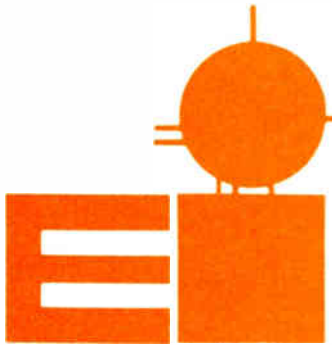


July 1988

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## NAB Asks FCC to Accept Only Certain Noncommercial FM Translator Applications

WASHINGTON, -- In a motion for stay filed at the Federal Communications Commission, the National Association of Broadcasters asked that, of the applications for noncommercial education FM (NCE-FM) translators, the agency accept only those that will employ over-the-air pickup of the primary station to be rebroadcast.

Joining NAB were National Public Radio, National Federation of Community Broadcasters and the Association of Maximum Service Telecasters.

In March, the FCC decided to authorize NCE-FM stations to provide station-owned NCE-FM translators with program feeds via satellite, microwave link or any other alternative signal delivery method deemed suitable by the licensee. NAB said the ruling, which would become effective on May 31, threatens to reduce dramatically the availability of spectrum which could be used by public radio and public translators, to the detriment of full, local radio service.

NAB Radio Allocations Task Force Chairman J.D. Williamson II said, "We strongly oppose the FCC's decision to allow such program feeds to noncommercial FM translators. The obvious result of such rule changes would be the creation of hundreds of satellite-fed low power radio stations at the expense of local public radio and would threaten ability to provide current or future enhanced service. Low-power FM radio stations do not make com-

munications policy sense for either commercial or noncommercial radio." Williamson is vice president, WKBN Broadcasting Corp., Youngstown, OH.

The four broadcast organizations plan to file individual reconsideration petitions with the Commission. They also have asked the FCC to include the use of NCE-FM translators in its pending inquiry reviewing the role of FM translators.

NAB said the alternative signal delivery rule will deplete currently limited NCE-FM spectrum, undermine localism and community access to local spectrum, create a "land-rush" application process, and lead to interference on the reserved FM band and to Channel 6 television stations.

By its action, NAB said, "the Commission has not simply expanded noncommercial service, but rather it has created a mechanism for the introduction of a new and unwarranted low power FM service in the NCE reserved portion of the FM band."

NAB noted that the FCC has twice before rejected proposals to amend the translator rule for alternative-signal delivery because of the adverse impact it would have on full-service radio. It said there have been only insignificant changes in circumstances since that time.

\*\*\*\*\*

## FCC Ponders Alternative Signal Delivery FM Translators

NAB asked FCC last week to stay a ruling effective May 31 which "threatens to reduce dramatically the availability of spectrum which could be used by public radio and public translators, to the detriment of full local radio service." Joining in stay motion were National Public Radio, National Federation of Community Broadcasters and Association of Maximum Service Telecasters. NAB asked FCC to accept only applications for non-commercial educational FM (NCE-FM) translators that will use over-the-air pickup of the primary station to be rebroadcast. (FCC decided in March to allow NCE-FMs to provide station-owned NCE-FM translators which program feeds by satellite, microwave link or any other alternative delivery method deemed suitable by licensee.)

According to Radio Allocations Task Force Chairman J.D. Williamson II, the ruling would "create hundreds of satellite-fed low power stations at the expense of local public radio, which would threaten its ability to provide current or future enhanced service." Williamson, of WKBN Broadcasting Corp., Youngstown, OH, said low power FM stations do not make communications policy sense "for either commercial or non-commercial radio." NAB, NPR, NCFB and MST will file reconsideration petitions with FCC; they also have asked FCC to include use of NCE-FM translators in FCC's pending inquiry into role of FM translators.

\*\*\*\*\*

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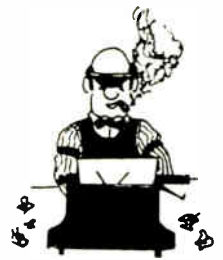


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## KANSAS LOTTERY DOUBLES RADIO BUDGET

The Kansas Association of Broadcasters was instrumental in receiving a commitment from Kansas Lottery Commission to double its radio budget, including a statewide buy for all Kansas stations. Call KAB at (913) 235-1307 for more info.

## Editor's Notebook



Ye Olde Editor

We have an article on an interesting product in this issue of *Common Point*. If your on-air board is not a late model, you probably do not have telephone "MixMinus" on it where you can feed program down the line simultaneously with receiving your remote feed. Any board can be easily and inexpensively converted to "MixMinus" with Henry MixMinus Plus Differential Summing Amplifier discussed on page 3.

Also this month another University Sound feature on wiring XLR connectors and Dave Metz has some fun with Power Tubes.

Thanks for all your reply cards last month for our subscription audit. By returning your card you will be kept on the *Common Point* mailing list for another year. Also had lots of address changes to take care of as well.

Electro Voice has a new mike that features Electret output level on a dynamic mike...revolutionary development which represents the future for boardcast microphones.

With the dryness we have been experiencing across the nation, I hope your AM antenna fields aren't causing you too much trouble because of lack of conductivity. It has for some.

Until next month, have fun and pray for rain.

Bob Stroebel  
*Common Point Editor*  
\*\*\*\*\*

## COMMON POINT READINGS

New Products ..... 10-11  
Metz ..... 14



# MixMinus Plus™

**Differential Summing Amplifier**  
**Henry Engineering**  
 503 Key Vista Drive  
 Sierra Madre, CA 91024  
 (818) 355-3656

## Description:

MixMinus Plus is a differential summing amplifier designed to add a "MixMinus" output to a broadcast audio console that lacks this feature. A MixMinus output is usually used to feed the "Send" input of a telephone hybrid device. MixMinus Plus generates this signal by electrically subtracting the hybrid Receive audio from the Program output of the console, to create a Program bus mix minus the caller audio.

## Installation:

MixMinus Plus (MMP) has two inputs and one output. The inputs are connected to the console; the output is connected to the hybrid Send input. All circuits may be wired balanced or unbalanced. Both inputs are 10K bridging. The output will drive a 600 ohm load to +26dBm.

Connect the Program output of the console to the PGM terminals on the MMP. This circuit will probably be balanced. The level should be between +4 and +8dBm.

The TEL input on the MMP must be connected **within** the console. It should be wired to the channel that is fed by the receive output of the hybrid. Locate a point in the console circuitry that permits tapping receive audio **after** the channel fader (step attenuator, etc.) or the output of the amplifier stage (if any) that follows the fader. (Do not connect to the summing bus.) The audio level should be between -10 and -28dBm. This circuit will probably be unbalanced; connect it to the TEL (+) terminal on the MMP. Install a jumper between the TEL (-) terminal and GND. Connect the GND of the MMP to the Ground of the console.

## Null Adjustment:

Temporarily connect an AC voltmeter, scope, or pair of HI-Z headphones to the OUTPUT terminals of the MMP. Assign the 'phone' channel to the Program bus of the console, turn on the hybrid, and feed

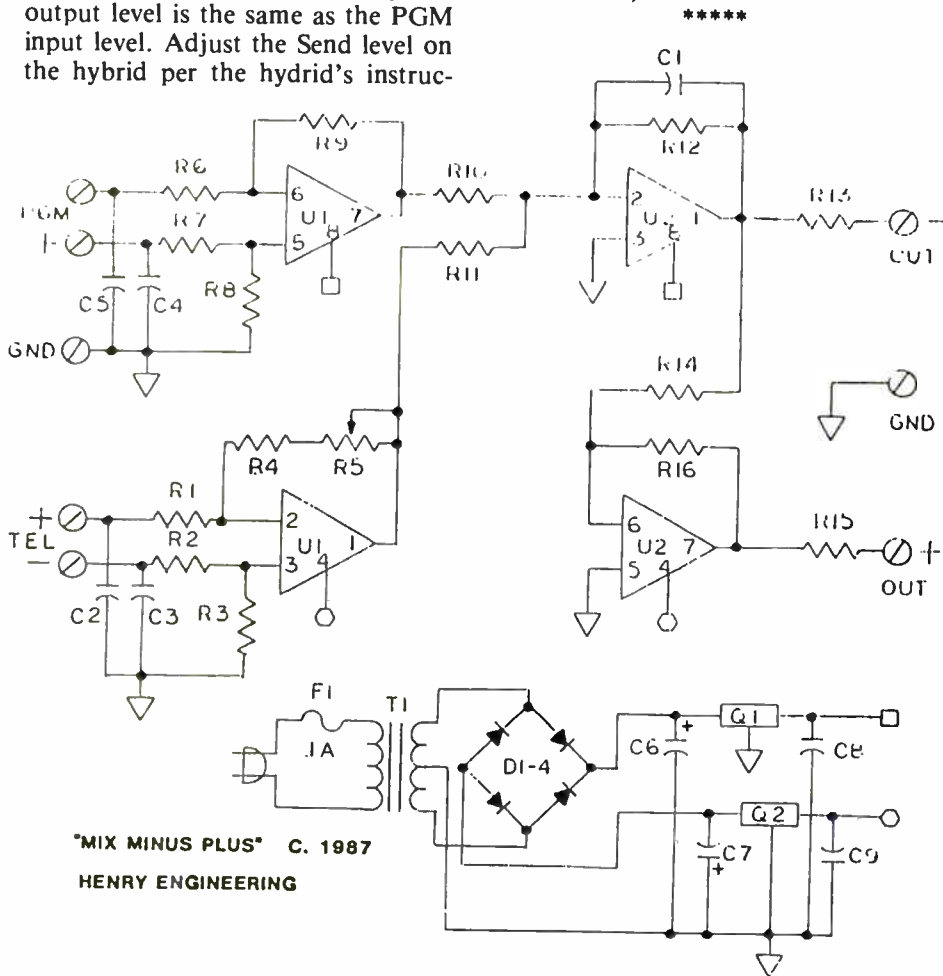
a dial tone into the console. Set the 'phone' channel fader so the dial tone reads 0 on the console VU meter. Monitor the output of the MMP while slowly turning the NULL ADJ trimpot. Set the NULL ADJ to provide **minimum** dial tone level. If a null cannot be attained (level goes up, but no null), **reverse the polarity** of the PGM input to the MMP. Re-adjust the NULL ADJ for minimum dial tone.

Now connect the MMP OUTPUT to the Send input of the hybrid. The overall gain of the MMP is unity: it's output level is the same as the PGM input level. Adjust the Send level on the hybrid per the hybrid's instruc-

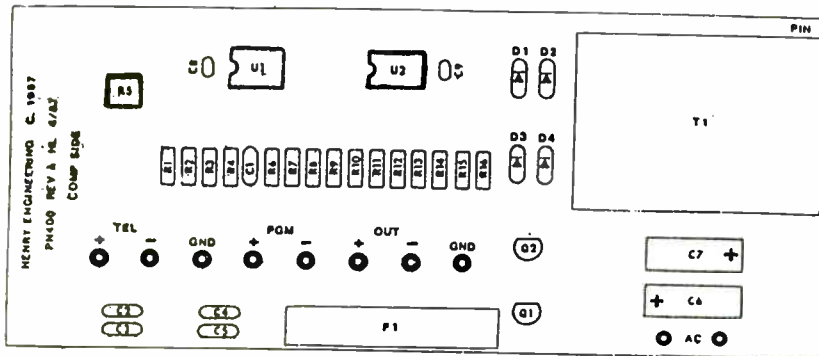
tion manual to provide adequate Program level to the caller.

NOTE: If a null cannot be attained, check the input levels to the MMP. If the levels are outside the limits described above, **consult the factory**. The MMP can be easily modified to work with different input levels. Henry Engineering will be glad to assist to make the MixMinus Plus work with your particular console.

\*\*\*When the hybrid is not in use (off-air), set the phone-channel fader on the console of OFF (maximum attenuation).



"MIX MINUS PLUS" C. 1987  
 HENRY ENGINEERING



PARTS LIST:

R1,2	10.0K
R3	100 K
R4	39 K
R5	250 K
R6,7	10.0K
R8,9	4.99K
R10-12	10.0K
R13	47ohm
R14	10.0K
R15	47ohm
R16	10.0K
C1	300µf
C2-5	.001µf
C6,7	100µf
DI-4	1N4004
Q1	7815
Q2	7915
U1	LF353
U2	NE5532

## Electro-Voice: Technology Push

BUCHANAN, MI—The beginnings of Electro-Voice began in a South Bend, IN, basement in 1927 when 14-year-old Al Kahn opened his own radio repair business. The future Electro-Voice president was not just tinkering around—he set out to make problem solving products that would be reliable and durable even under the worst possible conditions.

Today, E-V is one of the leaders in producing electret microphones. Electro-Voice designs, manufactures, and markets microphones for live music reinforcement, recording, and PA; loudspeakers, drivers, and horns for PA, stage, and concert sound installations; amplifiers and mixers for live music, recording, and PA use; and cinema audio systems for motion pictures.

### Evolution Of A Leader

The microphone business was in its early stages in 1927 when Kahn established his radio repair shop, "Radio Engineers." Here, Kahn and a friend, Al Burroughs, began making microphones to use in their PA systems. Later, they sold the systems to people who wouldn't buy them any other way.

In 1930, Kahn and Burroughs designed a public address system for the University of Notre Dame's four football practice fields. Knute Rockne, Notre Dame's football coach, used the PA system to supervise his team on the fields. According to Electro-Voice, the company's name was inspired by Rockne who referred to the system as his "electric voice."

That year Electro-Voice became incorporated and became involved in the installation and rental of public address systems for churches and other public buildings. And politicians started using the microphone as a power tool to reach the masses. E-V established itself during the great depression—at first manufacturing microphones for itself and later more so for the sale to others.

### First Breakthrough

The E-V team had its first major breakthrough in 1934. They invented the humbucking coil, which solved major problems for microphone users. According to an early E-V catalog, the V-1 velocity mic "can be used within 18 inches of an AC line. No other velocity microphone in its price field has this feature at the present time."

E-V continued to try to improve upon its new product and the next year E-V devel-

oped a method for stretching dynamic mic diaphragms *before* assembly. This method saved manufacturing costs. By 1938, E-V had produced several hand-held dynamic microphone designs. The Model 600 was described in E-V product literature as offering "Blast-proof high-fidelity, close talking...ideal for sports announcing, mobile PA, aircraft, police and general PA and communication work."

During World War II, a noise-canceling microphone was needed for clear voice communications on the battlefield. Kahn and Burroughs came up with a mic design which used 180 degree phase shift to cancel background noise. They engineered a lip microphone incorporating the new invention. Shortly after introducing the new mic to the military, production started. Employment grew from six staff personnel to almost 500 and production peaked to 2,000 a day.

E-V moved from the basement to a large building in Buchanan, MI, where the company is still headquartered today. After the war, E-V noise-canceling mics were used in civilian aircraft, off-road construction equipment, mining, and railroad environments.

Although little was known in 1946 about synthetic plastic, Burroughs decided to try using it to develop an improved diaphragm material for ruggedness and durability. He formulated a new film material which he called "acoustalloy." His new found formula was a major breakthrough for E-V as well as the industry. Acoustalloy retained its shape—even under the worst conditions—and was difficult to damage. In addition, it didn't have the inherent "tinny" sound of aluminum diaphragms and greatly improved the quality of the sound. Shortly after, E-V began marketing the new dynamic mics to radio broadcasters.

### On To Loudspeakers

By the late 1940s, E-V hired some people who had experience in the design and manufacture of loudspeakers. Much of the early work included loudspeakers for the home, such as the Patrician series and later, smaller-format bookshelf systems. E-V developed the first loudspeaker with directional control of high frequencies, referred to as "constant directivity." These and many other contributions have led to more than 160 patents in the area of speaker design.

In the 1950s, Electro-Voice began experimenting with the electret concept.

E-V engineers developed experimental transducers based on thin plastic films at a time when electret researchers were still working with thick wax blocks. The electret concept would not become a reality until the next decade when more suitable plastic films were developed. The process developed at E-V, which allowed electret charging with no degradation of the plastic film, is still a trade secret today.

Within the next few years Electro-Voice pioneered the first anechoic chamber to be built outside a laboratory. The chamber became an important research and quality control tool. E-V also pioneered the use of holographic interferometry to study the motion of microphone diaphragms. Since then, holographic interferometry has been an important tool in standardizing manufacturing processes to insure uniform performance of products.

### The Variable-D Mic

In 1954, E-V introduced and patented the Variable-D microphone, which effectively eliminated proximity effect through a multiple port design at the rear of the diaphragm. This provided more uniform frequency response at all angles of incidence and a more natural sound at all miking distances. Today, the RE20, a Variable-D design, is one of the most popular microphones used for voice recording and reinforcement.

Electro-Voice is also one of the very few manufacturers ever to receive the Motion Picture Industry's Academy Award for the development of a new microphone. The model 642 Cardiline long-range pick-up mic received this award in 1963.

A few years later, Electro-Voice was acquired by Gulton Industries and gross national sales climbed to \$20 million. During this time, competition for E-V microphones became fierce. According to Kahn, the situation was enjoyable because the competitors were businesslike and honorable. He said the focus of the competition was performance and technology, not price, and the benefits for the customer were always the bottom line.

Today, Kahn's original concept for durable, reliable products that will withstand even the most adverse conditions can be found in many applications. E-V mics are used for intelligible communications in extremely noisy military environments such as helicopters and high-speed tanks. In a NASA Skylab mission, specially designed microphones and speakers were shot into space for use by astronauts during docking procedures. Even with a lost heat shield, the equipment functioned without fail throughout Skylab's six years in orbit.

"From the start, Al Kahn built into the culture of EV that its mission was to design and manufacture products that solved problems and filled needs," said Paul McGuire, E-V vice president of sales and

continued from page 4

marketing. "The philosophy first manifested itself when E-V created Knute Rockne's Electric Voice and reached a high level of maturity with the introduction of the EV635 in 1967—a product that for more than 20 years has held the position of 'industry standard' in broadcast microphones.

"This philosophy is stronger today at E-V than it ever was. New problem solving products like the RE45N/D, the N/DYM 1 compression driver, and the Delta Max reflect that we not only embrace Al's philosophy of business, we pursue it with a passion."

EDITORS NOTE: Electronic Industries Inc. is an ElectroVoice Master Distributor and has been associated with E-V for over 25 years.

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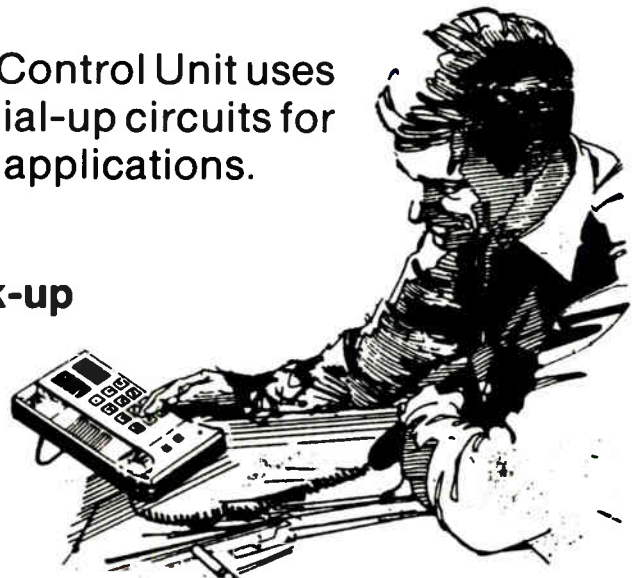
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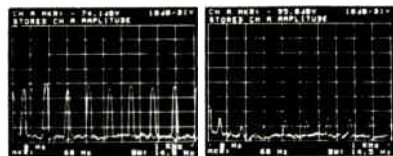
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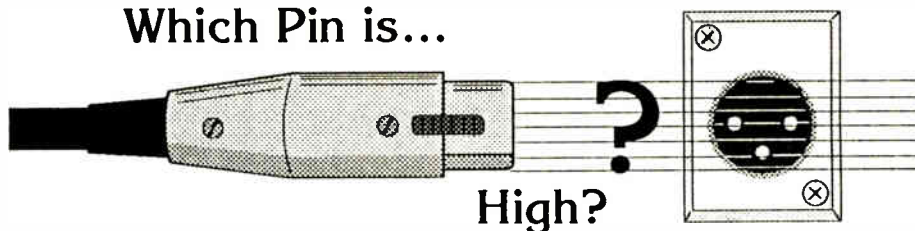
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## Which Pin is...



**W**hich pin is high?" is perhaps the most often asked question when one attempts to set up any sound system. In case you're not exactly sure what the question means, it pertains to the polarity of XLR-3 or similar 3-pin professional audio connectors.

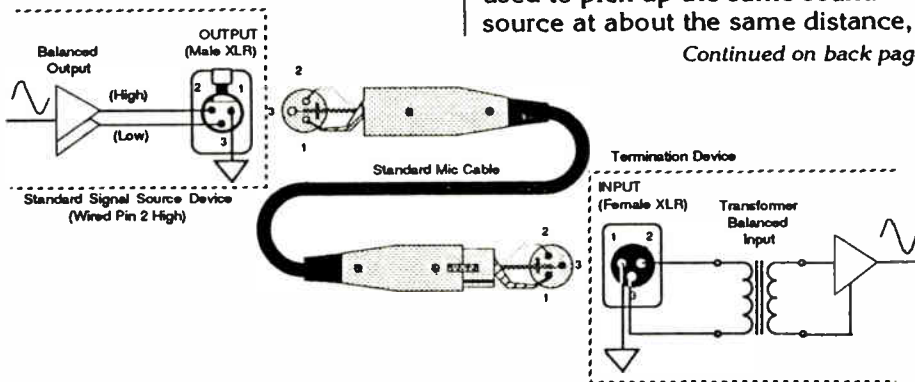
As you probably know, in a balanced or floating circuit, two conductors carry the audio signal; one is designated as the "high" or "+" conductor, and the other as the "low" or "-" conductor. The shield is merely a ground and does not carry signals. When such a cable is wired to an XLR-3 connector, the present convention is that pin 2 of the connector be attached to the "high" side of the cable, pin 3 to the "low" side, and pin 1 to the shield. This standard has been adopted by DIN, JIS and the EIA.

(Pin 2 of an XLR should also correspond to the tip of a tip/ring/sleeve phone plug, and Pin 3 to the ring of such a plug.)

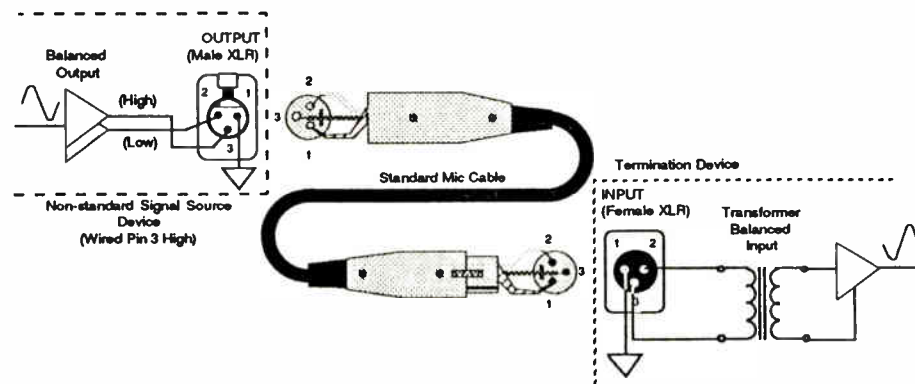
The confusion arises in some circles because at one time certain manufacturers, prominently one US microphone manufacturer, built products wherein the wiring to pins 2 and 3 was swapped (effectively reversing the polarity of the connections.) Pin 1 has always been the shield connection. Unfortunately, some mics and other equipment (especially older equipment) are still out there with the now obsolete "pin 3 high" wiring.

What happens if you wire a "pin 3 high" mic to a now standard "pin 2 high" console or recorder? Well, probably you will notice no difference at all... at least not in a single channel. However, if two mics are used to pick up the same sound source at about the same distance,

*Continued on back page*



Standard "Pin 2 High" Balanced Connection



Non-Standard "Pin-3 High" Balanced Connection  
(Polarity is reversed)

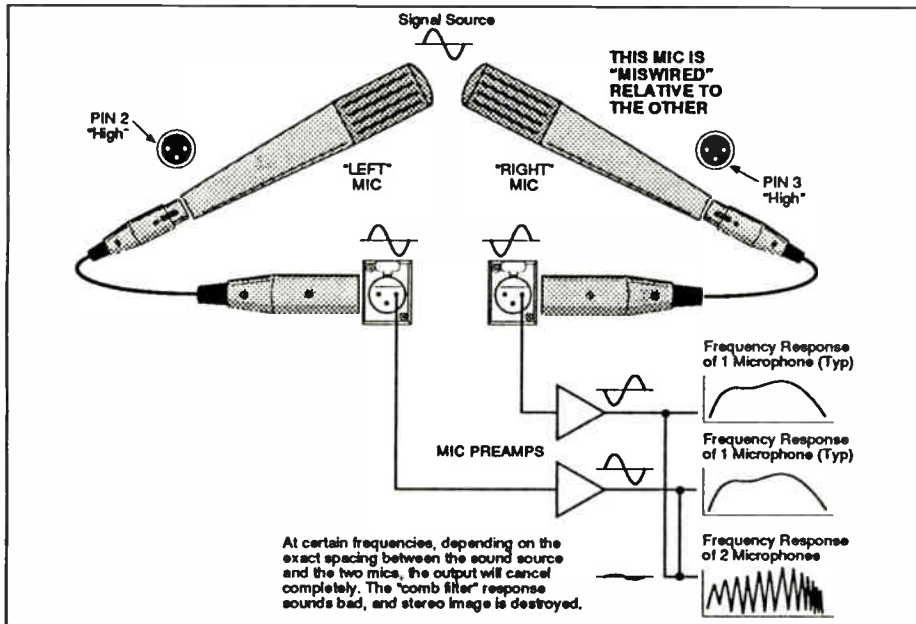
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and both are not wired with the same convention, then the stereo image (assuming a stereo mic setup) will be destroyed and/or the mono combination of the two signals will result in severe cancellations at certain frequencies (the "comb-filter" effect).

cilloscope), you can perform a simple test. Create a positive-going waveform (a pulse or the positive-going initiation of a sine or square wave). This can be done by connecting the battery briefly across the loudspeaker and watching to see that the cone moves outward (toward the mic). Place the mic in

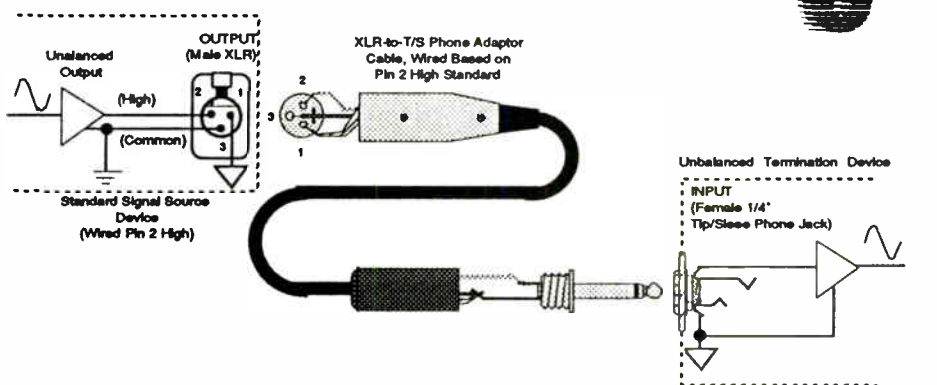
front of the phase checker or speaker, and then examine the output of the mic. A phase checker can give you a direct reading of the pulse polarity, or the scope can show you the waveform. With a positive-going pulse entering the mic, the positive going waveform should be output on pin 2 of the XLR (be sure you first test the mic directly, with test probes and not a mic cable, so you know its output is on the correct pin). Now, if you wish, simply connect the mic to a console, recorder, preamp, etc., and then examine the output of that device with the phase checker or scope. Once again, a positive-going input to the mic should produce a positive-going output on pin 2 of the XLR. If you have a balanced input and unbalanced output (or vice-versa) on a given piece of equipment, check the polarity here to be certain that a positive-going signal on the high side of the unbalanced connection corresponds to a positive-going signal on pin 2 of the XLR.

Remember, *pin 2 is high!*

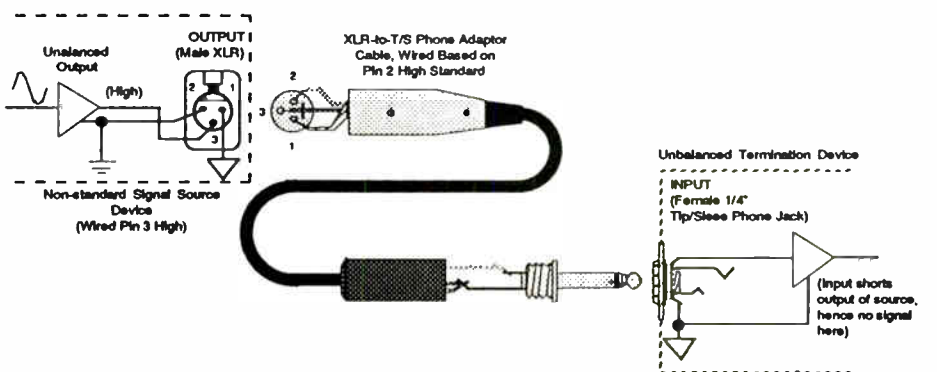


The problems can significantly increase when XLR connectors are installed with unbalanced equipment. (Many power amps are unbalanced but provide XLR input connectors as a convenience so the sound company can use standard mic cables for hook-up.) If the output of an unbalanced device happens to be wired to an XLR-3 on another unbalanced device, and the "pin 2 vs pin 3" polarity is not the same on both devices, then the signal will be shorted to ground, and no audio will get through, as illustrated to the right. It might even cause the output to fail. Similar problems will occur if someone sticks an XLR connector on the end of a cable from an unbalanced mic and care is not taken to ensure correct polarity.

How can you determine whether a system is properly wired? For one thing, check the manufacturer's specifications for each piece of equipment to see how the XLRs are supposed to be wired. Then check the cables to make sure there are not inadvertent polarity reversals. Finally, if you have a phase checker (or even a battery, cone-type loudspeaker, mic, and an os-



Standard Unbalanced "Pin 2 High" XLR-to-Unbalanced Phone Connection

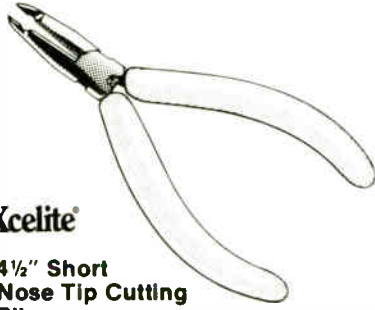


Non-Standard "Pin-3 High" XLR-to-Unbalanced Phone Connection (polarity is reversed at output, and thus shorted by input)

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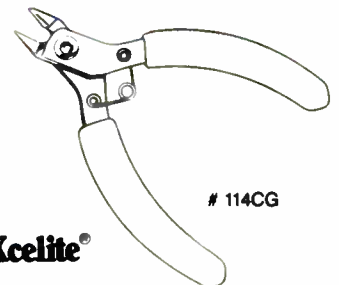


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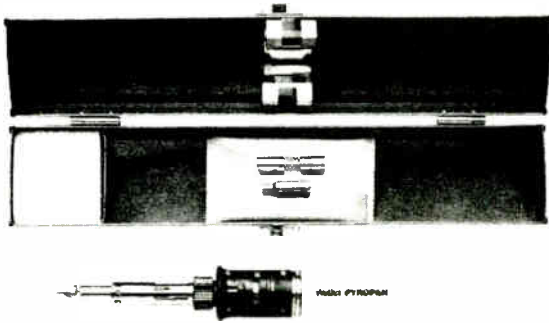
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WSTA3	47228	Cordless Pyropen soldering iron

OUR SPECIAL  
\$47.87 ea.  
reg. \$66.62 ea.

## SPECIAL NOW ON SALE

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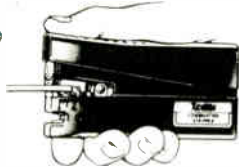
CAT. # R3322 - 3/32" TIP

CAT. # R181 - 1/8" TIP

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Common Point/July 1988  
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# E.I. Spotlight on New Products

Telex debuted its new FMR-25 wireless microphone systems at NSCA. The systems all have a RF frequency range of 165 to 185 MHz, AF frequency range of 85 to 15000 Hz, and signal-to-noise ratio of 90 dB.

The WT-25 belt pack, which comes with a electret, omnidirectional microphone, and the HT-100/10 handheld condenser, cardioid microphone/transmitter each have an RF power output of 50 mW maximum, an internal compressor and pre-emphasis of 50 uSec.

The FMR-25 TD Pos-i-Phase True diversity receiver and the FMR-25 single antenna system each feature image rejection of 70 dB and immediate frequency of 10.7 MHz.

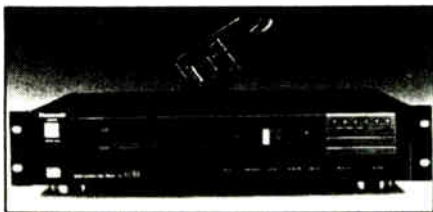
—Audio-Technica has introduced its 40 Series microphones, which can be used for professional recording and broadcast as well as for sound installations. The three models are the AT4049 omnidirectional capacitor, the 4051 cardioid capacitor, and the AT4053 hypercardioid.

The AT4049 combines the benefits of low self-noise with very high output and handles very high sound pressure levels—up to 142 dB SPL while producing no greater than 1 percent THD, according to the company. An optional AT4921 capsule output attenuator may be inserted between the AT 4049's head capsule and electronics.

The AT4051 features a smooth frequency response, according to the company, the off-axis response is well controlled, yielding uniform cardioid polar patterns.

The AT4053's balanced output is direct-coupled. An integral 80 Hz hi-pass filter provides switching from flat frequency response to a low-end roll-off.

Toa has announced its MR-8T eight-track cassette recorder. Recording at 3.75 ips, the unit achieves a frequency response of 20 Hz-18 kHz, with high-bias tapes. The MR-8T is rack-mountable for on-location recording, and home/studio recording is facilitated by a built-in mixer. The unit includes dbx noise reduction, a 12-step LED VU meter and individual outputs for each track, along with sync and remote



punch-in capabilities. Connectors are furnished for external remote control, and buss access is also provided, for hook-up to an optional matrix assigner. Recording preamps with level controls let the user record instruments or mics directly, allowing adjustment of each. Stereo mixdown is achieved via controls on each track for playback level to the stereo mixdown busses.

Studer Revox debuted its C270 family of professional tape recorders at NSCA. The C270 two track, the C274 four track and the C278 eight track machines all have three speeds and any pair may be selected and changed quickly in the field.

All three have microprocessor controlled transport, constant tape tension on both supply and take-up spooling motors, Dolby HX Pro headroom extension and proprietary phase compensated audio electronics, fully modular audio electronics, three peak record LED indicators, front access to all audio electronics even while rack mounted, and scrape-flutter filter with precision ceramic guide between erase and record heads.



Aphex Systems has debuted the newest addition to its line of dynamics processors. The model 612 expander/gate uses downward expansion with a variable ratio (1:1 to 20:1). The unit can serve as a ducker, allowing a key input to lower the level of the audio input. Key features are variable high and low pass filters which may be switched in and out of the circuitry; adjustable threshold from -30 to +20 dBm; variable attack time; adjustable release time from 40 milliseconds to 4 seconds; adjustable expansion range from 0 to 100 dB; servo-balanced inputs and outputs; and multi-voltage operation. The 612 utilizes the Aphex VCA 1001.

Switchcraft is marketing an audio patch panel available in a variety of configurations. It comes completely assembled, fully shielded, and ready for 19-inch rack mounting. Another version features a rack-mountable front panel with the rear panel designed for remote mounting. The rear panel is available with insulation displacement connectors inside and outside, with all circuits clearly identified. Each patch panel has two large horizontal strips and two vertical designation strips, to identify 48 conductor jacks.

The suggested retail price is \$700. Units will be available in September.

Electro-Voice displayed its DeltaMax, a processor controlled speaker system, at NSCA. Two versions of DeltaMax systems currently comprise the series—a compact 12-inch two way and a 15-inch two way.

Both systems, the 15-inch DML-1152 and the 12-inch DML-1122, are constructed of void-free birch plywood in a trapezoidal shape. An optional, three point flying system with steel-reinforced aircraft-type pan-fitting hardware allows the system to be flown in multi-cabinet arrays.

Shure has announced its SM99 supercardioid microphone. The SM99 is designed for multi-mic sound reinforcement installations such as churches, schools, courtrooms, council chambers, boardrooms, and broadcast studios. It can be used on lecterns, pulpits and conference tables as well as for reproduction of acoustic instruments.

The SM99's quiet circuitry provides a wide dynamic range and is fully protected from RFI and electromagnetic hum pickup. The mic has a frequency response of 80 to 20,000 Hz and an impedance rating of 150 ohms.

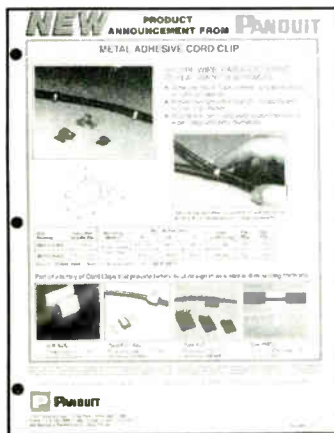
QSC has introduced the model 2000 into its MX series of power amplifiers. Based on the technology of the manufacturer's Series Three amplifiers, the MX 2000 delivers 625 watts per channel at 4 ohms.

The MX 2000 is a dual monaural unit, allowing each of its two channels to operate as an independent amplifier, sharing only AC cord and power switch. Occupying three rack spaces, the unit utilizes a forced air cooling system which permits high duty cycle operation with low impedance loads. The cooling system can be adjusted by a two-speed front panel control. A high-efficiency output circuit reduces waste heat.

## More New Products

Audio-Technica has debut its 900 series, a trio of professional headphones for professional broadcasters and recording engineers. Models ATH909 and ATH911 are open-back designs, allowing the user to hear outside sounds while monitoring program material. When isolation from ambient sound is required, the AT910 is designed to allow on-mike operation at high monitor levels, without feedback. The new headphones feature 96 dB sensitivity, 4-24 ohms matching impedance, 30 ohms actual impedance, and 20-20,000 Hz frequency response. All three models include a 3-meter straight cord with 0.25-inch phone plug.

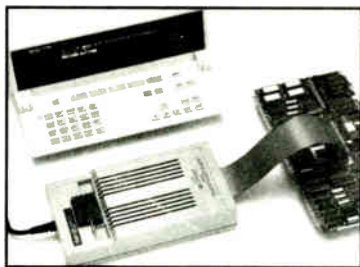
AKG has released the D90S and D95S microphones, featuring zinc/aluminum diecast housings, mat-sandblasted stainless steel wire mesh grilles, integrated wind and pop filter, lockable on/off switch, feedback-safe polar response pattern, and wideband frequency range. The mics are designed for a range of uses, from vocals and instruments, to sound reinforcement and home recording studio applications.



**PANDUIT — Cord clip:** The MACC is a metal adhesive cord clip for securing wire, cable or tubing to flat, smooth surfaces.

The easily installed clip can be opened or closed, without damage to the clip, to remove or add wires quickly and easily. Two clips sizes are available for bundle diameters up to .62 of an inch.

The clips are made of plated steel and are de-burred to prevent wire abrasion.



**FLUKE — Emulative testers:** HyperTEST is a fast functional memory testing for Fluke's 9100A Digital Test System and 9000 Series Micro-System Troubleshooter.

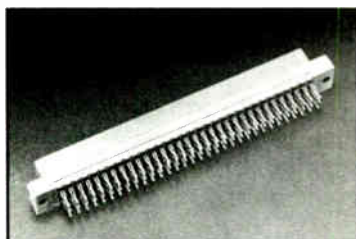
The new algorithms for testing RAM and ROM reside in the micro-processor interface pod for the 9000/9100 memory tests. The new testing method is said to perform RAM tests up to 60 times faster while maintaining fault coverage comparable to the present built-in 9000/9100 memory tests.

ROM tests are performed at approximately five times the present speed.

**BEYER—Microphone:** The M58 omnidirectional mic was designed specifically for use in electronic news gathering and electronic field production.

The unit incorporates an internal shock mount system for the purpose of reducing undesirable handling noise. The microphone is said to be suitable for lengthy interviews.

It features a slim profile for minimal camera appearance.



**PANDUIT—Pin connectors:** Offering circuit positions, the Eurocard pin female connectors are part of the company's HI-CON Series 100 connector line.

Fully coined edges on the compliant section is designed to reduce stress on through-plated holes, while full contact supports permits termination with "Flat Rock" tooling.

The connectors are available with 8, 15 and 30 microinch selective gold plating.

## AM Radio: A Crisis Situation

by Dutch Doelitsch  
WDDD/Marion, IL

From the smallest micro-market to the largest mega-market, the erosion of AM audience continues. What we broadcasters, the FCC, and Congress do (or don't do) in the next 12 months will determine, to a large extent, the future of the medium.

AM radio has many success stories on individual stations which are increasing audience and providing outstanding broadcast services. Yet these successes are far outnumbered by the thousands of AM stations on the decline. Fortunately, the NAB, the FCC, and individual broadcasters are now coming to the realization that simply attacking single aspects of the problem will not be enough.

If any station is going to survive, it must be able to serve a marketplace with a fulltime signal. With the advent of FM the public no longer had to settle for daytime only, or weak and noisy nighttime coverage. It's no wonder audiences left AM when an alternative became available. It's also no wonder that AM broadcasters have now placed priority emphasis on full-time quality service directed at a close-in audience, rather than emphasizing the size of the service area with little regard for audio quality.

The fact that the AM band is so crowded has added to the problem. The "more is better" philosophy has created substandard service and over-competition which, instead of promoting better service, is actually strangling local broadcasting. Docket 80-90 FMs will increase the competitive pressure on AMs and FMs.

AM's crisis is at a critical point. However, if we act to provide a quality delivery system that functions in a truly free marketplace, we can turn the AM crisis into the AM opportunity.

# Alpha Wire For Broadcasters

ELIZABETH, NJ—A new line of high-performance, readily available wire, cable, and accessory products from Alpha Wire Corporation will meet the special needs of engineers in broadcast and related fields, according to Dennis Gudgel, Alpha broadcast manager.

"Alpha's entry into the broadcast cable market represents a new opportunity for engineers to get the high-performance cable they need with fast turnaround in small or large quantities," said Alan P. Marconi, Alpha corporate vice president of marketing.

The Alpha line includes video, audio, microphone, data and coaxial cable and accessories for indoor and outdoor use.

"We developed this line especially to meet critical needs of broadcast and studio engineers," said Gudgel. "We've engineered key products to

provide in-studio response which is the best in the industry."

Gudgel pointed to Alpha's line of 75 precision video cable, which offers a structural return loss of -30 dB over a frequency range of one to 300 MHz, better than the industry standard. He says that results in the best picture quality. The precision video line offers cable to meet needs for indoor, rugged outdoor and plenum installations. It's also available in an extra-flexible grade, and most are available in a variety of bright jacket colors.

Alpha's extra-flexible microphone cable features high-density Starquad design that reduces hum and noise to less than 10 percent of that with conventional two-conductor microphone cable, according to the company. It's also excellent for line-level signals, such as feeds from mixers to amps.

Alpha's coaxial cable meets a broad

range of RG standards. There's also a plenum-rated line of coaxial cable which passes UL VW-1 flame test and can be used without conduit. Typical applications include data loggers, local net installations, CRT or VDU installations and closed-circuit TV.

Much of the planning for the Alpha broadcast line built upon requests from and research into customers and their needs. "For example," said Gudgel, "chief engineers told us that they often need to identify critical cables in dark studios and racks. So we make a variety of our video, audio and microphone cables in bright colors to offer easy identification in the studio."

Electronic Industries Inc. is a Broadcast Distributor for Alpha Wire. Feel free to call us for any information.



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*The 528 Voice Processor works with any mic. It cleans up your signal by reducing control room noises from paper rattling and cart solenoids. It controls sibilance and "lip smacking," and adds just the right EQ to any mic, any control room. Get what you pay for, and then some, with the 528 Voice Processor. Call Dane Butcher for a detailed spec sheet.*

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**Electro-Voice®**  
a MARK IV company

**Model RE45N/D  
Cardiline® N/DYM™  
Dynamic Shotgun  
Microphone**

**LIST PRICE: \$375.00**

**INTRODUCTORY SPECIAL \$239.00**

**SPECIFICATIONS**

**Generating Element:**

Dynamic

**Frequency Response:**

150 to 15,000 Hz (Far)  
50 to 15,000 Hz (Close)  
(See Figure 1)

**Polar Pattern:**

Cardioid-line  
(See Figure 3)

**Impedance:**

600 ohms (nominal)

**Output Level:**

5 mV/Pascal at 1,000 Hz

**Sensitivity:**

- 50 dB at 1,000 Hz  
(0 dB = 1mW/10 dynes/cm<sup>2</sup>)

**Hum Pickup Level:**

- 130 dBm typical at 60 Hz  
in a 1 m OE field

**Magnetic Circuit:**

N/DYM™ magnet in a non-welded circuit

**Case Material:**

Aluminum, steel and high performance  
engineering plastics

**Dimensions:**

292 mm (11.50 in.) long  
48 mm (1.87 in.) diameter

**Finish:**

Black, non-reflecting

**Net Weight:**

212 g. (7.5 oz.)

**Microphone Connector:**

A3M

**Accessories Included:**

Warm-Grip™ handle  
323 stand clamp  
Zippered vinyl carrying case  
Windscreen

**Optional Accessories:**

307 shock mount  
312 microphone clamp  
380 attenuator  
PLC-25X cable  
PLC-25P cable

**DESCRIPTION AND APPLICATIONS**

The Model RE45N/D is a highly directional microphone utilizing a combination of characteristics of cardioid and distributed front opening designs. The microphone incorporates a revolutionary neodymium alloy magnet to provide high sensitivity and low weight. The exceptional sensitivity of the RE45N/D combined with the inherent low noise of a dynamic transducer insures a high signal-to-noise ratio necessary for those long reach applications. The transducer and integral high pass filtering have been designed to reduce most low frequency handling noises found in handheld applications.

The cardioid action gives the microphone uniform characteristics for frequencies up to 1,500 Hz. For frequencies above 1,500 Hz

the distributed front openings take effect providing narrower directional characteristics as illustrated in the polar pattern, Figure 3. Extra care has been taken in adjusting the directional pattern of this microphone to provide smooth off-axis frequency response. Older design wave-interference microphones often have large peaks and dips in the off-axis response. The irregular off-axis response of the older designs can create problems as the rejection varies widely as the microphone is moved only slightly due to the lobing of the polar pattern. The smooth RE45N/D polar pattern makes the aiming of the microphone at the desired sound source less critical than those older design shotgun microphones while still providing better directivity than that of conventional unidirectional microphones.

Benefits derived from this new design include wide range response, smooth polar response, high sensitivity and high directivity. These features make possible a working distance which is two to three times that of conventional directional microphones. The RE45N/D has been especially designed for handheld use and includes a switchable 250-Hz high-pass filter to further reduce wind and handling noise. The removable Warm-Grip™ handle is designed to fit over the microphone connector and the short handle of the microphone.

# MEMO FROM METZ



by  
David L. Metz

## Memo From Metz "Fun with Power Tubes"

First I'll start out with the dull part. Then I'll teach you a great old timers trick. Monitoring filament voltage is the dull part. You've heard this all before, but external anode tubes like the 4C<sub>x</sub>20,000 etc. like to have there filament at a exact 9.9 to 10.0 volts. Anymore then 10.0 and bye bye tube life.

These tubes emit their electrons directly from the filament, they have no cathode. The filaments are impregnated with carbon to enhance emission. The higher the filament temperature, the faster the carbon evaporates. So we keep the voltage down so the filament emits just enough electrons to keep the tube at its rated output.

I like many an engineer I nursed my tubes along, giving them just what they needed to make power. With better tubes and transmitters, I decided I no longer needed to milk the tubes and ran them at what I thought was 9.9 volts. After all that's what the filament voltage meter on the transmitter said.

Turned out the meter read 20% low! I ucky for me I caught the error in time and the tube wasn't damaged. After that I started to check the calibration of filament meters with my Fluke 8060A true R.M.S. A.C. digital voltmeter. I made a calibration chart for the panel meter and taped it right on the transmitter.

I hate crawling inside the guts of a running transmitter to make this periodic calibration check. Do this, put a pair of test jacks on the transmitter connected directly to the filament power terminals on the tube socket. Then you can test the voltage from the outside while running.

This brings to mind another idea. I keep my tubes hour and service log right on its own anode. Just write your engineering notes on the metal anode with a sharp point magic marker. You can't lose them and you'll always know the tubes history when you pull it.

Now the fun part, did you know you can repair your own power tubes? Yup, you can! Nope you can't restore lost emission. You can fix most interelectrode shorts though. Somebody invested this trick about three weeks after the first tube shorted. I first did this fix on a friends 3-500Z's used in his ham kilowatt amplifier. Later I fixed KFMH's 4CX10,000's and 4CX20,000's.

These tubes failed due to shorts between the elements inside. If you look inside a dud external anode tube, you'll find they have screen and control grids built like a wire cage. The individual wires run vertically between two metal rings. When the tube fails (shorts), one of the wires spot

welds fail and the wire springs over to touch another element.

OK, pull the dead tube and locate the shorted elements with your ohm meter. Then find a lamp cord and connect it to the shorted elements. Set the tube on a insulated surface, step back and plug the cord into an outlet.

Expect to hear a pop. Don't get scared if the circuit breaker trips. Unplug the cord, remove the leads and retest the tube. Every time I've done this fix, the shorted grid wire was vaporized and the tube returned to service.

I did it to one 3-500Z four times! And it worked several times on 4CX tubes in an emergency. In any case it's worth trying when you don't have a spare or want to win a beer on a bet.

\*\*\*\*\*

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FOR SALE: 1 Sencore SC61 Paul Trace Waveform analyzer (100 mhz) \$2000, 1 Sencore SG-165 stereo generator and analyzer \$700, 1 Optimod 800A, 1 Optimod St. Chassis with 8100 input cards, 1 Broadcast Elect. 3000 cart machine, 1 40 watt digital stereo exciter, 3 Scala FMV antenna, rated 100 watts, 2 tapecaster X700RP aux tone, excellent condition, 3 tapecaster X700P playback, excellent condition, 1 Spotmaster 500RP, 2 ITC premium - never used, 2 Russco turntables with armst pae amps, 1 McMartin FBS receiver, 1 delay cart machine, 1 Spotmaster 500 parts only, 1 SCM RA automation brain, 1 Shure SE20 pre amp new, 2 Ampex remote controls for 440's, 3 Howe rack mount mixers, Misc Altec and Fv studio monitors, 1 Macnie cord electronics, Jim Phillips WZOM, 414 Washington Ave, Defiance, Ohio 43512, 419-782-8591.

FOR SALE: Gates executive 10 channel console with new audio amplifier, one owner--\$1500. 812-386-1250, Steve Lankford WRAY P.O. Box 8, Princeton, IN 47670.

WANTED TO BUY: Used BF10S350 board KCLC-FM, Lindenwood College, St. Charles, MO 63301, 314-949-2000 ext. 262.

## **Fritts Calls for United Front for Compatible Advanced TV Standard**

CHICAGO -- National Association of Broadcasters President and CEO Edward O. Fritts today called on television receiver suppliers to join forces with NAB to help ensure a universally compatible standard for advanced television systems.

Fritts was the luncheon speaker at the Electronic Industries Association's annual convention at McCormick Place.

Fritts said that advanced television (ATV) "is the next giant step in TV technology, and it is right around the corner." ATV systems -- HDTV among them -- will provide wide screen pictures with sharper resolution than on present receivers and with compact disc-quality stereo sound.

He said that when the dust of research and planning has settled and it is time to move forward, two factors are imperative for ATV's wide acceptance by consumers.

The first, he said, is that everyone --broadcasters, cable systems, movies on tape, disc, and so on -- must use

## TALKBACK

**LIBBY, MO--**The expansion of FM translators (and TV too for that matter) must be stopped. If not, local radio -the backbone of the industry will die. Translator abuse has extended coverage for years.

**McCARNEI, II.--**Good article on "if the shoe fits" This is a real problem at our education station. Students try anything - and why do different plugs always appear when equipment is moved to another room? Is the mike plug (XLR) a mike, output, highlever or control and where is ground. Good job, look forward to each copy!

FOR SALE: Scientific Atlanta 9' commercial satellite system, complete with electronics \$1295.00; GF, mobil telephone (DTMF, Secode) 2, motorola, 47 mhz transceivers, 50 watt, (CTCSS) 206-875-5120 or 206-875-5554.

FOR SALE: Clasia FM/daytimer AM - 3 acres plus 2,800 sq. ft. Homestead- 750 sq. ft. transmitter building automation - all equipment excellent condition - retiring J.P. Robihard 1803 N. First St. Haynesville, LA 71038.

the same compatible ATV standard. "Your customers will demand that whatever new type of receiver they purchase is technically capable of receiving and displaying free, over-the-air stations, cable channels, perhaps direct satellite, and VCR tape. A new 'standard' can only be a 'standard' when it is THE 'standard' for everything."

Fritts said that the Federal Communications Commission should establish the ATV standard and not leave it to the marketplace to decide. "One clear, universal standard, void of public confusion, is truly in the best interest of consumers, your own businesses, manufacturers, the cable industry, and the American broadcaster."

The second point, he said, is directly related to the first. The FCC "must take all steps within its discretionary powers to ensure that the spectrum needs of free over-the-air broadcast consumers are given the Commission's highest priority."

He said that from what is known about the various ATV systems now undergoing experimentation, one major thing is absolutely certain: the FCC must set aside additional spectrum space for the possibility that

**WAYNESVILLE, MO--**I'm not a certified engineer, just had to learn maintenance through doing, as a necessity. Your engineering articles are quite helpful.

**ROGERS, AR--**I'm from Wisconsin but the winters just got too cold. Enjoyed reading about Kewaunee, Fond du Lac, etc., especially Rib 'Mountain' since I worked there for the state network. With a 5/8 end fed sloper on the tower, I was able to work Australia, using 100 watts. Had TV into ch 7 XMTR so had to wait till they signed off!

**GREENWOOD, MS--**Excellent little magazine. TNX for the subscription. **NEW ULM--MN--**I especially enjoyed the "construction" and "maintenance tips" articles.

**SHAWANO, WI--**Really enjoyed Marti article.

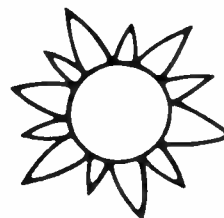
**ERWIN, TN--**I enjoy the stories of boardcasting in the "real world" like Stroebel's Magnificent Marti article this month. I definitely refer to your ads when selecting and comparing products and prices. Keep up the great works!

**ST. CHARLES, MO--**I'd be interested in hints for Marti units not so fortunate to be down in the 152-172 range. Enjoyed the comments!!

whichever ATV standard is chosen for universal American usage will require that additional spectrum.

The NAB chief executive also said the Association has commissioned a firm to come up with the "ultimate radio receiver" which he hopes will inspire new product designs. He said the receiver, which will be unveiled at NAB's radio convention this fall, will incorporate both AM and FM stereo -- with both AM stereo systems -- with the new FMX system for enhancing existing FM stereo signals, and with the new standards for AM audio reception.

\*\*\*\*\*



# RACK OUR BRAINS,

## STL SYSTEMS

The New 8600—Monaural

The 8300—Composite

The 7700B—Composite

## BTSC STEREO

The 850 BTSC TV Stereo Monitor

The 855 SAP/Pro Modulation Monitor

The 8500 TV Subcarrier System

## REMOTE CONTROL

The New 8610

## MONITORS

The 844 FM Stereo Off-Air Monitor

The 845 SCA Monitor

The 753/755A AM Off-Air Monitor

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