIC** and **BROADCAST ENGINEERING MANAGEMENT**, 3.3 CEUs.

### INFORMATION

For further conference or exhibitor information, contact Don Borchert, Director of Engineering, WHA Radio and Television, 7136 Vilas Communication Hall, 821 University Avenue, Madison, Wisconsin 53703. Phone: (608) 263-2157.



## PROGRAM: BROADCAST ENGINEERING MANAGEMENT SEMINAR

Monday, September 24, 1984

- 7:45 a.m. Registration and Continental Breakfast
- 9:00 INTRODUCTION AND WELCOME  
*Don Borchert*, Director of Engineering, WHA Radio and Television, Madison, WI
- 9:30 LET'S TALK TECHNICAL MANAGEMENT  
*Professor Dale D. McConkey*, University of Wisconsin—Extension, Management Institute, Madison, WI
- 12:00 Luncheon and Address:  
EVERYBODY'S FAVORITE CHIEF ENGINEER  
*John Cummuta*, Management Editor, *Radio World*; and Operations Manager, WCFL, Chicago, IL
- 2:00 p.m. FINANCE AS IT APPLIES TO BROADCAST ENGINEERS  
*Harrison Klein*, Director of Engineering, Westinghouse Broadcasting, New York, NY
- 2:45 Break
- 3:00 PROBLEM SOLVING THROUGH CASE STUDIES  
Engineering Panel:  
*James Wulliman*, WTMJ, Milwaukee, WI  
*Elmo Reed*, Post Corporation, Green Bay, WI  
*Harry Priester*, WLS-FM, Chicago, IL

*Mark Durenberger*, Director of Technical Development, Hubbard Broadcasting, St. Paul, MN  
*Garrett Lysiak*, FCC, St. Paul, MN

4:30

Reception and Cash Bar

7:30

ENGINEERING MANAGEMENT RAP SESSION

Engineering Panel:

*James Wulliman*, WTMJ, Milwaukee, WI  
*Elmo Reed*, Post Corporation, Green Bay, WI  
*Harry Priester*, WLS-FM, Chicago, IL  
*Mark Durenberger*, Director of Technical Development, Hubbard Broadcasting, St. Paul, MN  
*Garrett Lysiak*, FCC, St. Paul, MN



## PROGRAM: BROADCASTERS' CLINIC

Tuesday, September 25, 1984

- 7:45 a.m. Registration and Continental Breakfast
- 9:00 INTRODUCTION AND WELCOME  
*Don Borchert*, Director of Engineering, WHA Radio and Television, Madison, WI
- 9:30 TIME DELAY SPECTROMETRY: PRINCIPLES, INSTRUMENTATION, AND APPLICATIONS  
*Jim Brown*, Chief Engineer, Bridgewater Sound, South Holland, IL
- 10:15 Break
- 10:30 REBUILDING THE AM SYSTEM: A CASE STUDY  
*Doug C. McDonell*, Broadcast Engineering Consultant, Madison, WI
- 11:15 FCC UPDATE  
*Garrett Lysiak*, FCC, St. Paul, MN  
*George Sklom*, FCC, Chicago, IL

12:00

Luncheon and Address:

KU BAND SATELLITE DELIVERY SYSTEMS  
*Donald W. Kivell*, Director of Plant Communications, NBC, New York, NY

2:00 p.m.

SWEEPING FM AND TELEVISION ANTENNAS

*Harrison Klein*, Director of Engineering, Westinghouse Broadcasting, New York, NY

2:45

OP AMPS: HANDS ON TRICKS FOR HANDS OFF OPERATION

*Mark Durenberger*, Director of Technical Development, Hubbard Broadcasting, St. Paul, MN

3:30

A COMPARISON OF TWO AM STEREO SYSTEMS

*Donald L. Markley*, Consulting Engineer, Peoria, IL

4:30

Reception, Cash Bar and Equipment Exhibit

6:00

Dinner (optional)



## Wednesday, September 26, 1984

- 7:45 a.m. Continuing Registration and Continental Breakfast
- 8:30 INTERFACING THE NATIONAL WEATHER WIRE SERVICE TO THE 21ST CENTURY  
*Mike Henderson*, Group Chief Engineer, Hedberg Broadcasting, Blue Earth, MN
- 9:15 A DIAGNOSTIC SYSTEM FOR FM TRANSMITTERS USING A VIDEO SCREEN  
*James Tucker*, Design Engineer, Broadcast Electronics, Inc., Quincy, IL
- 10:00 Break
- 10:15 AN INTRODUCTION TO IC DESIGN AND MANUFACTURE: AM STEREO CHIP  
Motorola Semi-Conductor, Mesa, AZ
- 11:15 PULSE DURATION MODULATION  
*Grant Bingeman*, Design Engineer, Continental Electronics, Dallas, TX

## Thursday, September 27, 1984

- 7:45 a.m. Continental Breakfast
- 8:30 PREVENTING TERRESTRIAL INTERFERENCE IN TVRO APPLICATIONS  
*William Johnson*, Chief Engineer, Microwave Filter Company, East Syracuse, NY
- 9:15 DE-MYSTIFYING A/D AND D/A CONVERTERS  
*Pete Thorpe*, Chief Engineer, B-108 Radio, Anoka, MN
- 10:00 Break
- 10:15 IMPROVED UHF COVERAGE THROUGH CP OR DUAL ANTENNAS  
*Jim Seamon*, TVX Corporation, Virginia Beach, VA

- 12:00 Luncheon and Address:  
IN THE FOREFRONT OF TECHNOLOGY  
*Dr. Frank Marlowe*, RCA Laboratories, Princeton, NJ
- 2:00 p.m. AUDIO PROCESSING AND PEAK OVERMODULATION IN FM BROADCASTING  
*Nigel Branwell*, President, Audio and Design, CALREC, Bremerton, WA
- 2:45 PEAK OVERSHOOTS IN FM MODULATION MONITORS  
*Joseph Wu*, President, TFT, Santa Clara, CA
- 3:30 SECOND GENERATION TECHNIQUES FOR AM STEREO EXCITER DESIGN  
*Stan Salek*, AM Stereo Design Engineer, Broadcast Electronics, Inc. Quincy, IL
- 4:15 Reception, Cash Bar and Equipment Exhibit
- 6:30 BROADCAST ENGINEERING FORUM (Nuts and Bolts Session)  
*Stephen Brown*, Moderator, WLTE, Minneapolis, MN

- 11:15 LINEAR AND NON-LINEAR DISTORTION  
*Hans Schmid*, ABC Engineering, New York, NY
- 12:00 Luncheon and Addresses:  
PRACTICAL CONSIDERATIONS FOR UHF CIRCULAR WAVEGUIDE  
*Gaeza Di Enes*, Senior Advisor, Andrew Corporation, Chicago, IL
- RF SUBSYSTEMS IN SUB ATOMIC PARTICLE RESEARCH  
*Quentin Kerns*, Instrumentation Group Leader, Fermi Laboratory, Batavia, IL
- 3:00 p.m. Adjournment



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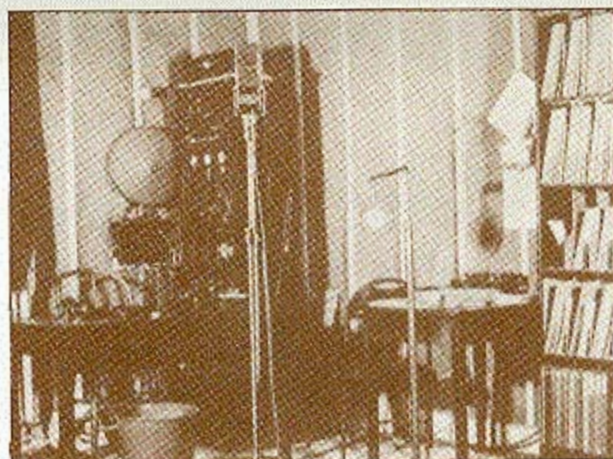
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## SPECIAL 1984 CONFERENCE FEATURES

New roomier conference location  
Expanded conference program  
Enlarged exhibit area  
Attendance certificates  
Door prizes



## 1984 PROGRAM COMMITTEE

*Don Borchert*, WHA Radio and TV, Madison, WI  
*Elmo Reed*, Post Corporation, Green Bay, WI  
*Warren Shulz*, WFYR, Chicago, IL  
*Ray Hernday*, WTMJ, Milwaukee, WI  
*Stephen Brown*, WLTE, Minneapolis, MN  
*Harry Priester*, WLS-FM, Chicago, IL  
*John Freberg*, WXRT, Chicago, IL

## WE'VE COME A LONG WAY...

### 9XM: "The Oldest Radio Station in the Nation"

1914	2000 watts	475 meters	1927	750 watts	940 kilocycles
1915	2000 watts	475 meters	1927	750 watts	900 kilocycles
		750 meters	1928	750 watts	570 kilocycles
1916	4000 watts	1700 meters	1929	750 watts	940 kilocycles
1917	2000 watts	1000 meters-code	1932	1000 watts	940 kilocycles
		1300 meters-voice	1934	2500 watts	940 kilocycles
1919	2000 watts	1000 meters-code	1936	5000 watts	940 kilocycles
		1300 meters-voice	1941	5000 watts	970 kilocycles
1920	400 watts	475 meters-code	1969	5000 watts	970 kilocycles
		800 meters-voice			
1921	400 watts	485 meters			

### WHA-AM

1922	500 watts	485 meters-noon
		360 meters-evening
1923	500 watts	485 meters-agriculture and weather
		360 meters-other
1924	500 watts	275 meters
1925	750 watts	535 meters
1927	750 watts	560 kilocycles
		590 kilocycles-special

### WHA-FM

1947	1 kilowatt	88.7 megacycles
1969	10 kilowatts	88.7 megacycles

### WHA-TV

1954	12 kilowatts
1984	759 kilowatts



### 9XM-WHA

#### "The Oldest Station in the Nation"

On this campus pioneer research and experimentation in "wireless" led to successful transmissions of voice and music in 1917, and the beginning of broadcasting on a scheduled basis in 1919.

Experimental station 9XM transmitted telegraphic signals from Science Hall until 1917 when it was moved to Sterling Hall. In that year Professor Earle M. Terry and students built and operated a "wireless telephone" transmitter.

In 1918, during World War I, when other stations were ordered silenced, 9XM operated under special authorization to continue its telephonic exchange with U.S. Navy stations on the Great Lakes. After the war, programs were directed to the general public.

The WHA letters replaced the 9XM call on January 13, 1922. Thus, the University of Wisconsin station, under the calls 9XM and WHA, has been in existence longer than any other.

Marker Erected 1958



# REGISTRATION FORM

## BROADCASTERS' CLINIC

September 25, 26, 27, 1984

Fee: \$100

(T-43-5044-0278)

## BROADCAST ENGINEERING MANAGEMENT

September 24, 1984

Fee: \$50

(T-43-5044-0277)

## BROADCASTERS' CLINIC and BROADCAST ENGINEERING MANAGEMENT

September 24, 25, 26, 27, 1984

Fee: \$135

Holiday Inn Southeast, Highway 12 and 18 at I-90, Madison, Wisconsin 53704 / (608) 222-9121

Social Security Number: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

(Not mandatory—used only to ensure accessibility and accuracy of your educational record.)

area code

daytime number/evening number

Name: \_\_\_\_\_

Organization/Station: \_\_\_\_\_

Title: \_\_\_\_\_

Business Address: \_\_\_\_\_

street

city

state

zip

How many years have you attended Broadcasters' Clinic? (Include those years when it was called "FM Clinic"): \_\_\_\_\_

Payment Enclosed: ☐ BROADCASTERS' CLINIC —\$100

☐ BROADCAST ENGINEERING MANAGEMENT — \$50

☐ BROADCASTERS' CLINIC and BROADCAST ENGINEERING MANAGEMENT — \$135

☐ *Optional Dinner, BROADCASTERS' CLINIC, September 25, 1984 — \$12*

**To register,** phone or mail this form along with your check made payable to UW-Extension to: Registration Office, The Wisconsin Center, 702 Langdon Street, Madison, WI 53703. Phone: (608) 262-7942.

UW-Extension provides equal opportunities in employment and programming including Title IX requirements.