

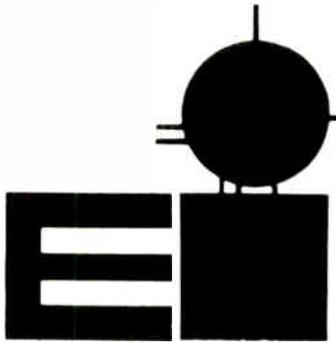
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# COMMON POINT®

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A MONTHLY NEWSLETTER FOR BROADCASTERS

Distributed by Electronic Industries, Inc., 19 E. Irving Ave., Oshkosh, WI. 54901

414-235-8930

## ENGINEER HOT LINE SPARKS INTEREST!

The March *Common Point* 'Editor's Notebook' question on the idea of an '800 Number HOT LINE' for engineers in trouble, brought a fast response with many engineers endorsing the idea and asking if they could be included. They wanted to know how it would work? Would they get paid for it? etc. Even the NRBA Monday Memo mentioned it. Some engineers said they already had a "Hot Line" going for a few stations.

The *Common Point* idea would, for example, find an engineer in Southwest Missouri perhaps a little light on experience and find himself in trouble with an old Collins 20V3. Things had gone okay during the ballgame that night, but just before Sign Off, something happened. Plate voltage dropped to about 150/200 volts and plate current was under 100 MA. The transmitter didn't shut down...it just sat there. The Night Operator had called him at home, he drove to the station thinking there must be a bad rectifier or something. Three hours later, it's 2:00 a.m., the transmitter is still in trouble and he is alone. Very much alone.

He reaches for the phone and calls the 800 trouble number. The Telephone Answering Service asks his name, call letters, insurance card number, and type of transmitter. She checks her list and finds there's an engineer on standby in Minnesota with a back-up in New Mexico, and a second in California. These are experienced engineers and, what's more important, the Telephone Answering Service check list shows they are experienced with the Collins 20V3.

(cont. on page 2)

### Feature Line for June —

**phelps  
dodge**  
*Communications Company*



The Marlboro, New Jersey, unit of Phelps Dodge Communications Company is a manufacturing and research, development and engineering organization uniquely qualified by its facilities, technical staff and broad experience. Starting in 1933 as Communication Products Co. in the manufacture of antennas, coaxial cable, and other required hardware, the company was acquired by Phelps Dodge in 1962 and is currently under the direction of Edward F. Boehm, senior vice president.

Phelps Dodge Communications Company is a name known world wide in communication products currently with two plants in New Jersey, one in Arizona and a new facility in Denmark.

\*\*\*\*\*

## HOT LINE

(cont. from page 1)

### EMERGENCY CALL BACK

Minnesota doesn't answer, but the Telephone Answering does make connections in New Mexico. She passes along the information that she was given. The engineer in New Mexico goes into the Study, closes the door so no one else is disturbed, pulls down his manual on the 20V3 and then, using his engineering credit card, calls Missouri. It's been ten minutes since he got the call but a very long ten minutes to our engineer in Missouri.

The Emergency Engineer confirms the Missouri engineer's name, call letters and Insurance Card Number. Everything checks, so they go to work. First of all, there is no hurry. The station engineer is tired and frustrated. That friendly voice from New Mexico has to slow him down...don't make mistakes.

First, open the upper doors, unplug the fan and pull that lower panel off. Okay so far. Now kill the breaker. Is the power transformer hot? Yes, but I can keep my hand on it. Okay. Now take a flashlight and look around the transformer. Any burn marks? Any signs of excessive heat? Everything okay so far. Now, look at the secondary of the power transformer. See the voltage markings on the different taps? Okay, now short out the interlocks and turn the Wall Breaker on. Check those taps for readings.

The search continues step by step, that sure experienced voice calming the storm of frustration that every engineer has felt. Suddenly the voice from New Mexico says, "I tell you what — kill the main breaker again. Now, up on the left hand side near the top — see those big resistors? They're held in place by those end clips. First take a big screwdriver to take off any unfriendly reminders that might be riding on any capacitors, then I want you to take those resistors out. Be careful — don't drop them." The first one seems okay, but then, the clips are loosened on the second, and the resistor comes out in two pieces. The problem has been located.

The station engineer confirms that his old Gates 250GY Auxiliary is in good health. The Emergency Engineer makes sure he has the number to order a replacement resistor and signs off.

### WRAP UP . . .

The next day he fills out the insurance claim. Emergency call time 2:15 a.m. — Sign Off 3:30 a.m. at \$25.00 per hour = \$50.00. The claim goes to the insurance company. The station confirms the call and time, and the Emergency Engineer receives his check.

\*\*\*\*\*

(EDITOR'S NOTE: This type of service could be part of your membership — as an engineer in the SBE — or as a station in the NRBA or NAB. We have asked them if they think this type of program is feasible.)

## Editor's Notebook

Gathering information together for this issue of Editor's Notebook, we had reports the economy has slowed things down at many stations, with new equipment plans having to be shelved, especially in smaller markets. There are high hopes things will pick up by fall, but, in the meantime, remember if you need parts or complete repair work done, E.I. has one of the better repair centers in the midwest, with all the test equipment to be sure things are brought back to original specs. Give Jim, our service manager, a call. He can give you prices and turn around time.

**NAB Convention...** Attendance was reported down quite a bit this year, especially from stations in the Eastern states, with the main reason given as the high cost of air fares. Moving the convention back toward the Midwest, we are told, leaves only Chicago with enough hotel space, but the union problem has closed the door there. We were told the same problem showed up this year in Las Vegas. Dallas next??

**June Common Point Winner...** is KBOI Radio, located in Boise, Idaho. They get \$100.00 to spend as they see fit here at E.I., there are no strings attached, just return your acknowledgement card by month end.

**Other Problems...** for the NAB Convention, and one that is providing an increasing headache, is display space. We are told manufacturers cannot increase their display space, and some of the new ones may be cut out completely next year at Dallas. Is the time coming to set up radio and television convention times on different dates?

**NRBA Convention...** scheduled for September in Miami Beach has had to move up the street from The Diplomat in Hollywood, Florida where it was originally scheduled. New location...the Fontainebleau in Miami Beach. We think the timing is still all wrong. First...September is a busy time at home for radio people, and second...July, August and September are not the best months for Florida. Later in the fall will find most broadcasters still very busy at home plus the call of the wild and hunting season. How about January, February or March??

**The Big Question for June...** should the possibility of an Engineer's Hotline be favorably received

1. Would you as an owner or engineer support this program?

2. Should the program be under the administration of an organization such as (a) the SBE, (b) the NAB, or (c) the NRBA??

3. Would you favor an "insurance type" payment arrangement or should stations pay as they go?

**LET'S HEAR FROM YOU!!**



YE OLDE EDITOR

Just in Case You Missed it  
at the NAB —



## MODEL 6509 AUDIO CONSOLE



- FIVE CHANNELS - ROTARY OR LINEAR CONTROLS
- NINE INPUTS
- STEREO
- SELECTABLE MUTING-SWITCH SELECTED
- RELAYS FOR "ON THE AIR" LIGHTS
- PUSH BUTTON INPUT SELECTOR SWITCHES - COLOR CODED
- CHOICE OF INPUT PREAMP TYPES
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- VOLTAGE CONTROLLED ATTENUATORS
- BARRIER STRIP INPUT & OUTPUT
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- MONITOR OUTPUT AT LINE LEVEL
- SEALED MAIN POTS

FOR MAIN CONTROL ROOM OR PRODUCTION ROOM —

Just **\$1595.00**

C.P.S.  
SAVE \$32.00



THE 6509 AUDIO CONSOLE  
BY  
**MICRO-TRAK  
CORPORATION**

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## THE GUY SNAPPING PHENOMENON

THE CAUSES AND CURES by *Lightning  
Elimination  
Associates, Inc.*

### INTRODUCTION

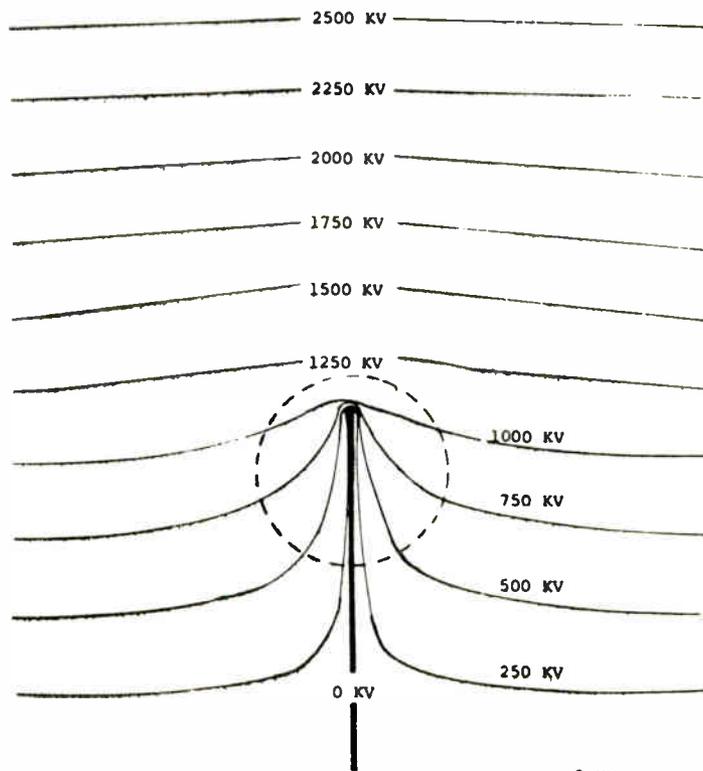
Within the broadcast industry there is a phenomenon known as "guy snapping". This phenomenon is manifested in two ways.

The primary manifestation is both audible and visual; there is a pronounced arcing across the guy insulators. It may start from the top and jump each insulator in succession from top to bottom, or it may start from the lower insulators and move to the top.

The secondary effect is the impact on the antenna's impedance. Electrically it will appear as a short across each insulator, making the guy act temporarily like a solid wire. This, in turn, will cause it to temporarily act as a re-radiator and induce a reflected wave into the antenna system. This, of course, changes the VSWR as it appears at the transmitter causing it to cycle off and on if it has a magnaphase type protector, or causing trouble if it is unprotected. Some stations report that their transmitter sounds like machine-gun under these conditions.

This phenomenon seems to be isolated to certain geographic areas, and is most predominate under special situations. Specifically, guy snapping predominates in dry areas, prior to or during electrical storms, but

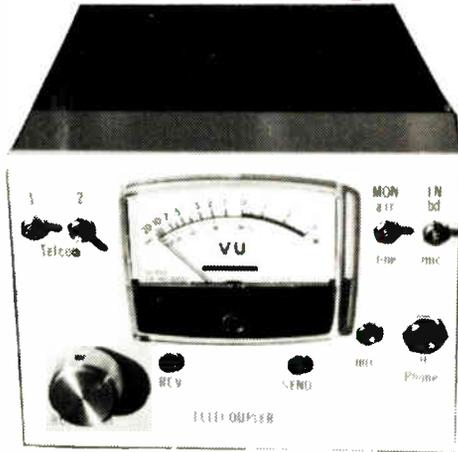
Figure 1, Effect of a 550 KHz Half-Wave Antenna on the Electrostatic Field (Neglecting Guy Wires)



0 KV  
(cont. on page 5)

**It's New!**  
**It's Different!**

**It's Telecoupler**



The Telecoupler is designed for a broadcast station desiring to interface the telephone to an audio console during two-way conversation such as telephone interviews, telephone talk shows or "on-the-spot" news coverage.

- \* Hands Off after initial setup.
- \* High quality transmission of telephone material possible.
- \* Telephone audio equalized.
- \* No additional inputs are required on console.
- \* No possibility of audio feedback and coloration due to hybrid circuits.
- \* Two-way "on-the-scene" communication to a remote transceiver is possible with accessory.
- \* Telecoupler is easily connected.
- \* The need for a second telephone for communication is eliminated on TV remotes.
- \* Removes Necessity for headsets on TV Call-in talk shows.
- \* RF proofed for greater reliability.
- \* Status Lites to indicate condition of Phone line.
- \* Makes possible "Shouting Match" conversation on the air.
- \* Reasonably priced. **\$895<sup>00</sup>**

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## **SUPERSCOPE C-207LP**

**— RIGHT ARM FOR THE NEWS DEPARTMENT**

The Superscope C-207LP three-head portable recorder is your personal information-processing tool. Combine its compact size and sophistication in features with its two-speed capability and you have the ideal recorder for broadcast journalists and others who demand outstanding sound reproduction and dependable performance of true broadcast quality.

The C-207LP's two-speed function lets you record at 17 1/2 ips, or for twice the recording time on your cassettes use 15/16 ips mode, cutting cassette expenditures in half.

The C-207LP has separate record and playback heads so you always hear exactly what's going on the tape as you record there's no guesswork, and you can instantly check recording progress any time. Three-head design also means each head is designed specifically for its function—record, playback/monitoring or erase—without sacrificing any performance for sake of compromise.

That's just for starters—check out all the other features that make the C-207LP the choice of so many people who demand professional quality and performance.

- Super-hard permalloy record and playback heads ensure a wide frequency response, low phase distortion and up to ten times longer life than ordinary heads.
- Memory Rewind/Replay works in conjunction with the 3-digit tape counter to replay any selection on the tape—automatically. Just reset the counter to "000" at any point on the tape. Later, simply hit rewind. The tape will rewind to "000" and immediately start.
- One-touch record allows instant recording with one-button ease, and lets you go directly from play into record mode.
- Cue and review helps you find any point of sound on a cassette by enabling you to hear the tape while it's being advanced in fast-forward or in rewind.
- Automatic manual-limiter record level switch provides the option of setting record levels manually, or using the built-in automatic record level (ARL) circuitry. The limiter automatically protects against high input signals, so sudden volume increases won't cause distortion or tape saturation.



Reg. \$250.00

STILL

**SUPERSCOPE**  
BY HANSON

Portables that go beyond

**\$184<sup>95</sup>**

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19 E. Irving - Oshkosh, WI 54901

**GUY SNAPPING**  
(cont. from page 3)

**THE CAUSE**

A thorough analysis of case histories and a correlation of the phenomenon with local conditions reveals two potentially unrelated physical situations that exist while the phenomenon is observed. These include:

(1) Dry air, high wind velocities, with or without dust or snow; or

(2) Prior to a thunderstorm arrival over the site, during the buildup stage and/or under fast moving dark clouds.

These situations cause the guy snapping phenomenon in entirely different and unrelated ways. Both involve the charging of the isolated guys to the point where the difference in potential across any given breakup insulator exceeds the flashover point. Once one flashover occurs the phenomenon tends to cascade as in the domino effect, usually working from top to bottom, but sometimes in reverse.

The wind related charging phenomenon comes about through rapid particle motion actually removing electrons from the guy segment. Since it is suspended in dry air the resulting charge remains and continues to build up until the air at the insulator with the largest difference of potential across it breaks down, or until the rain forms a leakage path.

The electric storm related charging phenomenon results from the strong electrostatic field, and its variations, that accompanies the approaching storm and the build up within the area of concern, but prior to the rain.

These fields have been measured (1, 2, 3) by many and found to achieve levels of between 10 KV and 30 KV per meter of evaluation above earth. These fields from around a tower in a manner that causes the lines of equipotential to be distorted as illustrated by Figure 1. Note that the field concentrates at the top of the tower and in the vicinity of the guy wires.

The guy wires of a broadcast station are broken up into a series of electrically isolated conductor segments by the insulators. These isolated segments are suspended in a non-conducting medium — air. The drier the air, the less conductive it is. Since the electrostatic field in an approaching storm varies significantly, but achieves values in excess of 10,000 volts per meter elevation above the earth's surface, these isolated guy segments are immersed in constantly varying fields, peaking at related values. Typical peak values can be estimated from Figure 2.

If we assume the field peaks momentarily at 5,000 volts per meter and our example antenna has four isolated guy segments, we can calculate the electrostatic pressures involved. From Figure 2 we see that the upper guy insulator will have 500 KV across it. The next one down has 50 KV across it, but the difference in potential increases toward ground level so that there is 200 KV across the lower insulator. To this must be added the potential created by the transmitter loading up the tower.

The data was based on the antenna system for Radio Belgrade, now working at 2 megawatts, but scaled down for a 50 KV transmitter. Note that this consideration is of lesser significance, but does add another 3 Kv-plus to the potential across the insulators.

(cont. on page 11)

# GUY CHARGE DISSIPATION CHOKE

PROTECTION AGAINST STATIC CHARGES  
CAUSED BY

- DRY WIND                      · BLOWING SNOW
- BLOWING DUST              · ELECTRICAL STORMS

Prevents resulting insulator arc-over  
Protects transmitter against varying and high VSWR  
Protects insulators against tracking and failure

Model CDC - 1

 <p style="font-size: 2em; color: red; font-weight: bold;">\$99<sup>50</sup></p>	<p style="font-weight: bold;">HIGH IMPEDANCE TO OPERATIONAL FREQUENCY</p>
<p style="font-weight: bold;">VERY LOW IMPEDANCE TO CHARGING MECHANISM</p>	 <p style="font-size: 2em; color: red; font-weight: bold;">\$99<sup>50</sup></p>

IN PLACE OF OR ACROSS . . .

- UPPER GUY INSULATORS ONLY
- UPPER AND LOWER INSULATORS
- IN EXTREME CASES - ALL INSULATORS

Resistors appear as high z to lightning and broadcast frequencies — guy chokes appear as solid conductor to drain static voltage but as open circuit to broadcast frequencies.

Manufactured by



LIGHTNING ELIMINATION  
ASSOCIATES

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# An Invitation to Join.

## R.S.V.P.

With this issue of **Common Point** we hope to start a series of columns on the Society of Broadcast Engineers. We hope that many of our readers will join us, relating your experiences with the SBE, the reasons you are a member, the reasons you have given it up, the reasons you didn't even bother. We also hope to define the goals of the SBE which is a point where we will start off on.

The SBE is supposed to benefit ALL members involved and on the national level, I don't think this would be questioned. However, a monopolization by the TV engineers on the local level seems to be occurring more and more.

One engineer said... "Hell, when I attended, the guys in radio just grabbed a beer and sat in back to play a little crib. The guys in TV took over, talked TV and only TV." This seems to be more than just one isolated case according to other radio engineers' responses from the past few months.

The big questions here are...should the blame be placed on TV engineers for taking over? Or is it the radio engineers' fault for not insisting they be included in the programs? Or is it a case of blaming anyone?

The National Association of Broadcasters finally began to realize their mistake with radio when the NRBA was organized. Does this have to happen to the SBE before the problem is recognized? Or should there be a separation between radio and TV broadcasters?

Another subject that kept coming up in conversations with engineers was the certification program. One engineer I talked to said... "I was an engineer before most of those guys were even born...after 40 years do you think I should bother to be certified by them?"

These are just a few of the many questions being asked and if the SBE is to become what many think it should become, these questions must be answered...by YOU, the Broadcast Engineer.

\*\*\*\*\*



## GET READY FOR SPORTS NOW!

## THE GREAT FALL MONEYMAKER . . .



**T411  
TEL-E-MOTE**

**\$650<sup>00</sup>**

Here's the sportscaster's dream machine! The T411 is a small, light and portable remote mixer that originates your broadcast from dial phone line or wire.

Great Features:

- Built-in rotary dial
- Three mike channels #3 switches to spot operation

- Channels 2 & 3 switch to phono equalization
- Switchable line equalization improves audio response from phone or wires
- Built-in 9 volt battery pack backs up 115 Volt power source
- Headset amp drives up to 4 headsets
- Built-in test oscillator
- Carrying handle & feet



**T112 TELEPHONE TO STUDIO  
EQUALIZER/COUPLER**

**\$325<sup>00</sup>**

The Russco T112 will greatly improve the voice quality of your talk show and the on-air sound of remotes. Designed as an interface amplifier equalizer, it works between the standard dial telephone line and your studio console. The T112 is the perfect companion unit to the Russco T411 TEL-E-MOTE mixer. Features:

- 2 separately adjustable 600 ohm balanced outputs feed the console and

- a recording line simultaneously
- Separate 2 Watt headphone amp with jack provides local monitoring without loading the line
- You can correct line frequency response by switching in a 3 band equalizer
- 60 Hz notch filter reduces hum in the phone line
- Cabinet with rack mount optional

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# **RUSSCO**

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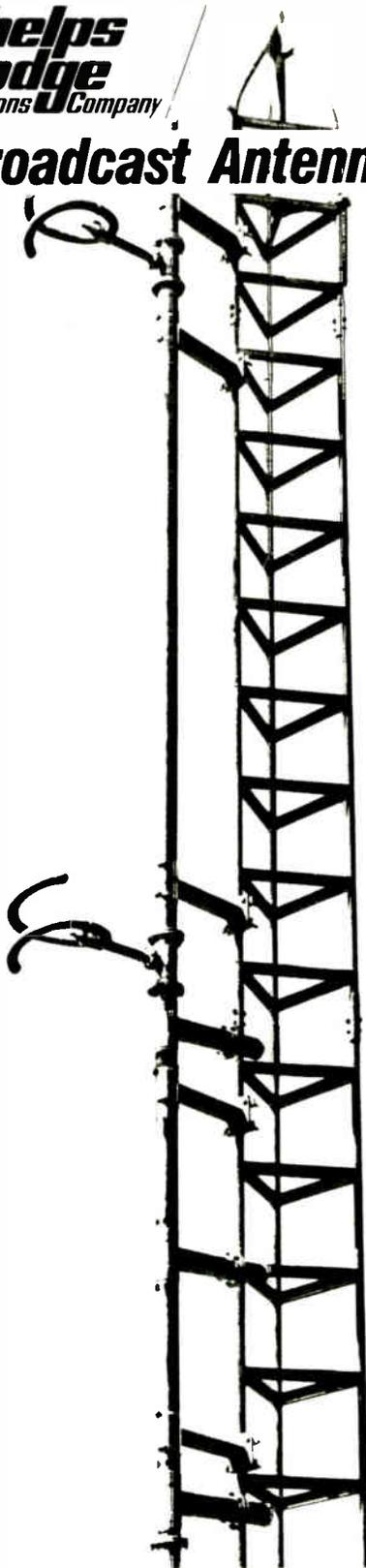
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## FM Broadcast Antennas



Typical tower installation of circularly polarized antennas.

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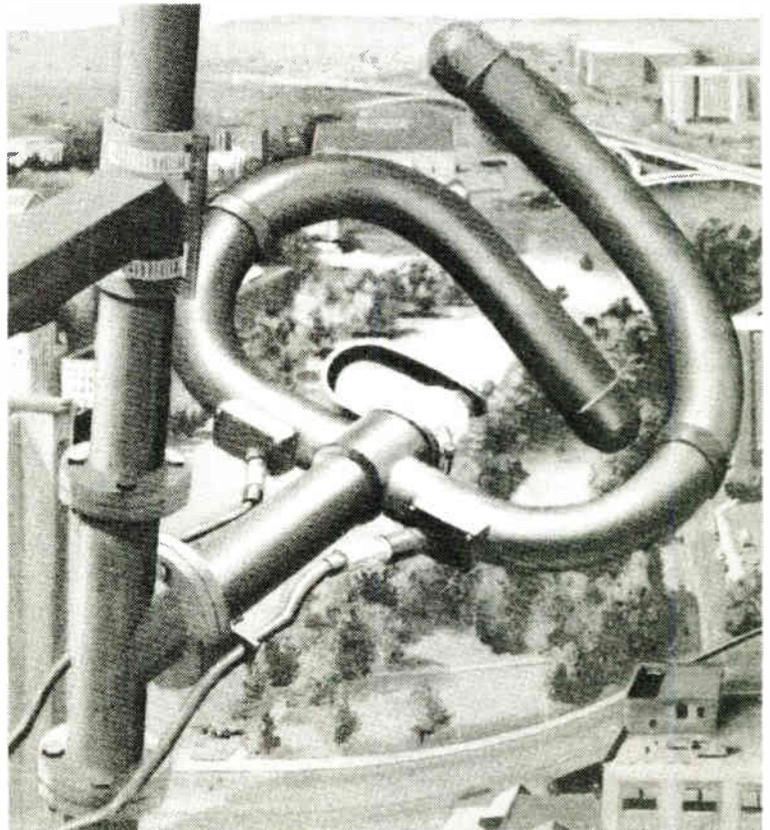
Here is a series of circularly polarized and horizontally polarized commercial and educational antennas for the FM broadcast industry. These antennas are less susceptible to corona. The unique circularly polarized antenna assures phase coincidence of the vertical and horizontal components.

Circularly and horizontally polarized antennas are available with any combination of null fill and beam tilt. The High Power and Low Power antennas utilize identical radiating elements. The Low Power series employs 1 $\frac{1}{8}$  inch feedline. The High Power units use 3 $\frac{1}{8}$  inch feedline. Both series of antennas are available in systems which incorporate 1 to 16 elements. Normally, systems with 8 or less elements are fed at the bottom; above 8, the system is fed from the center.

Each of the radiators is constructed of 1 $\frac{1}{8}$  inch diameter thickwalled copper tubing with spherical ends which eliminate corona problems and permit 20 KW testing of basic elements. The stainless steel deicers are easily removable and designed for trouble free service. Each antenna array contains a matching transformer approximately 6 feet long which is simple to adjust without losing pressure.

The new antennas are basically 1 $\frac{1}{2}$  turn helices mounted on one wavelength centers. The radiation centers of both the vertical and horizontal components are identical, resulting in the phase coincidence essential for true circular polarization. Each of the elements in the antenna system will represent an impedance of 50 ohms times the number of elements. As an example, an 8 bay antenna would have 400 ohm elements. The free space circularity patterns of the new antennas are within  $\pm 1$  db of perfect circularity. When side-mounted on a wide tower, the new series, like all antennas which radiate a vertical component, produces a pattern of the vertical component with nulls and some directivity. In practice, however, the new series will provide the urban area with considerably better coverage than a horizontal-only radiating system.

Educational FM antennas differ from the commercial FM antennas in that they are fabricated of  $\frac{7}{8}$  inch stainless steel tube and, due to lower power requirements, are fed with flexible solid dielectric cables.





## Super Power Circularly Polarized FM Broadcast Antennas

The new series of Super Power Circularly Polarized FM Broadcast Antennas are very high power antennas which use a minimum number of bays. A massive 3 1/8 inch (79.4mm) two tube balun provides wider match bandwidth than loop coupled designs. The new element has a much lower Q than previous designs. These new antennas have a VSWR of 1.1:1 for approximately 500 KHz, 2 1/2 times the bandwidth of standard circularly polarized low power and high power antennas. Two bay and four bay arrays are also available. All elements are fed inphase to produce maximum gain on the horizon with the two element array end fed and the four element array center fed.

All antennas are precisely cut and matched at the factory. A fine tuner is supplied for final matching of the antenna after installation. The input impedance of each element is carefully adjusted for optimum results in the final array configuration.

If required, stainless steel internal deicer heaters are available. Due to the much wider bandwidth produced by the new Super Power Circularly Polarized Antennas the impedance change due to icing is minimized, therefore deicers are not required under light icing conditions.

Length of antenna in feet is 984 divided by frequency in MHz times (number of bays less 1) plus 9.

Power gains are for 50/50 horizontally and vertically polarized ratios.

Antenna polarization is circular in all directions of azimuth.

Prices include complete mounting hardware for leg or face mounting on uniform towers 24" (609.6 mm) face or less. Brackets for other than uniform towers are extra and will be quoted upon request.

Antenna weights include standard mounting hardware. Add 15 lbs. (6.8 kg) per bay for deicers. Deicers require 230 volts single phase balanced to ground with 1000 watts consumption per bay.

When ordering, specify:

Antenna Type No.

Frequency (88.1 to 107.9 MHz)

Description of tower, make and model

Beam tilt and null fill, if required



Type No. And Bays	Power Gain	Gain In dB	Field Gain	FS @ 1 mile (1.6 km) 1 kw, mv/m	Net Wt. Lbs. (Kg)	Power Rating kw	Wind Load Lbs. (Kg)
SPC-1	.475	-3.21	.69	95	150 (68)	20	100 (45.5)
SPC-2	1.00	0.0	1.00	138	400 (181)	40	570 (259)
SPC-4	2.15	3.3	1.47	203	700 (317)	40	900 (409)

\*at 50.33 PSF (244 166 kg-m<sup>2</sup>)

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# ELECTRONIC INDUSTRIES INCORPORATED

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19 E. IRVING — OSHKOSH, WI 54901

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Standard circularly polarized FM antennas are fabricated of 1½ O.D. copper tube formed into a 1½ turn helical radiating element. This element produces a transmitted signal that is circularly polarized in all directions in the azimuth plane.

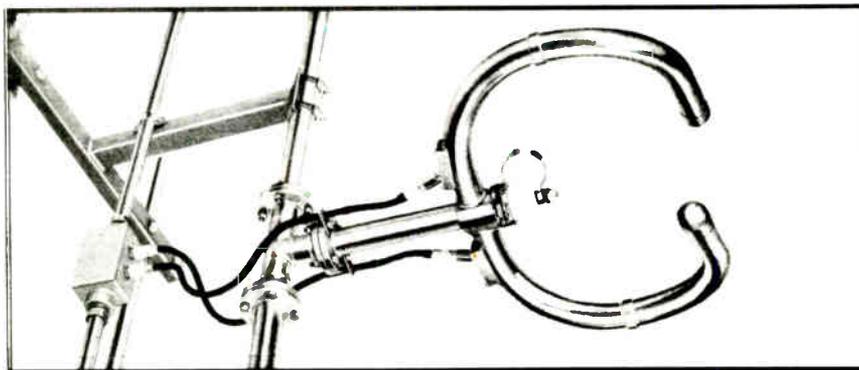
Antennas are available with all elements fed inphase to produce maximum gain on the horizon with 1 through 8 elements end fed and 10 through 16 elements center fed. If beam tilt and/or null fill is required the multi-element array is center fed to produce the required pattern is center fed with appropriate power divider and phaser supplied.

All antennas are supplied complete ready for installation on the tower. Each antenna has an input transformer to correct for any minor variations between the antenna test site and the actual field installation.

If required, stainless steel internal deicer heaters are available.



## Circularly Polarized FM Broadcast Antennas



### FM ANTENNA SPECIFICATIONS

Type No. And Bays	Power Gain	Gain In db	Field Gain	FS (α 1 Mile 1 KW, MV/M)	Net Weight Lbs. (Kgs.)	Power Rating KW	Wind Load* 50/33 PSF
<b>CFM LP-1</b>	.45	-3.24	.67	93	118 (53.6)	5	97
<b>CFM HP-1</b>	.475	-3.21	.69	95	178 (80.7)	5	180
<b>CFM LP-2</b>	.95	-0.2	.98	136	145 (65.8)	10	170
<b>CFM HP-2</b>	1.00	0.0	1.0	138	223 (101.2)	10	280
<b>CFM LP-3</b>	1.5	1.8	1.23	170	172 (78.2)	10	250
<b>CFM HP-3</b>	1.55	1.9	1.25	172	268 (121.8)	15	400
<b>CFM LP-4</b>	2.05	3.1	1.44	199	198 (89.8)	10	325
<b>CFM HP-4</b>	2.15	3.3	1.47	203	313 (142.0)	20	525
<b>CFM LP-5</b>	2.55	4.1	1.6	221	225 (102.0)	10	400
<b>CFM HP-5</b>	2.70	4.3	1.65	227	358 (162.4)	25	650
<b>CFM LP-6</b>	3.15	5.0	1.78	246	251 (114.0)	10	480
<b>CFM HP-6</b>	3.30	5.2	1.82	251	404 (183.6)	30	780
<b>CFM LP-7</b>	3.65	5.6	1.92	265	278 (126.0)	10	580
<b>CFM HP-7</b>	3.85	5.9	1.97	273	449 (203.7)	35	910
<b>CFM LP-8</b>	4.2	6.2	2.05	283	305 (138.4)	10	640
<b>CFM HP-8</b>	4.4	6.4	2.10	290	494 (224.1)	40	1030
<b>CFM LP-10</b>	5.2	7.2	2.28	315	365 (165.8)	10	820
<b>CFM HP-10</b>	5.5	7.4	2.35	325	600 (272.2)	40	1320
<b>CFM LP-12</b>	6.25	8.0	2.5	345	418 (189.6)	10	975
<b>CFM HP-12</b>	6.6	8.2	2.57	355	690 (313.0)	40	1560
<b>CFM LP-14</b>	7.3	8.6	2.7	373	471 (214.0)	10	1130
<b>CFM HP-14</b>	7.7	8.9	2.8	386	781 (354.3)	40	1800
<b>CFM LP-16</b>	8.4	9.2	2.9	400	532 (241.3)	10	1290
<b>CFM HP-16</b>	8.8	9.5	2.97	410	872 (395.5)	40	2060

CFM LP - Circularly Polarized Low Power Shunt Fed with 1½" Feed Line complete with 1½" Fine Matcher

CFM HP - Circularly Polarized High Power Shunt Fed with 3½" Feed Line Complete with 3½" Fine Matcher

\*244/166 Kg-m<sup>2</sup>

Length of Antenna in feet is 984 divided by frequency in MHz X (No. of Bays - 1) Plus 6½.

Power Gains are for 50/50 horizontally and vertically polarized ratios. Other ratios available.

Antenna polarization is circular in all directions of azimuth.

Prices include complete mounting hardware for leg or face mounting on uniform towers 24" face or less. Brackets for other than uniform towers are extra and will be quoted upon request.

High Power antennas—input flange is 3½" EIA Female. Low power antennas—input flange is 1½" EIA Female.

Antenna weights include standard mounting hardware. Add 10 lbs. per bay for deicers. Deicers require 230 volts single phase balanced to ground with 500 watts consumption per bay.

When ordering—specify:

Antenna Type No.  
Deicers, **PD-1201**  
Frequency (88.1 to 107.9 MHz)  
Radome **PD-1200**

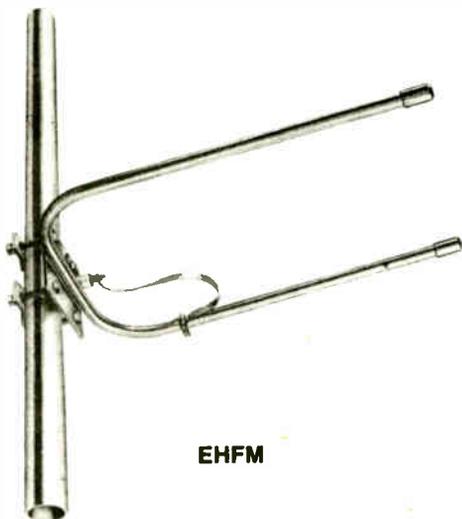
Horizontal and Vertical Power Gains  
Description of Tower—Make & Model  
Beam Tilt and Null Fill, if required  
Thermostat & Control Box **PD-1202**



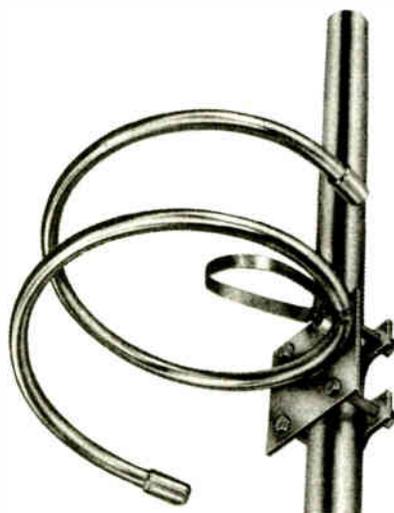
## FM Educational Antennas

Educational FM antennas using the same general design concepts as the commercial High Power and Low Power antennas are available.

However, these antennas, because of the normally lower power required in the educational service, are fabricated of 7/8" stainless steel tube. The circularly polarized antenna is a 1½ turn helix and the horizontal polarized element has a U configuration. The educational antennas are complete with a matching harness of RG type cables and are designed to mount on tower legs or support pipes 1¼" to 2¾" diameters. The multi-element arrays have an element spacing of 10 feet.



ECFM



EHFM

### CIRCULARLY POLARIZED FM EDUCATIONAL ANTENNA SPECIFICATIONS

Type No. And Bays	Power Gain	Gain In db	Field Gain	FS @ 1 Mile 1 KW, MV/M	Net Weight Lbs. (Kg.)	Power Rating KW	Wind Load* 50/33 PSF
ECFM-1	.43	-3.66	.65	90	9 (4.1)	.2	19
ECFM-2	.90	-4.46	.95	131	21 (9.6)	.4	40
ECFM-3	1.42	1.52	1.19	165	32 (14.5)	.5	62
ECFM-4	1.95	2.9	1.39	192	43 (19.5)	.5	84
ECFM-5	2.42	3.84	1.56	215	54 (24.5)	.5	107
ECFM-6	2.99	4.76	1.73	239	65 (29.5)	.5	130

\*244/166 Kg-m<sup>2</sup>

When ordering specify Radome PD-1203

### HORIZONTALLY POLARIZED FM EDUCATIONAL ANTENNA SPECIFICATIONS

Type No. And Bays	Power Gain	Gain In db	Field Gain	FS @ 1 Mile 1 KW, MV/M	Net Weight Lbs. (Kgs)	Power Rating KW	Wind Load* 50/33 PSF
EHFM-1	1.0	0	1.0	138	9 (4.1)	.2	19
EHFM-2	1.8	2.55	1.34	184	21 (9.6)	.4	40
EHFM-3	2.8	4.47	1.67	230	32 (14.5)	.5	62
EHFM-4	3.7	5.7	1.92	264	43 (19.5)	5	84
EHFM-5	4.6	6.6	2.1	289	54 (24.5)	.5	107
EHFM-6	5.5	7.4	2.3	317	65 (29.5)	5	130

\*244/166 Kg-m<sup>2</sup>

Educational FM Antennas are designed to mount on tower legs or support pipes having diameters up to 2¾". The spacing between bays is 10 ft.

Educational FM Antennas are fed with RG-8 and RG-11 cables and all have a type N Male Input Connector.

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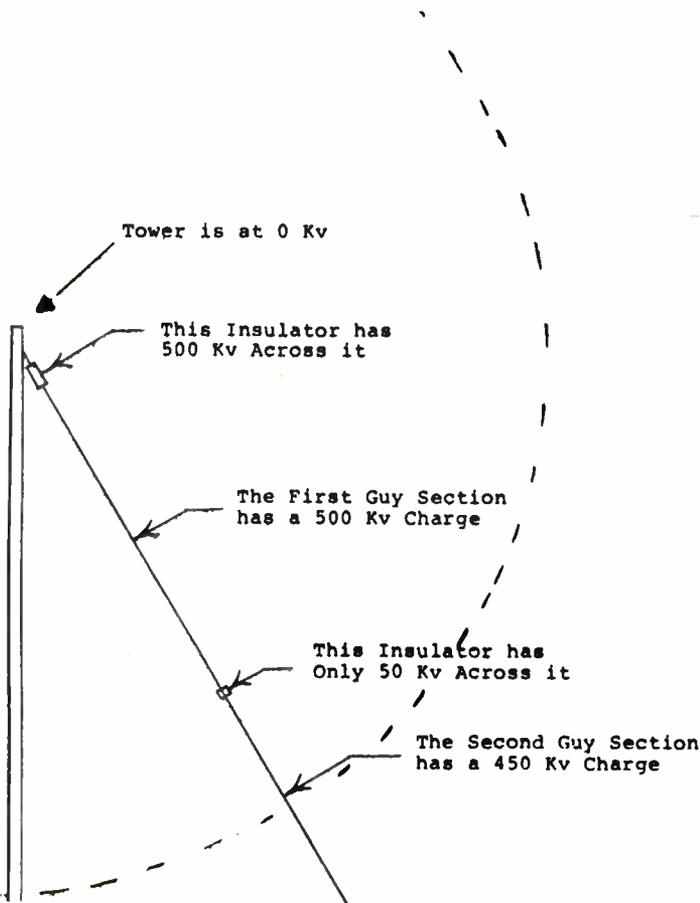
**GUY SNAPPING**  
(cont. from page 5)

before the rain starts. Blowing dust or dry snow will produce spectacular displays. In each case it seems that the phenomenon disappears as soon as the rain starts in the transmitter area.

Figure 2, Typical Stress on Insulators Before or During a Thunderstorm (550 KHz Half-Wave Antenna)

Voltage Between Other Guy Sections

Second and Third	- 100 Kv
Third and Fourth	- 150 Kv
Fourth and Ground	- 200 Kv



Using less optimistic but representative data it can be shown that the potentials across the upper insulators can achieve levels in excess of one million volts. Further, the continually changing field compounds the impact. With a nearby stroke the surrounding field is suddenly reduced significantly, leaving a significant bound charge on the guy segment without the "sympathetic" charging field. It is at this point that the air breaks down, an arc is formed and insulator "flash-over" occurs. Once started, the rapid cascading effect makes the guy momentarily act like a solid wire on the antenna systems.

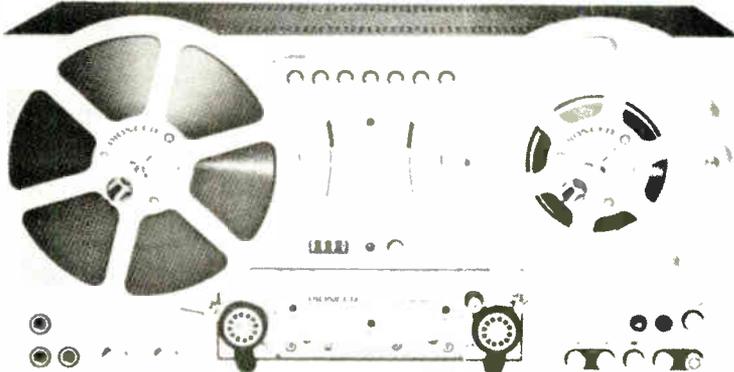
. . . to be continued.

(Next month...conventional protective options - providing positive protection & the charge eliminator concept.)

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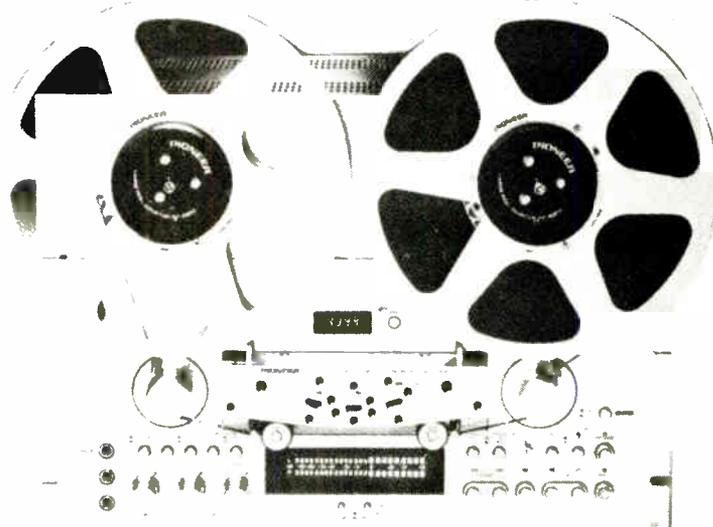
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# TALKBACK

Our "Talkback" column is in trouble...and the big trouble is lack of space with over 90% of the cards coming back with at least a short comment. One card came back stapled to a letter. This is good, but bear with us if we don't get yours in right away.

**BEATING TALL PROBLEMS** article by Jim Lies was very well received. Several replies went on to ask for articles by Jim on specific problems, especially telephone lines and S.T.L.'s.

Re **FIRST PHONE...FROM ILL...**having SBE take over by no means perfect, but better than FCC exams...**TEXAS...**bring back experience requirement for First...have had my First for 35 years...don't want to give up. **FROM NEW HAMPSHIRE...**heavily in favor of First Phone...test might be made tougher. **ALABAMA...**will doing away with First affect us who can do work but don't have First? What about test given in the station where you are employed? **FINALLY FROM IOWA...**at Carl Smith's DA seminar last October, NAB engineer said Ferris told his staff "I want to get rid of first class, now the reasons so we can".

Re **9 KHZ SPACING...INDIANA...**consulting engineers will profit most...nighttime AM a mess now...I question if any gains? **FROM IDAHO...**comments by Mr. Livesay interesting but puzzling...article seems negative but ends up with endorsement of 9 KHz. **FROM MAINE...**do not agree with Ray Livesay about 9 KHz. If more local stations needed...go to FM. **TEXAS...**enjoy Ray Livesay's article...think he is doing a good job at DBA...needs all daytimers support. **KENTUCKY...**no to 9 KHz. Keep up the good work. **INDIANA...**9 KHz an increase in interference of 5%? Interference already ridiculous mess. **ARIZONA...**has Mr. Livesay considered the time, money and engineering involved...**ARKANSAS**...Ray Livesay not withstanding, 9 KHz is liability. Better solution is to add 100 KHz to top of AM band.

Re **ENGINEERING HOTLINE...EXTRA BIG RESPONSE INCLUDING SOUTH DAKOTA . . . WISCONSIN . . . MISSISSIPPI . . . IOWA . . . ALABAMA . . . OREGON . . . ARIZONA . . . ILLINOIS . . . WASHINGTON . . . LOUISIANA . . . MINNESOTA . . . MISSOURI . . . KENTUCKY . . .** **Common Point** passed info along to NRBA and NAB and SBE for official reaction.

Repeat from editor's column this issue . . . Should the possibility of an engineer's hotline be favorably received...

1. Would you as an owner or engineer support this program?
2. Should the hotline program be under the administration of (a) the SBE, (b) NAB, or (c) NRBA?
3. Would you favor an "insurance type" payment arrangement or should stations pay as they go?

**YOUR OPINION IS IMPORTANT . . .  
LET'S HEAR FROM YOU!!**

\*\*\*\*\*

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6. All logic is contained in the Programmer 3 head.

**IF YOU ARE PLANNING TO GO LIVE ASSIST OR  
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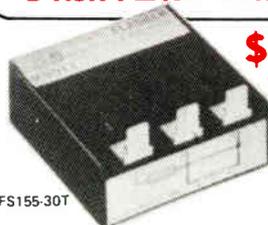
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WANTED: Northern Wisconsin & U.P. Michigan . . . broadcast engineers for new S.B.E. Chapter. Contact Steve Brown, WHBY Radio, Appleton, WI.

WANTED: Information — manuals — parts for REL 518B-DL 1 kw FM transmitter. Contact Dick Van Zandt, Jr., at WEMI Radio, 360 Chute St., Menasha, WI. 54952.

WANTED: Schafer 800 parts or systems. Will consider exchange or purchase. Have in stock parts for Schafer 800 (tube type) and 800T (transistor) automation systems. Contact Cliff Groth, mgr., Broadcast Electronic Service, 414-563-7236.

## DURACELL BATTERIES

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8450-U500 . . . . .	\$40.42
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FOR SALE: Harris MSP-100 stereo audio processor & Harris MS-15R stereo generator, 2 yrs. old, new cost over \$10,000, asking \$3500. Chuck Tiftt, KYYY Radio, Bismark, ND, 701-223-0900.

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# COMMON POINT CLASSIFIEDS

## WORKBENCH

### SPECIALS

by  
Jim Grignon

Quick fix of the month is from Bill McManus of KMER on the RT-909. The brakes will not engage due to the failure of Q219 (brake solenoid control transistor). Bill found C212 a 1000 MF 25v capacitor defective which continually causes a Q219 failure.

Thanks, Bill!

If you have fixes that could help save someone time on any equipment, please mail it in with your Common Point Acknowledgement to my attention: Jim Grignon, Workbench Quick Fix.

Get a FREE Nortronic Splicer - QM333- with every Nortronic head ordered through June 30, 1981. Call Jim at A.V.E. Electronic 414-426-2201 for Nortronic's parts and information.

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Display ads -- \$25.00 per col. inch.

All information should be in our hands seven to ten days prior to month end.

Space for Common Point classifieds is provided as a service for our readers. All information and claims are the sole responsibility of those providing information and not Electronic Industries.



# PERSONS' CONVENTION POST SCRIPTS

by Mark Persons



The 59th Annual Association of Broadcasters' Annual Convention in Las Vegas April 12 - 15 was a success. However, it was more than a national get-together as broadcasters from Canada, Mexico, Great Britain and Japan were easily spotted. I am sure many other countries were represented as well in the 20,000 who attended.

Did I say the convention was held in Las Vegas? I meant to say it was held in the city of Lost Wages. Many broadcasters brought their spouses and in their spare time tried to beat the odds at the gaming tables or got sore arms pulling on the one armed bandits that could be found everywhere.

Nearly five acres of exhibit floors at the convention were jammed with new products and broadcasters eager to see them. Our American free enterprise system is working well in broadcast product manufacturing. This is evidenced by the number of manufacturers who are competing for the broadcaster's dollar by attempting to build better and more cost effective products.

One of the most popular engineering workshops was on telephone talk shows. A standing room only crowd adjourned to a conference room to quiz experts after they ran out of time in the regular meeting room.

Wallace "Wally" Johnson, formerly with F.C.C., and now executive director of the Association for Broadcast Engineering Standards, was presented with the "Engineering Achievement Award" for his lifelong work in broadcast engineering.

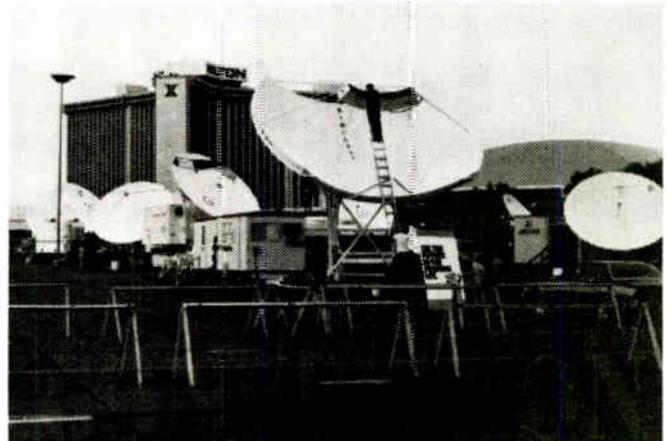
One of the most rapidly growing areas of interest to broadcasters is satellite earth stations both for television and radio. A growing number of companies showed

downlink dishes. Satellites are making possible the transmission of audio which is often better than that of the station using it. Noise, distortion and phase problems are all but eliminated when using satellites.

Bob Hope wrapped up the convention at the joint luncheon on Wednesday afternoon singing and telling one side-splitting joke after another. He hasn't lost any of the pizzaz that has characterized his career.

It was a very good convention to experience and learn from. There was so much to do that, in this writer's opinion, it could be extended one extra day without problem next year.

\*\*\*\*\*



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