

RADIO GUIDE

TX 79902-1420

EL PASO
4180 N MESA ST
KLTG
CHIEF ENGINEER

BULK RATE
U.S. POSTAGE
PAID
ROCHESTER, MN
PERMIT 445

Address Correction Requested

A Forum for Radio Engineers
Ray Topp Editor/Publisher (507) 280-9668

March 1989

Volume 2 - Issue 3

Copyright 1989 - Rochester Radio

511 18th Street SE

Rochester, MN 55904

Sweet Sixteen

As you can see, the Radio Guide has expanded to sixteen pages. This was our final goal from the beginning and it's gratifying to see that it has happened long before it was due. The reason - - you've taken Radio Guide to heart and have assured me that it's on the right track. Best of all, and most importantly, many of you are contributing tech tips and articles.

Back in July, I wasn't all that sure Radio Guide was going to make it. I figured that engineers would appreciate a fresh nuts and bolts approach but, frankly, it wasn't going to go anywhere without advertising support. A paid subscription publication is a great idea, in principle, but it's a bear trying to make it work. The problem in the broadcasting industry is, that there just aren't enough potential readers to make that approach work.

At the very start, I decided to lay down a strict advertising policy. The advertisers you see in Radio Guide are there because they have paid for the space, and expect to sell more product with their advertisements. Furthermore, all the advertisers you see in the Guide realize that I will not prejudice any editorial copy because of it. Many of you have taken the time to call and write to compare the Radio Guide with the other trade publications. First of all, I do not consider the Radio Guide to be a true trade publication. We do not do product reviews or new equipment press releases, nor do we wish to! In my opinion, paid display advertising is the proper forum for that.

Now, straight to the point. What would any of us do without the other publications (one in particular - - do I have to say)? How have most of us learned about the AM Stereo "debate," the "engineer" controversy, FCC developments, and any one of a hundred topics affecting our industry. We read it - - and not necessarily in the Radio Guide. Every publication serves it's own purpose. We can only hope that pupose serves the readers, as well.

Radio Guide is not in competition with the other trade publications. I won't waste my time trying to outguess another publication's direction or content. This industry is too small and it's information needs too great, to let that happen. The end result, I think, would be redundancy. So, Radio Guide will stick to nuts and bolts. It's the reason for our success, and we will never disregard that.

As of this issue, we will be reaching all TV stations in the country. Take it easy now! It doesn't mean we're going to change our content one bit. We'll still be radio technology. It's just that many TV engineers have called to tell me that they would like to get their own copy of Radio Guide. Just because they deal with color bursts, rasters and back porches, doesn't mean they don't wish to know more about the real glamour industry. Hey - - we'll forgive them. There's 10,000 radio stations and only a couple of thousand TV stations, so who's big time? And besides, Radio doesn't have to worry about ratings (did I say that?) . . . editor

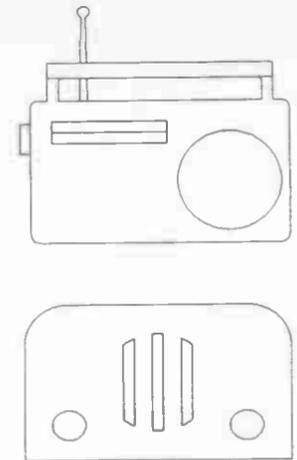
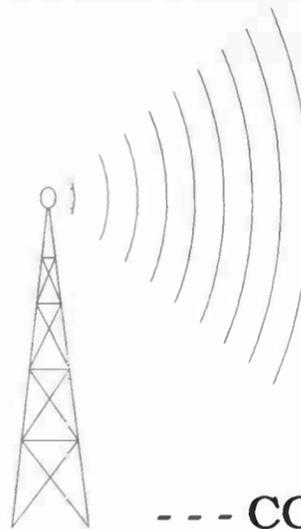
See The Used Equipment Guide Section

Please - Send Articles & Tips

Even though Radio Guide is in your mail each month, it doesn't mean we can let up. Please send those technical tips and articles in to the Guide. Don't think that it requires special talent to write for this publication. I think we can all agree that it's **what** you have to say, that's important. Radio Guide exists to solve problems. All of us are problem solvers - - it's our job. Tell us about one problem, and how you corrected it.

If you have a special hint or kink, test procedure, or anything of technical value, write it down and send it in. It will be published. Most of the articles are, by their nature, fairly brief; we need the participation of more engineers than you might think.

Starting with this issue, all of your articles and tech tips will be paid for. For an article of 2000 words, you will get \$30.00, for an article of 1000 words, you will get \$15.00, and for a tech tip, you will receive \$5.00. For odd length articles, we'll work something out.



--- CONTENTS ---

- Page 2 — Do You Have the Answers ?
Mistakes & Corrections
- Page 3 — Sans Mod Transformer
- Page 4 — Adjustable Power Supply
Emergency FM Antenna
- Page 6 — CD Skipping Cure
- Page 7 — "Pledge" Not to Clean Teflon-Coated
Solenoid Plungers
- Page 8 — Broadcast BBS Listings
- Page 8/9 — Care and Feeding of McMartin BTF-25M
- Page 10/11 — Tips From the Field
- Page 12/13 — Rip Off Calls
- Page 14 — Contract Engineers Listing
- Page 15 — Reader Service Card

Do You Have the Answers?

Bauer 607 1 kW FM Parasitics

Robin McDaniel, of KDEZ Radio in Newton Kansas, has a severe parasitic oscillation problem with their transmitter. The plate overloads and the choke in the B+ line burns up. If you have the solution or can offer assistance, please call Robin at (316) 283-5150.

Technics SP10 Turntable Speed Trouble

David C. Wright at WUNC Radio, Chapel Hill North Carolina, has a Technics SP10 MKIII with a speed problem. The MKIII is the model with variable speed, and that appears to be part of the problem. The unit will indicate 33 rpm, but actually be rotating at some random speed. The problem is intermittent and he hasn't been able to test it - - as usual, the problem disappears when he starts working it. The unit has also been blowing fuses.

Anyone having similar problems with this turntable, please call David at (919) 966-5454.

CCA FM 3000D Info Needed

John T. Winkvist at WFPS, Freeport Illinois, has need of detailed information and schematics on the operating panel of the transmitter, as well as the whole transmitter. It seems that there have been numerous modifications to the control panel. The overload system has been completely bypassed and everything seems to be running on only four relays instead of all of them. He wants to know what the panel is SUPPOSED to do and what the original wiring was like.

He says the mounting plate for the 8122 IPA looks as though it was home-brewed. Whoever made it, seemed to have forgotten that a tube needs air-flow for cooling. If anyone out there has an original box, take the time to shoot a couple of Polaroids of the IPA mounting plate area, and send them to John; he'd like to get it back to original specs.

John's address is WFPS, Engineering Dept., Box 701, Freeport IL, 61032. His phone number is (815) 235-7191. Call him early in the morning, as he is the overnight jock as well.

Mistakes and Corrections

Phone Coupler Queries

In the January-89 issue of Radio Guide, on page 3, there was an article and schematic for a remote telephone coupler box. A couple of people have written to inquire how relay K2 will drop out when you are through using the device.

The relay is held in by the phone line voltage, during use. When you disconnect the studio end of the phone line, the telco company provides a momentary battery disconnect at the coupler end of the line. This is a normal function of the telephone system, and allows the relay K2 to drop out.

FCC Rules and Regs Info - - Again

A number of people have called to inform me that the info regarding the loose-leaf style, FCC rules and regs in the January-89 issue of Radio Guide, had listed incorrect stock numbers for the publications. Here is the "right stuff."

Publication	Stock Number	Price
Volume I (parts 0,1,19)	004-000-00460-4	9.00
Volume II (parts 2,5,15,18)	004-000-00459-1	11.00
Volume III (parts 73 & 74)	004-000-00471-0	17.00
Volume IV (parts 90 & 94)	004-000-00474-4	11.00
Volume V (parts 21,22,23,25)	004-000-00462-1	10.00
Volume VI-B (parts 41,42,43)	004-000-00463-9	2.25
Volume VII (parts 61-69)	004-000-00462-1	10.00
Volume VIII (parts 76 & 78)	004-000-00473-6	4.00
Part 13	004-000-00458-2	1.00
Part 17	004-000-00461-2	1.50
Part 80	004-000-00475-2	6.00
Part 87	004-000-00466-3	3.25
Part 95	004-000-00467-1	2.00
Part 97	004-000-00468-0	3.00
Part 99	004-000-00469-8	1.25
Part 100	004-000-00470-1	1.00

Jim Nelson of Greenville North Carolina informed me of the stock numbers of the smaller, book style, bound volumes. Each 6 x 9 volume is bound and contains a range of FCC parts.

Volume	Stock Number	Price
Parts 0-19	869-001-00164-0	17.00
Parts 20-39	869-001-00165-8	21.00
Parts 40-69	869-004-00174-6	9.00
Parts 70-79	869-001-00176-4	17.00
Parts 80-100	869-004-00176-2	19.00

All of these FCC rules and regs may be ordered from the GPO in Washington, DC. The phone number is (202) 783-3238. If you have any questions regarding these publications, please give me a call at (507) 280-9668. I'll be glad to help . . . editor

AUDIO PROCESSING . . . hnaturally

A-MAZE (ā-māze)



HIGH DEFINITION IMPROVEMENT
For any existing processing chain plus . . . separation enhancement.

MIC-MAZE



HIGH DEFINITION MIC PROCESSING
Plus . . . program gain riding: STL, AM and SCA processing.

TRI-MAZE



FM STEREO, NRSC AM, OR TV
THE ULTIMATE IN FLEXIBILITY AND PERFORMANCE.



42 Elaine Street • R.R. 1 • Thompson, Connecticut 06277 • (203) 935-9066 • (203) 935-9242

Sans Mod Transformer

By Ron Schacht, CE, WNAK, Nanticoke PA

What to do when your one and only modulation transformer goes to ground, or worse, across the windings. First, generally, if it goes to ground, you can put it on a block of dry wood and get back on the air until a new transformer is obtained. Don't think this is a permanent cure, because usually whatever made it short to ground will ultimately cause a primary to secondary short.

Here is where old Heizing comes in. This modulation method has been used over the years in various communications equipment, such as aircraft, as the equipment is not as heavy without a modulation transformer. Here is how we can get back on the air without the old iron. You must remember that you won't modulate 100%, your positive modulation will be low and you may have a tad more distortion. But, you will be on the air, serving your listening public in radio land and making money to buy the new transformer.

First, as always, turn off the transmitter AC breaker and discharge all power supplies with "the stick". After the old transformer is disconnected, choose the plate lead from one of the modulator tubes (preferably the side with the best tube). Tie this line directly to the RF side of the modulation reactor. Normally the RF side of the choke goes to the PA stage plates. If you have no spare parts, leave it there.

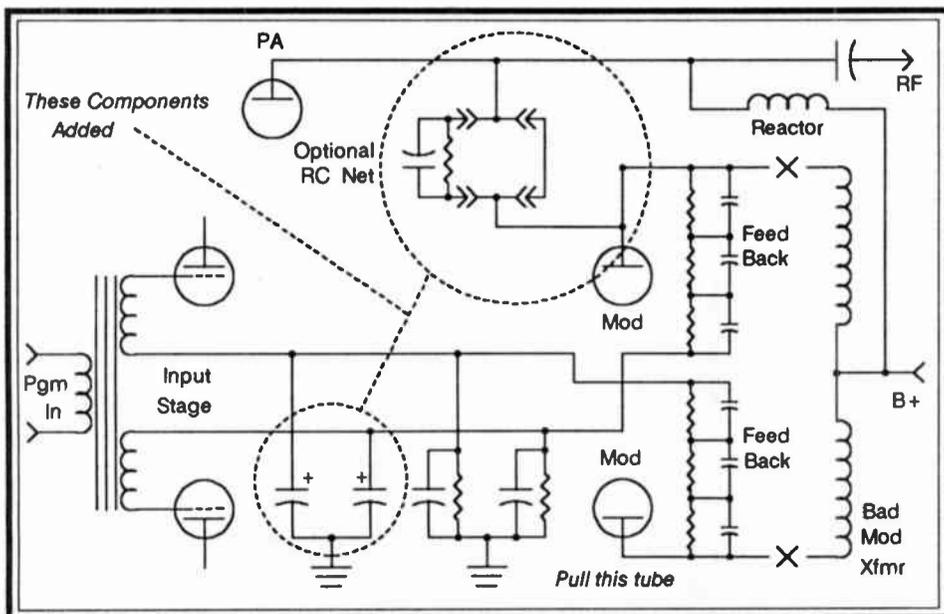
If you have some big resistors and capacitors, set up a parallel RC combination of a resistor and capacitor, in series with this line. The capacitor should be about 4uF rated at least at the transmitter plate supply. The resistor should drop about 500 Volts across it for 1 to 5 kW or about 1000 Volts for 10 kW and up, at a wattage rating according to its DC dissipation. For an average kilowatt, a 50 watt job will do. This will give a more symmetrical waveform, helping in the positive direction. But as I said, if you don't have the parts, don't waste time looking for them. Finally, pull the un-used modulator tube.

Locate the input transformer. In most transmitters, the feedback ladders return to the low side of the input transformer, in a 180 degree phase-shift. Generally, most transmitters will operate just fine with no DC returned to the fist audio grids. If this is the case with yours (RCA, ITA, Ratheon, Gates), take two trusty clip-leads and ground the two bottom ends of the input transformer secondaries. If you must preserve the DC on the input stage grids, ground the same points through a pair of 10uF 150V capacitors. This will eliminate the feedback but will let the DC through OK.

If you have a Raytheon, the feedback ladders can be completely disconnected, as they are on the second stage. Eliminating the DC and AC feedback will generally make the input stage operate closer to Class A, working on both sides of the AC cycle rather than either the positive or negative side, as it was used to.

Without audio applied, fire up the transmitter and check the idling plate current on the remaining modulator. Run it up to about one and one-half times its normal (again, we are trying to approach class A operation). Now, very carefully, bring up the audio. The transmitter will need much less audio with the feedback strapped out, so watch out. Basically, adjust the modulation so it "sounds OK", but usually 60-70% is good.

I hope this saves somebody some air time in an emergency as it has worked for me at numerous stations from 500 Watts to 25 kW.



From The ALLIED Technical Notebook

The Denon Cart Player® is the most popular machine in all of radio. Many ingenious methods have evolved to interface it with consoles of all types. Henry put them all in one box.

1. The Denon CD player uses 5 volt logic. Many consoles use 12 volts. Connecting the CD player directly to the console could cause lots of damage. LogiConverter solves this problem by isolating the console logic voltage from that of the Denon CD player. "LogiConverter provides double isolation. Opto-isolators on the inputs, and relays on the outputs."
2. Connecting the remote-control circuits of the Denon directly to the console will probably cause a ground loop, because the audio and control grounds will tie together in the console. LogiConverter prevents this from happening, to preserve S/N performance. "LogiConverter eliminates ground loops."
3. Many consoles use logic outputs for remote control. In many cases, a circuit goes "HI" (+12 v) for START. The Denon CD requires a logic LO. LogiConverter eliminates this problem.
4. Some consoles provide only a maintained closure for remote Start. The Denon CD needs a momentary. LogiConverter solves this problem, because it can convert maintained inputs to momentary outputs.
5. Many installations will require both Start and Stop from the console. Most consoles provide start-only outputs. LogiConverter will add the STOP function even if the console doesn't have it. "LogiConverter can be user programmed to add a STOP function even if the console has Start-only outputs."
6. Up to four CD players can be controlled by one LogiConverter, if Start-only operation is desired. (CD stops at end of track automatically.) If Start and Stop is desired, then two CD players can be controlled by one LogiConverter.



RICHMOND
CHICAGO

LA

ALLIED
Broadcast Equipment
— A HARRIS COMPANY

DALLAS
ATLANTA

1-800-622-0022

BEXT



HIGH PERFORMANCE AT AFFORDABLE PRICES

Front Panel Programmable PLL FM Exciters:

10 W, \$1,995	30W, \$3,495
20 W \$2,795	80W, \$4,495

FM Solid State Amplifiers:

100W, \$3,495	500W, \$5,995
250W, \$3,695	1000W, \$11,995

FM Tube Amplifiers:

800W, \$6,995	2000W, \$9,995
1500W, \$8,995	5000W, Call for price

Call BEXT for a Distributor Near You

BEXT INC.

739 Fifth Ave. Ste 7A
San Diego, CA 92101
Tel (619) 239-8462
Fax (619) 239-8474

THE "NFR" STORY

NFR is Noise Free Radio

Over the past year, I have been working on the simultaneous transmission of frequency and amplitude modulation on a standard AM Broadcast Band transmitter. This dual transmission is completely compatible with existing AM radios. And, when received on a new type of "Noise Free Radio," provides high fidelity, clean audio - typical of FM.

I have prepared a 26-page booklet describing these experiments, and suggesting ways of implementing this new medium in the near future.

To cover the cost of further experiments and demonstrations of NFR at conventions and meetings around the country, I am offering the booklet for sale at \$12.00. If, after reading it, you feel it was not worth the investment, just return it within 30 days for a \$10.00 refund. Thanks!

George W. Yazell PE (retired)

Make your check or money order payable to "Noise Free Radio" and mail to:

Noise Free Radio
P.O. Box 8086
Lakeland, FL 33802

Be sure to include your name and mailing address!

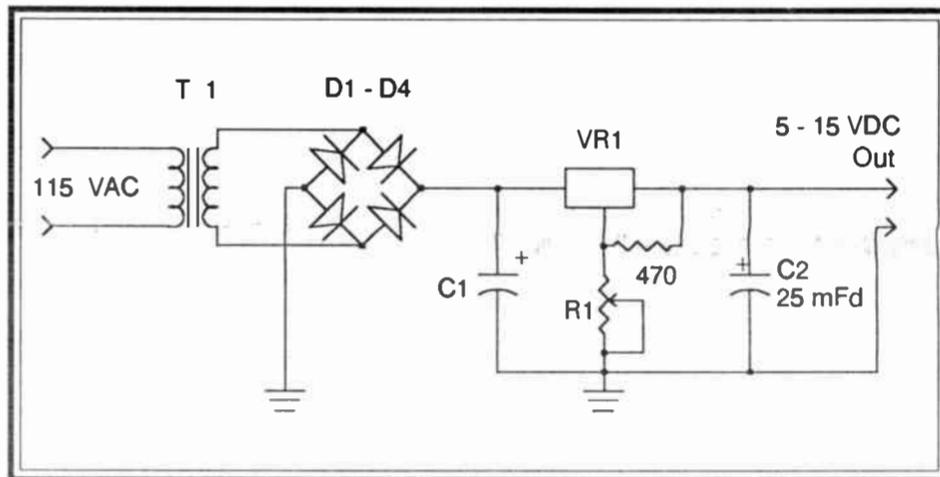
Adjustable Power Supply

*By Chuck Gennaro - WFHR
Wisconsin Rapids, Wisconsin*

An adjustable power supply is a handy item to have, whether for testing, construction or even keeping a piece of equipment running while its main supply is being repaired: As with many other things, a commercial unit can be expensive (translation: corporate bean-counter says no). Here's one that you can build from your junk-box.

T1 can be almost anything, within reason. 18 Volt transformers seem to be glutting the surplus market. A 35 Volt center-tap unit will work as well with a full-wave bridge rectifier; use whatever you have on hand. 1N4001, 1N4004 diodes, all work fine. One of those encapsulated, four-lead rectifier units is great. C1 and C2 are for filtering the DC output. Again, the exact values are not critical. 1000 uF TO 4000 uF for C1 will give satisfactory filtering. C2 should be around 25 uF. VR1 is a 7805 or other 3-lead IC voltage regulator. These little devils can supply up to 1 Amp, with proper heat-sink, and provide overload protection too. They will shut down and cool off, if overloaded. R1 is a 1k pot. It "fools" the regulator into providing up to 15 volts by shifting its ground reference.

This supply will produce regulated voltage from 5 to 15 Volts at up to 1 Amp., if the regulator is heat-sinked. More current can be supplied by adding a couple of series-pass transistors. 2N3055s will work as well as anything. Again, the type is not critical. Don't forget that the current output is also dependent on the capability of T1 and the rectifiers ratings.



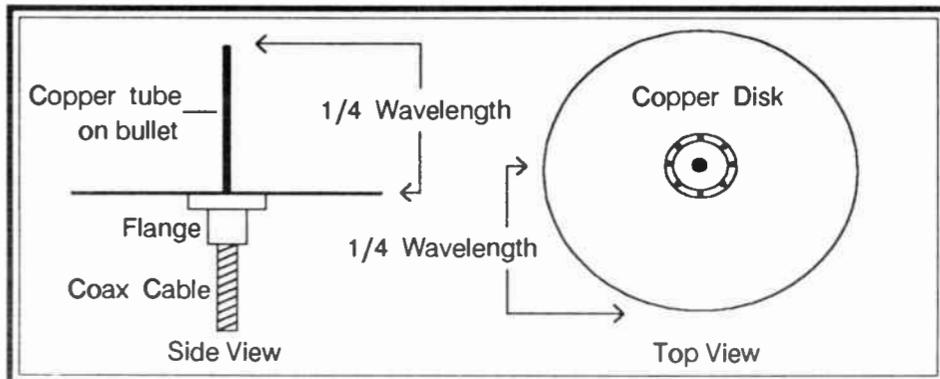
Emergency FM Antenna

*By David Stewart - KBNA
El Paso, Texas*

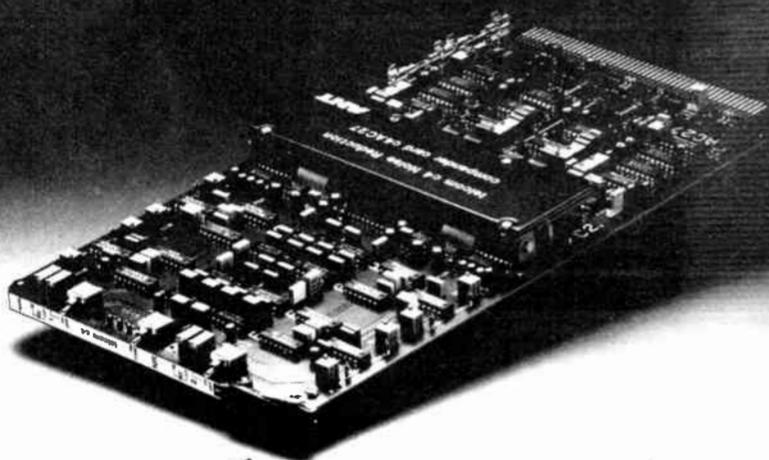
OK, you've smoked your FM antenna, perhaps melted the line down also. This stunt will help you to get back on the air quickly. It's real easy with rigid line because of the flange, but can also be done with flexible cable by adding a field flange.

As shown, the impedance will be about 40 ohms. If the ground plane consists of 1/4 wavelength rods oriented downward at 45 degrees, the radiation resistance will rise to 50 ohms.

Start with the transmitter power as low as possible, then raise power to some reasonable VSWR (1.5 or so). Your goal is to have something on the air.



SILENCE BY DESIGN.



telcom c4

AC27 Comander Card for the Sony BVH-2000 Series Video Tape Machines.

Features:

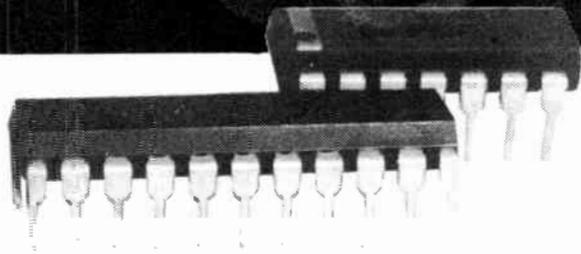
- A product of ANT Telecommunications, Inc.
- Plugs directly into the AU-27 slot of the BVH-2000/2500 Series 1-inch video tape recorders.

- Improves dynamic range and cross-talk performance offering a recording quality comparable to 16-bit digital.
- Corrects frequency response errors with head bump effects.
- Improves frequency response of the VTR.
- 24dB of noise reduction (telcom c4).
- NR system alignment not necessary.
- Automatically follows record/playback operation of the VTR.
- Remotely controllable.
- On/off switch located on the front.

Distributed by:

RAM BROADCAST SYSTEMS INC.
346 W. Colfax Street, Palatine, IL 60067 • (312) 358-3330 • FAX (312) 358-3577

These 2 new ICs and RAMKO RESEARCH have just changed the whole concept of Broadcast Audio!!



Introducing the incredible, new, xL SERIES of professional studio equipment!

U.S. INGENUITY

Dramatic developments in analog ICs have enabled us to develop an entirely new concept of high performance, professional studio equipment: rock solid construction; performance found only in units costing 2 to 3 times more; and pricing that will leave you simply incredulous.

FEWER PARTS/LOWER COSTS

The ICs above are two of the latest new releases from leading US manufacturers. A new quad op amp & VCA that deliver more performance and power for package size than anything previously available. Naturally, more circuitry in a single IC means: smaller product size; increased reliability; fewer manufacturing costs; and dramatically lower prices!

PERFORMANCE & VALUE

All of the xL series deliver performance to meet the requirements of even the most demanding professional. S/N ratios of -85dB to -90dB; distortion of 0.008% or less; and +25dBm out to mention a few of the more important spec's. Value? The xL series brings a new meaning to the word "VALUE" and does it in capitals! Prices unmatched by anything else in the industry-2 year warranties-performance on the cutting edge of technology-and construction that will stand up to whatever the situation demands.

NO RISK 2 WEEK TRIAL

You're the final judge and our trial period guarantees that you get exactly what you expect, each and every time. No and's, if's or but's. Simply put, if at any time within two weeks of receiving your order (custom equipment excluded) you are not completely satisfied or have just changed your mind, return it in like new condition. Upon verification of condition an immediate refund (less shipping expenses) will be issued, for payment in full or C.O.D.'s, or your account will be credited if purchased open account. **What more could anyone ask?** Pricing that will save you 20%-60% over any competitive product...Unsurpassed quality and performance...A no risk opportunity to prove to yourself that every claim we make is true. And, everything is backed by our 2 year warranty!

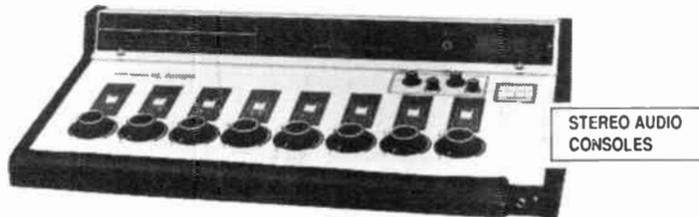
CALL TODAY

Call RAMKO RESEARCH today or, better yet, one of our master dealers listed in this ad.. You've nothing to lose except possibly some preconceived notions about how much quality really costs!

CALL TOLL FREE (800)678-1357

RAMKO MASTER DEALERS

BARRETT ASSOC. OCEANSIDE, CA (619) 433-5600	ELECTREX CO. MIAMI, FL (305) 651-5752	SOUTHERN COASTAL MARKETING PINEVILLE, NC (800) 438-6040
BROADCASTERS GENERAL STORE OCALA, FL (904) 622-9058	PROFESSIONAL AUDIO SUPPLY FORT WORTH, TX (800) 433-7668	
CAVECO EQUIPMENT CO. ONTARIO, CANADA (416) 438-6230	R.F. SPECIALTIES PITTSBURG, PA (412) 733-1994	



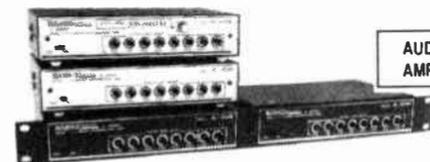
STEREO AUDIO
CONSOLES

4, 6 & 8 MIXER, SINGLE CHANNEL STEREO-\$1295 to \$2850!

The new xL series of broadcast consoles redefine the term "solid state" From the beautiful exterior finish of Carbide Black, muted grey's and special xL white polyurethanes and the exceptionally long life (5 million operations), silent illuminated push button switches, thru the rock solid 1/10" thick aluminum control surface to the individually housed (double RF shielded) plug-in modules and bussing system, it will be immediately evident that nothing has been skimped on to bring you both the finest sound possible and construction that far exceeds anything else available. In short, a console that will stand up to years of use (and/or abuse), deliver performance that can only be found in the highest caliber production consoles, is a snap to install and program, and a dream to operate.

HIGHLIGHTS: Each mixer is programmable for mic thru line level on input A and high level on input B. Identical PROG1 and PROG2 output channels each individually or simultaneously selectable at each mixer. Huge 4" multi-color, expanded scale solid state "VU" meters. Long life faders driving special ultra low distortion VCAs for precision tracking and noise free operation. Overhead protected audio switching ICs that cannot be driven into clipping. Internally located barrier strips for ease of installation and future changes. Double module shielding, extensive bypassing, instrumentation "STAR" ground system, and RF beads for high level RF immunity.*Four, six & eight mixers *Single & dual output versions *Mono mix outputs *15 inputs(4 mixer), 19 inputs(6 mixer), 23 inputs (8 mixer) *programmable mic/line inputs each mixer *mic inputs programmable for stereo or mono feed *programmable muting *External 20 watt stereo monitor amp *On air light's relays *Plug-in modules *Optional start/stop controls *

☐ xL41S (4 mixer, single channel) \$1295. xL42S (4 mixer dual channel) \$1450. xL61S (6 mixer, single channel) \$1795. xL62S (6 mixer, dual channel) \$1950. xL81S (8 mixer, single channel) \$2595. xL82S (8 mixer, dual channel) \$2850.



AUDIO DISTRIBUTION
AMPLIFIERS

DUAL CHANNEL, PRECISION AUDIO DA'S. Two different units providing dual 1x4 or single 1x8 and dual 1x8 or single 1x16 operation. Individual output level controls, XLR input connectors, rear panel switch for independent or single feed. Standard barrier strip or optional quick disconnect phone jack output connectors. Optional outputs metering/phones monitoring available. Balanced in & out. +25dBm out max; .008% dist; 10Hz to 100kHz resp.; -85dB s/n. xL4s/8m-table top & single or dual 1 3/4" rack mount. xL8S/16M- table top & single 1 3/4" rack.

☐ xL4S/8M-\$195. xL8S/16M-\$360. Call for option prices.



MINI AUDIO
MIXERS

6 MIXERS & UNMATCHED VERSATILITY. Three different models with: phones monitor; master level control; expansion port; metering; phantom power; mic & line inputs on each mixer & programmable voice gating. Dual XLR & phone jack connectors on each input and barrier strip outputs. Balanced in/out. 10Hz to 20kHz resp; .008% dist; -83dB line level & -72dB mic level s/n; +25dBm max out; UL listed supply. Table top or 1 3/4" rack. ☐ xL6M1 (no metering or phantom pwr.) - \$190. xL6M1A (metering & 21v phantom power) - \$225. xL6M1B (metering, phantom pwr. & voice gating) - \$295 ☐ PS-20 (UL listed power source powers one to five units) - \$25



TURNTABLE
PREAMPS

STEREO, DUAL MONO & COMBINED STEREO IN ONE PACKAGE!

Precision performance with dual mono, stereo & combined stereo balanced outputs. Resp., 20Hz to 20kHz, 0.25dB; dist., 0.008%; +25dBm max out into balanced 600 ohms: -84dBm s/n; 300mv headroom. Table top or single and dual rack mount. ☐ xLSCM2 - \$154



MIC & LINE AMPS-
PHANTOM POWER

DUAL CHANNEL WITH SWITCHABLE MIC/LINE INPUTS & 21V PHANTOM POWER. Balanced XLR inputs and balanced phone jack outputs. +25dBm max out into 600 ohms; resp., 10Hz to 20kHz, -1dB; 0.008% dist.; 72dB gain mic & 22 dB gain line; -71 dB s/nmic & -84dB s/n line. Front panel level controls. . Table top or one thru four 1 3/4" rack mount. ☐ xLM2L2 - \$129. PS-20 (UL listed power source powers 1 to 10 units) - \$25

* THIS IS ONLY A PARTIAL LIST OF OVER 80 DIFFERENT PRODUCTS MANUFACTURED FOR THE BROADCAST INDUSTRY.
☐ AUDIO ROUTERS SWITCHERS starting at \$1273 ☐ STUDIO POWER AMPLIFIERS from \$99 ☐ MODULAR AUDIO DA'S from \$900 ☐ SOLID STATE METERS ☐ AUDIO MATCHING AMPLIFIERS \$115 to \$174 ☐ MIXERS (studio & portable); COMPRESSOR/LIMITERS; and the list goes on. Call for our new catalog or specific specifications sheets.

RAMKO RESEARCH

3501-4 SUNRISE BLVD.
RANCHO CORDOVA, CA 95742
(916) 635-3600

CD Skipping Cure

**By Jerry Mathis - WSCI/WKKG
Columbus, Ohio**

Many radio stations are using consumer-type DC players in their studios and control rooms. They'll work fine for awhile, then they start having problems. One of the main problems I have encountered is that the music will "skip", much like a turntable stylus jumping one or more grooves of a record. I have found that cleaning the laser pickup lens will solve the problem, at least temporarily (until the lens gets dirty again).

To clean the lens, remove the player from the studio and take it to your bench. Plug the unit in, and open the CD drawer. Be careful so you don't damage the drawer while working on the machine. Unplug the unit and remove the cover. There are usually four or six screws on the sides (possibly one or more in the rear).

After removing the cover, you should be able to see the laser pickup assembly under, and about in the middle of, the drawer mechanism. On top of the assembly you should see a small (about 1/8" dia.) lens. You'll probably find it somewhat clouded by dirt and dust.

The lens and its mounting are rather fragile, so we want to be careful. Take a cotton swab and pull some cotton loose on the end, so it makes a rather fine and delicate brush. Use this to lightly brush the debris from the lens. You can gently blow on the lens as you clean it to be sure all particles are removed, and you don't leave any strands from the swab. Don't use any chemicals, not even alcohol or disc cleaner - - just the light cotton hairs from the swab.

Re-assemble the unit, plug it in, and retract the CD drawer. There's a good chance the machine will play perfectly. If it still skips, then it's time for a trip to the shop.

Don't overlook the possibility that you have some damaged CD discs that are causing your problem. CDs are touted as being practically indestructible (ha!). If you have a disc that always skips at one spot, try the disc on another machine (preferably one of the same model). If it skips in both machines, you may have a bad disc. If it skips just in the one machine, try the cleaning procedure described above.

Incidentally, you might want to check before you open the machine to see if doing so will void the warranty. If the unit is practically new, this might be a problem. If the machine is six months old, and your nearest repair depot is in South Podunk, you're probably not going to send it back to them anyway.

If anyone out there has some tips on troubleshooting and aligning CD player electronics, I'd like to see them. The consumer units almost never come with a schematic, and certainly not a service manual. Is there some basic troubleshooting that could be done with a DVM, 'scope, and maybe a frequency counter?

If anyone else has CD tips send them in. There's a lot of consumer style CD players out there - - are there a lot of problems? . . . editor

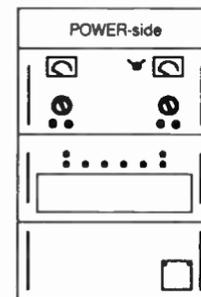
RCA BTF-5/10/20E TRANSMITTERS

We're still looking for articles, tips and information regarding this series of transmitters. There are still quite a few of these transmitters out there, providing reasonable service. In many cases it's taken a lot of work and ingenuity to keep them running, and to find parts (if any). Send those articles and tips to:

Radio Guide
511 18th St. SE
Rochester, MN 55904
(507) 280-9668

POWER - side™

The solution to many of AM radio's most serious technical problems



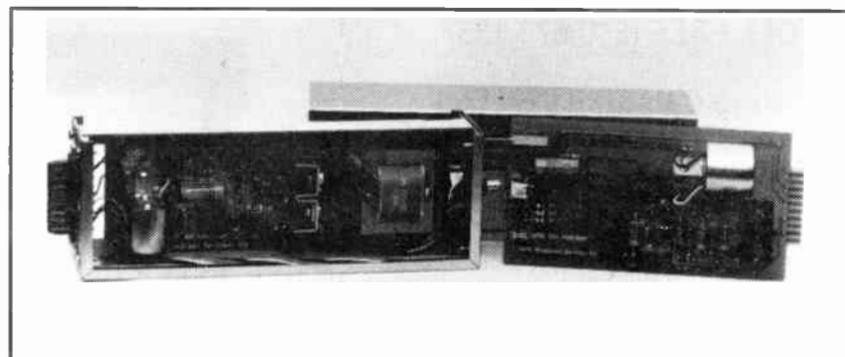
From the developers of the
AM STEREO system
"that isn't afraid of the dark"



425 Merrick Avenue
Westbury, NY 11590
(516) 222-2221

Don't Retire that Old Executive ... Retrofit!

With Broadcast Devices' field proven 10-minute retrofits you can make your old sturdy Harris Executive console perform like today's top of the line. These affordable retrofit electronics are modern plug-in replacements for the old technology mic preamps and line amps. They also will retrofit other Harris consoles including the Diplomat, President and Ambassador series. It makes good sense to retrofit -- you save thousands over the purchase of a new console and studio redesign, improve your sound and eliminate the maintenance headaches that cause embarrassing downtime. If you ever plan to sell your console, our retrofits can dramatically increase its resale value. Contact Broadcast Devices or your local broadcast distributor today for more details.



Suggested list prices: Line amp: \$360
Mic Preamp: \$165

Coming soon: Retrofit modules for the Harris Stereo Statesman, Gateway II and Dualux II series consoles!

Affordable solutions for the broadcaster ...
5 Crestview Avenue Peekskill, NY 10566 (914) 737-5032

bdi Broadcast Devices, Inc.

"Pledge" Not to Clean Teflon-Coated Solenoid Plungers

By **Time McCartney - KBSU**
Boise, Idaho

A cart machine is supposed to fire every time. So, when it doesn't, the culprit frequently is a solenoid which fails to properly pull in the pinch roller.

A sluggish solenoid is usually improved by the dampening adjustment at the back of the can, since the speed of solenoid operation is directly proportional to the speed at which air is allowed to move through the small hole in the solenoid seat.

What to do if this adjustment fails to improve the sluggishness?

The ITC Customer Service Department maintains that its Teflon-coated plungers normally offer no resistance to the dampening action and, therefore, are not likely to be the source of the problem. However, if the plunger Teflon coating has worn or has been scratched, it is possible that dirt and dust have accumulated to offer resistance. It's time for a new solenoid. A plunger cannot be purchased alone, since the entire assembly is matched by the manufacturer.

ITC recommends limited solenoid cleaning. The screw and spring on the back of the can may be removed and blown out with an air hose. As for the plunger, it can be removed and wiped with a clean towel. Other efforts at plunger cleaning assure some trouble ahead.

Short-term hope does exist, while a replacement part is on order. The use of the furniture wax "Pledge" can sufficiently lubricate the plunger to restore the needed response. Using cotton swabs or a clean cloth, apply the wax to the exposed portion of the plunger.

ITC warns, however, that such lubricants will, in time, collect dust and re-introduce similar problems.

At KBSU, we tried the "Pledge" approach to extend solenoid life, with some success. After about eight months, another application was needed and, in a sense, our ITC cart solenoid plungers are now Johnson Wax junkies - - "hooked" for life.

These findings suggest that solenoid life might be extended a year or two with regular "Pledge" applications. But, there will undoubtedly be some on-air starting failures unless this maintenance technique is regularly followed.

We are glad not to have committed the cardinal sin of plunger lubrication errors, however. That would be an application of graphite - - its abrasiveness can quickly chew right through the Teflon coating.

Teflon Presidents may come and go, but Teflon solenoid plungers are here to stay. In theory, at least, nothing sticks to Teflon and trouble is avoided. But, then there's the real world . . .

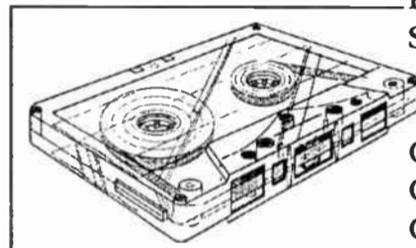
For Your Information . . .

A continuing feature of the Radio Guide, is the reader-service "coupon" located on page 15. Fill in all the information asked for, and circle any advertiser's number from which you wish to obtain more information. Along with the "coupon", feel free to send a couple of technical tips you may have lying around. We can use them!

You may also want to jot down your name and address if your not getting the Radio Guide at the location you wish.

As usual, if you have any questions or comments, please call me at (507) 280-8668 . . . editor.

Blank Cassettes... Perfect for Demo Spots



BASF Pure Chrome
Shape Precision see-thru shell
in quantities of:

	50	100
C-5's	\$.53 ea.	\$.46 ea.
C-10's	\$.58 ea.	\$.50 ea.
C-15's	\$.63 ea.	\$.54 ea.

Custom lengths are also available

BASF LHD Normal Bias
Michelex German made shells

in quantities of:

	50	100
C-5's	\$.49 ea.	\$.42 ea.
C-10's	\$.53 ea.	\$.46 ea.
C-15's	\$.58 ea.	\$.50 ea.



PHONE: (507) 288-7711

FAX: (507) 288-4531

Tom Jones Recording Studios
220 South Broadway
Rochester, Minnesota 55904

SERIES VI — A SOUND DECISION!



SYSTEM 20-VI

SERIES VI Broadcast Audio consoles are completely modular with a new low profile appearance and new features. Mainframe sizes of 8, 12, 16, 20, and 24 mixers are available. An LED clock/timer, peak level indicators, headphone EQ, monitor "dim", and 3 stereo, plus 1 mono mixing bus, are standard (except for the 8 mixer model). A 5-frequency EQ mixer and equalized Aux Send module are optional. All mixers have mic/line inputs. Double-sided ground plane motherboards are used for RFI rejection, and lowest possible noise and crosstalk. There are no VCA's or ribbon cable audio conductors.

These great sounding consoles are ideal for use with CD's, which require a wider audio bandwidth, to fully exploit their spectacular transient response. Call or write for our new brochure. **SERIES VI - A SOUND DECISION!**

**BROADCAST
AUDIO CORPORATION**

11306 SUNCO DRIVE
RANCHO CORDOVA, CA 95742
(916) 635-1048

Broadcast Computer Bulletin Boards

Broadcast Computer Database
7 days a week, 24 hours a day
All Baud rates (8 data, no parity, 1 stop)
Specializes in on-line engineering programs
David Armstrong (sysop)
(713) 937-9097

Network Communication System Broadcast BBS
300/1200 Baud rate
Specializes in technical tips and schematic graphics
(601) 373-0160

Flamethrower Broadcast Resource Center BBS
300 - 2400 Baud rate (8 data, no parity, 1 stop)
7 days a week, 24 hours per day
60 megs on-line, broadcast engineering and ham radio
(804) 730-1291

Allied Broadcast BBS
300 - 1200 Baud (8 data, no parity, 1 stop)
Over 220 Basic programs and ASCII files
(317) 935-0531

Care and Feeding of McMartin BF-25M Transmitter

By Bruce Anderson - KIQX
Durango, Colorado

Once you learn the quirks of any transmitter, you can either modify it or learn to live with it. The McMartin BF-25M twenty-five kilowatt FM transmitter is no exception.

We've had one since the station went on the air in 1981. With a couple of quirks ironed out, we're living with it quite well, thank you.

The first major modification was a factory bulletin changing the final from the original tube to a 3CX-15000A7. After this modification, the BF-25M was very stable and quite tunable.

Our line power is at the end of a 3½ mile haul up the mountain-side. Although we have three-phase closed delta service, the line is susceptible to glitches - especially if something zaps in Tacoma Washington or Orange California. Add to that our abundance of electrical storms, and we have had over-loads and breakers tripping all the time. The solution was essentially three-fold. First, we super-grounded everything, and not just to the electrical service. Three-inch copper strap was run from a bond on each equipment rack and each cabinet of the transmitter and high voltage power supply to an outside buried grid around the building. The tower was also bonded to this grid.

Great Grounding Effort

B.G. (before grounding), we took many strikes, a couple of which wiped out various components in the building, including the remote control. In fact, you could follow the trail of destruction around the cabinets, from the power supply through a contactor and right to one of the blower motors in the PA - which from that point on insisted on running backwards (the starting winding got zapped). Since the great grounding effort, we've been hit by lightning quite a few times, and there's been no damage to the transmitter. In fact, we've hardly gone off the air due to the elements.

Second, we protected the line coming in with a gob of MOVs. and rectifier stacks have held together since then. Third, we added considerable regulation to the low voltage power supply. Until then, we were popping heads off transistors right and left, particularly Q1 through Q6 in the over-load protection assembly and Q2 and Q4 in the control ladder. Since the regulation, nothing has gone South.

We added a Bird Wattmeter to the output of the driver stage, which gives us a quick glance at what that section is feeding to the PA. It also lets us know precisely what's going out to the antenna (or coming back) if we ever experience a PA failure and run the driver straight into the harmonic filter, which the BF-25M is capable of doing with some re-plumbing.

Microphonics a problem

We drive the final with about 1200 watts, which lets the PA coast. All three of our tubes show absolutely no signs of dropping off, after about two and a half years of continuous service.

It is recommended that you remove the exciter from the driver/ IPA cabinet because of microphonics in the unit and its proximity to the blower. It's so sensitive, though, that we have it shock mounted in a rack away from the entire transmitter box. Before shock-mounting, it would pick up blower rumble through the concrete floor and metal rack!

We've moved some things around in the PA cabinet, mostly to keep sensitive components away from heat. The rheostats for the filaments are too close to the overload protection board for my comfort, especially when the hinged door they're on is closed. Moving them a couple of feet down the outside of the box might mess up McMartin's pretty contact-paper/wood-grain exterior, but it sure keeps things cooler.



THINK MLW-1

- Three stereo inputs, one stereo output
- Automatic switch to secondary or tertiary inputs on primary *loss of channel*
- Automatic switch to secondary or tertiary inputs on primary *loss of audio*
- Automatic loss of channel correction
- Automatic audio polarity correction
- User programmed sequence and time delays
- On-line audio monitoring and switching
- Microprocessor based
- Audio error alarms and level matching

**AND MORE... CALL OR WRITE
FOR COMPLETE DETAILS**

**TITUS
TECHNOLOGICAL
LABORATORIES**

**1134 Neipsic Rd., Glastonbury, CT 06033
(203) 633-5472**

McMartin BTF-25 (continued)

I've considered installing a box fan to further circulate the air in that part of the cabinet, but it doesn't appear necessary at this time. Also, we felt no need for adjustment of the IPA filament voltage, so we un-ganged that rheostat from the driver filament rheostat and put a fixed twenty-five watt resistor in the circuit.

In the same area, the four bleeder resistors (R47 through R50) in series/parallel are subject to considerable stress and invariably fail within a few days of a new PA final installation, so we keep a set of spares.

So often transmitter manufacturers (and I include virtually all of them) have designed units for operation at or near sea level. A scant few have taken into consideration high altitude cooling in their original designs, and a few more have high-altitude kits available. Most of the rigs around here operate at eight thousand to ten thousand feet elevation, where the air is a fraction of what it is at sea level.

Whimpy Blowers

The poor little Centrimax blowers are kind of whimpy for moving the volume of air it takes to cool things at this altitude. The one in the IPA/driver section has a tough time keeping these tubes cool, but it manages. The two blowers below the PA cavity simply aren't enough, especially with the additional friction caused by a heavy-duty filtering system on the back of the transmitter. I'd like to see about a three-horsepower blower in the final, but we've added a one-horsepower in-line Dayton shop blower to the output duct. That makes for a much cooler operation.

The BF-25M is obviously designed to have the stack heat vented either straight up or toward the rear of the unit and out of the building. Ours goes back, which takes the duct-work of both cabinets right over their respective air intakes by about 6 feet. The radiated heat from these big square metal pipes goes right back into the intakes. So we wrapped the ducts with heavy insulation, and ended up reducing both stack temperature 5 to 10 degrees.

Electronic equipment doesn't like four basic things, I've learned: water, heat, bugs, and dust. Hopefully, you don't submerge your BF-25M and we've just discussed decreasing the heat factor. Bugs and other critters can be a royal pain if they're not controlled. Don't give them a reason to be there, and they'll go elsewhere. In other words, keep the munchies wrapped air tight, or out of the building entirely, and the critters will tend to forage somewhere else. But not letting them in, in the first place, is wise, and easily accomplished if you have control over even finer particles, such as dust.

We keep a positive pressure inside the building and (except when the door is open) the only way something can enter is through the filters. Regular furnace and air-conditioning filters suffice for the building, and they're relatively cheap to replace when they get dirty. But we have a couple of Space-Gard (tm) Model 2200 air cleaners attached to the back doors of the transmitter. Regular inspection every 3 to 6 months reveals that absolutely no dust has entered the RF cavities of our BF-25M, and the only dust in the rest of the rig has crept in from cracks in the cabinetry.

Keep Spare Parts Handy

We try to keep spare parts around, including plenty of Teflon rods for tuning controls (which tend to get brittle after a while and break) and sheet-stock which is used in the PA tube socket as a plate blocking capacitor. One early modification, which was done to our BF-25M, was to replace all the bulb indicators with LEDs. Another change was to re-route the tuning and loading controls for the IPA and driver sections so they come straight out of the cavities and through the front wall. This alleviated bends in the controls and gave a more positive feel to the functions. We ended up drilling a couple of additional holes in the front plates to do this, and ended up with an extra hole (the former IPA grid tuning control) which we slapped a dummy knob on and labeled FIDELITY CONTROL. It keeps the competition wondering! The chains that drive the driver and PA, tuning and loading mechanisms, stretch over time, and should be replaced (lubrication helps very little).

This is what's been cooking at CRL!

Just out of the oven are our two latest AM limiters, the PMC-450 and the SMP-950. We have upgraded the performance of our limiters by adding a tri-band limiter section to them. The result is unequalled vocal clarity and punch, either in mono or C-Quam[®] AM stereo. Converting to the NRSC standard? Both of these NRSC compliant units are easy and cost effective ways to convert. Plus in many cases our NRSC compliant processing will improve your coverage area. Want to try one out? Our two week trial program is available. Call us for details.



SEE US AT BOOTH 1009 NAB

C-Quam[®] is a Registered Trademark of Motorola



CRL Systems
2522 West Geneva Drive
Tempe, Arizona 85282 U.S.A.
(800) 535-7648 (602) 438-0888
TELEX: 350464

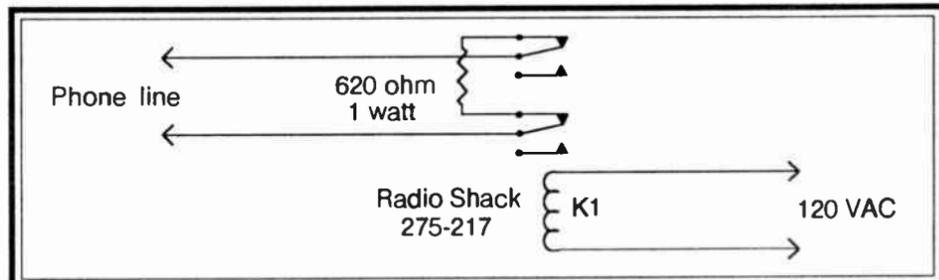
Tips From The Field

Technical Tips From Around the Country

Power Indication Tip

By Bill Rett - KWTR
Lakeport, California

If you have a dial-up telephone line at your transmitter, here is a method to indicate if there is primary power at the transmitter.



When you call the transmitter site telephone, if there is no power, you will get a busy signal. When the power fails, the relay de-energizes and takes the line off-hook.

AM ATU Tuning Tip

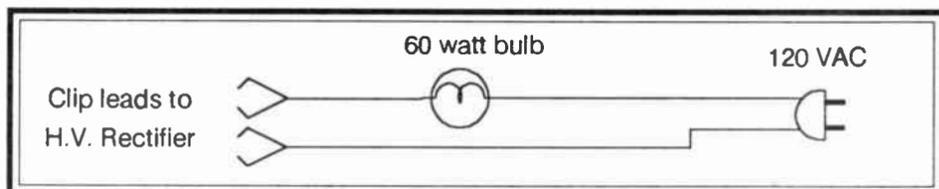
By Donald J. Larsen
Idaho Falls, Idaho

Mount a 25 or 40 Watt light bulb inside the antenna tuning unit cabinet. Preferably, it should burn twenty-four hours a day. If necessary, put it across the tower lighting circuit so that, at least, it will burn during the nighttime hours. The small amount of heat generated by the bulb will keep the moisture out of the cabinet. I have had moisture in the base meters freeze in the winter time without the bulb, but the problem was solved after the installation of the bulb. Also, this seems to minimize corrosion in salt or poor atmospheres.

HV Rectifier Tip

By Michael F. Ring - WTNV
Watertown, New York

Here is a cheap, fast and accurate solid state high voltage rectifier tester:



1. Disconnect leads to HV rectifier stack.
2. Connect UNPLUGGED tester across one section of stack.
3. Plug in tester.
4. If bulb lights full brightness, diode is shorted (most likely).

If bulb does not light, tester not connected properly or diode open (unlikely failure mode).

If bulb lights to around 1/2 brightness, diode is likely OK.

This circuit performs a reasonable voltage/current test (170V p-p @ 1/2 Amp) and will catch faults missed by VOMs or other low-power methods. Just remember, the leads have 120VAC on them - - treat them with respect. Also, if your eyes are sensitive, you may want some sun-glasses.

Please-We Need Your Help!

If you have any short tech-tips, send them in or better still, call me at (507) 280-9668 and we'll talk about them. Remember, it doesn't do anyone any good if you keep that information to yourself. Don't assume that everyone knows about your special technical tip. Send them in - - they'll be printed in the next issue.

Commercial Radio Company

Duttonsville School Drive
Cavendish, VT 05142

(802) 226-7582

FAX: (802) 226-7738

Transmitter Parts For:



RCA
Gates
Collins



Mica Transmitting Capacitors: Sangamo, CD, Sprague, Aerovox, Acushnet types: CM-15, CM-20, CM-25, CM-30, HT, HK, AK, F1, F2, F3, 30B, E, 291, 292, 293, 294 and G5.

Fixed and Variable Vacuum Capacitors: Jennings, Dolinko & Wilkins. Mounting brackets and flanges. Vacuum relays.

Oil Filled Filter Capacitors: Plastic Capacitor Corp., 600 to 40 kV, 1 mFd to 30 mFd with special mounting brackets.

Ceramic RF Capacitors: Centralab, Jennings, Sprague, high-energy epoxy types to 40 kV.

Variable Transmitting Capacitors: E.F. Johnson Co., Cardwell Condenser Co.: insulated shaft couplings as used in phasors, variable transmitting capacitors.

Weschler-Westinghouse: RF Ammeters, 0-0.5 Amps thru 0-50 Amps, internal and external thermocouples, expanded and linear or square-law scales. Sizes are 3 & 4 inch, round and square. Special meters and repairs are available.

Radio Corporation of America - a division of Commercial Radio Company: RCA transmitter, phasor and tuning parts.

ECONCO



WE REBUILD POWER TUBES

ECONCO
1318 COMMERCE AVENUE
WOODLAND, CA 95695
TELEPHONE 916-662-7553

OUTSIDE CA 800-532-6626 EXT. 300
FROM CANADA 800-848-8841
TELEX 176756
FAX 916-666-7760

Listed below are a few examples from our price list.

3CX2500F3	.....	\$410.00
3CX3000A7	.....	\$495.00
3CX3000F7	.....	\$520.00
4CX5000A	.....	\$790.00
4CX15,000A	.....	\$1,090.00
4CX3000A	.....	\$695.00

We buy duds. Call for a quote.

Tips From The Field

Technical Tips From Around the Country

Moth Balls or Mice

By William H. Payne - KTFX
Tulsa, Oklahoma

Buy yourself a couple of boxes of moth balls and spread them around the interior perimeter of your transmitter building. Mice don't like them or the smell and never will seek your building as a place of refuge from the cold.

As all of us know, mice can cause us down-time when they get fried! Many times we don't discover the cause until we un-cover their tiny carcasses.

A simple sprinkling of moth balls will do the trick. About every 30-40 days, you'll have to spread them again, as they dissolve with time.

Continental Exciter Tip

By Greg Hahn - WRKA
Louisville, Kentucky

When my Continental 802 Exciter lost all of its RF output, the front panel metering led me to believe that I might have a bad RF output transistor.

The meter reading labeled "I", had more than doubled its normal reading. I assumed this to be a reading of final collector current, and when I shorted the base/emitter junction of the final and the "I" reading didn't go down, I replaced the transistor, even though it checked good with my ohmmeter. I thought it must have been breaking down under load.

When that didn't fix my problem, I discovered that the "I" meter on an 802 exciter reads the current to BOTH the final and driver transistors, and it was the driver that had shorted.

A new driver transistor from my recommended spares kit fixed the problem. My unit was under warranty and Continental sent me a new spare for free.

Another note worth remembering is that "solder wick" is really indispensable in removing RF-38 style and other similar RF transistors.

Harris TX Tip

By Larry Schropp - Schropp Services
Charlotte, North Carolina
704-536-9812

Here's a tech tip that may be of interest to some stations still running the old Gates (Harris) BC-1T AM transmitter. If you have problems with the intermittent loss of RF drive causing overloads or tube damage to the 833s (if the overloads aren't set right), the problem could be a dirty crystal switch in the oscillator section.

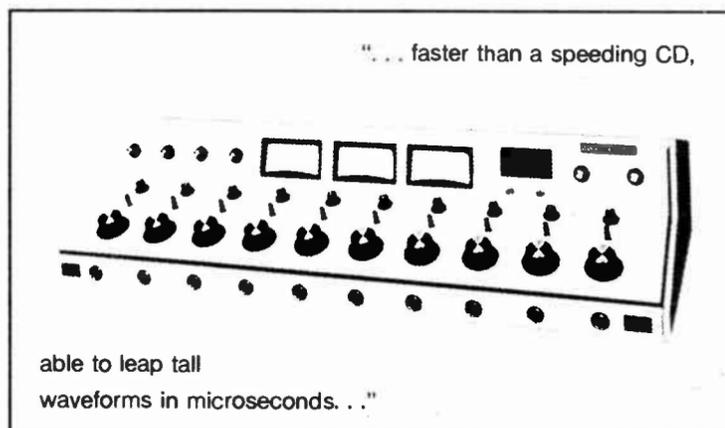
RCA BTF-20E Transmitter Tip

From Rich Egan - WIZM
LaCrosse, Wisconsin

Rich called in with this tip a few days ago. He has an RCA BTF-20E transmitter and, from time to time, he found that the plate overload would kick out for no apparent reason.

After inspection and troubleshooting, he found that the shunt resistor across the PA overload relay had opened up. With the resistor "gone", the relay became more sensitive and would trip out on current levels that normally would not have affected it. He replaced the shunt resistor, and operation was back to normal.

UPGRADE YOUR AUTOGRAM!



A NEW series of Turbo-Modules from Henry Engineering will transform your trusty Autogram into a high-performance console with *spectacular* sonic results! Why spend \$20K for a new board? For about **one-tenth** of that, you can have the industry's **best sounding console**. Installation takes just 60 minutes . . . and results are guaranteed! An Autogram IC-10 that's been turbocharged with our direct-coupled modules will have frequency response of 1Hz to 40kHz (not a misprint), 85db S/N, and .02% THD.

Order a complete IC-10 upgrade kit and receive a Mic Preamp **FREE!**
For info, call . . .

HENRY ENGINEERING
(818) 355-3656

We Build Solutions



Nobody does it better.

The Telos 100 and Telos 10 digital hybrids are the acknowledged leaders in providing the highest quality telephone talk. And now we introduce the most complete family of interfaces and accessories. More than ever, Telos hybrids can provide you with the performance and features required by your installation. Isn't it time for you to experience the pleasure of great phones?

Call Toll Free 800-732-7665



**BRADLEY
BROADCAST
SALES**

Where Service and Engineering Make the Difference

8101 Cessna Avenue • Gaithersburg, Maryland 20879-4177
MD & DC: 301-948-0650 • FAX: 301-330-7198

Rip Off Calls

By David H. Solinske - WWRM
St. Petersburg, Florida

My first experience with telephone con-artists preying on radio stations and engineers, occurred in 1977, when they were still civil and acted like sales agents. I was low on fluorescent tubes, when the voice on the other end of the phone offered a Christmas gift with every order. Just one of the early inexpensive Timex LED watches. It was nice, I thought, to be appreciated by someone in the world. After all, if it weren't for sales people, the engineer would probably be the least liked person in a radio station. The fellow said his company usually supplied our station (and buying from him would save me a trip around the city). Our relationship was pleasant in that transaction, and I never needed to order any more before I left that station, although he called frequently, trying to drum up more business.

Just a couple of years later, in Philadelphia, I had another call from a high pressure phone type from California. It was nearing the end of the year and his company had to "unload audio cassettes before the California inventory tax hit them." Difficult to get him to accept a no, but indeed a no he finally had to realize.

The heat must have been turned up in the L.A. boiler rooms in the following eighteen months. New on the job in Chicago, I received a call: "Dave, we're ready to ship those cassettes to you; I just need the shipping address." I wondered what cassettes he was referring to. "Your last engineer ordered a thousand of them, just before he left," he said. When I informed him that I didn't need them, didn't want them, and knew nothing of them, he steadfastly refused to cancel the "order", and insisted he was going to ship them. I asked him the purchase order number - - he froze. I knew I had him. It was my turn to take this weasel to task and turn the pressure on him.

No Purchase Order

I coolly pointed out the shipping address in on the purchase order. He admitted that he hadn't been issued one and that the order was verbal. When I coolly informed him that no order from my company was valid without a purchase order, he became belligerent. He WAS Going to ship! I realized I was being a bit too generous with my time and the fun of the game was wearing thin. I simply reiterated that no order was valid without a purchase order, and that if he shipped, it would be considered as unsolicited merchandise and disposed of as such. I hung up - - he called back. I hung up again - - again he called back. The third time he stayed away.

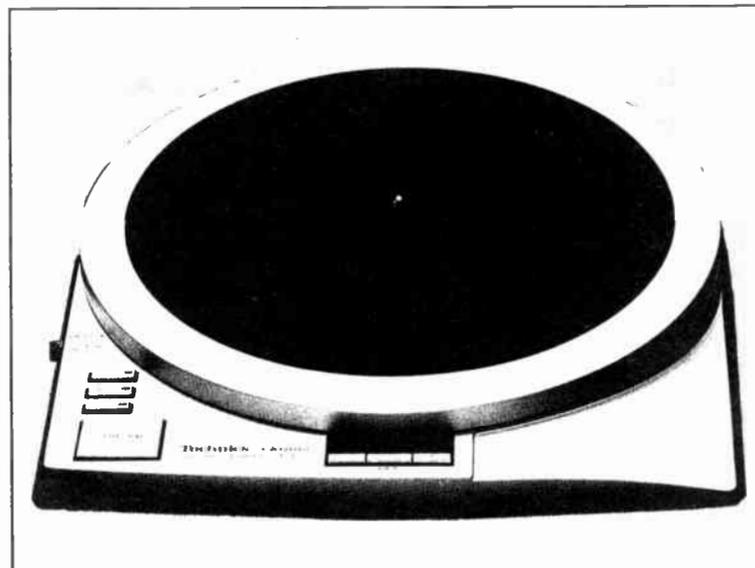
That call alerted me to the problem of these "sales persons." Every couple of months, I received a call about "white box cassette tapes," allegedly manufactured by BASF, that had to be disposed of for California inventory tax purposes or some other high pressure reason. No matter where I am, the calls seem to keep coming, much like the fraudulent invoices some boiler operations send to businesses for services or items not even rendered. I usually dispose of these calls quickly and quietly. No need, I felt, to bother anyone with the details of another crack solicitor. Now I realize that with the turnover in broadcast personnel, radio stations seem to be a prime target for these scams.

My assistant and I both left our jobs recently, and he went on to his first real chief engineer job. He called and said that he was going crazy with an order for cassettes his predecessor had placed, because he couldn't find the order or a place in the budget for them. He wasn't sure how to handle it with the GM. Upon hearing a few more details, I told him what to do after explaining the history of the pressure phone types.

At my new job, I had a call from a lighting salesman. It was a thrill hearing from one again, after all these years. He was telling me how my predecessor always purchased the fluorescent tubes from him and how he had a standing order and wanted to check the shipping address ... and on ... and on. "Very interesting," I told him. "How's that," he asked. "Well," I replied, "seems for the past fifteen years the station has been in an office complex that is in charge of, and replaces the fluorescent tubes." CLICK - - no explanation or apology from the jerk. Just a click.

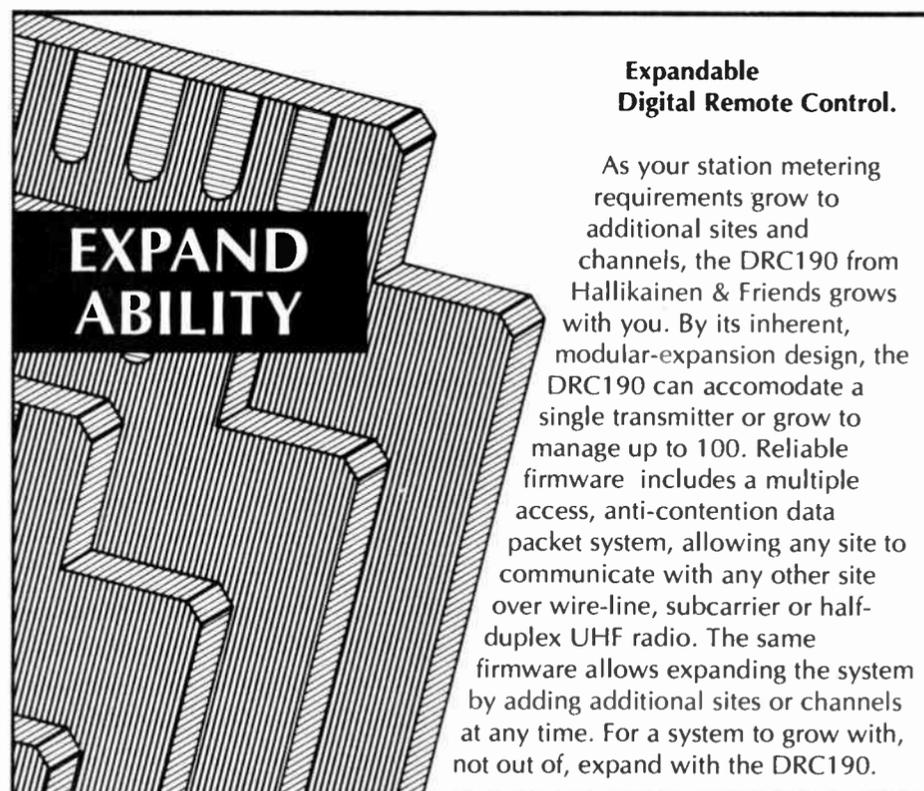
Northeast Broadcast Labs

P.O. Box 1179
South Glens Falls, NY 12803
(518) 793-2181



\$595

Technics SP-15
Direct Drive Turntable
0.4 Second Instant Start
Three Speeds



EXPAND ABILITY

Expandable Digital Remote Control.

As your station metering requirements grow to additional sites and channels, the DRC190 from Hallikainen & Friends grows with you. By its inherent, modular-expansion design, the DRC190 can accommodate a single transmitter or grow to manage up to 100. Reliable firmware includes a multiple access, anti-contention data packet system, allowing any site to communicate with any other site over wire-line, subcarrier or half-duplex UHF radio. The same firmware allows expanding the system by adding additional sites or channels at any time. For a system to grow with, not out of, expand with the DRC190.

PROGRAMMABLE EXPANDABLE AFFORDABLE DRC190

HALLIKAINEN & FRIENDS
141 SUBURBAN E4 805 / 541-0200
SAN LUIS OBISPO, CALIFORNIA 93401-7590 USA

Rip Off (continued)

Problems like this are spreading away from engineering, probably because there are more stations without engineers. Our news director was running in circles one day, when I caught him and pulled the nail out of his foot. He was concerned about a "standing order" for teletype ribbons from a supplier who was unable to provide any details of the order, other than he was ready to ship. The newsman had just picked up a batch of ribbons, and this would blow his monthly budget! Again, I explained the routine tactics and key phrases these rip-off artists use, and the problem became a non-problem.

To summarize, the new person on the job is the most likely to have the highest pressure applied by these types, with stories of orders by predecessors. Things can get rough in calls like these, and I suggest you simply ask for a purchase order number, even if you don't use POs. If the person at the other end makes up a number, simply say that is not in the sequence the station uses and he must have the order confused. Tell him if the merchandise is shipped, it will be considered unsolicited and disposed of.

Most of all, be sure and tell the rest of the staff to watch out for these types. They could cost your station a good bit of money, better used to increase an engineer's salary.

Although this deviates a bit from our nuts & bolts style, I feel that it has merit. I've been bit once by these guys and you sure feel stupid afterward. My gift was a light bulb with a dollar-bill inside ??? Also, watch out for the latest gimmick - - copier toner salespeople ... editor.

Mailing Labels

AM, FM & TV BROADCAST STATIONS

Fast Service

100% Accuracy Guaranteed

Select by: Type of Station
Transmitter Power
Geographical Area
Market Size
Commercial / Educational

Cheshire or Pressure Sensitive labels
Total Cost: \$66.00 per Thousand Labels

Phone (800) 338-3264
Broadcast Mail Inc.

LOFTECH AND TS1RM AUDIO TEST SETS

Three Audio Test Instruments Combined In One Unit.

Model TS-1



The Loftechs provide the user with a powerful tool that is capable of making audio frequency tests and measurements with a high degree of accuracy, efficiency, and in less time than conventional test instruments. These unique and reliable test instruments are affordable, and an excellent choice for any audio frequency application.

- Low distortion audio oscillator with a frequency range from 10Hz to 30KHz
- Frequency counter with frequency response of 1Hz to 99.99KHz
- DB meter with a range of -50 to 24dB from 20Hz to 20KHz

Models TS-1 RM-As Shown
TS-1RMX-With Bal. Output



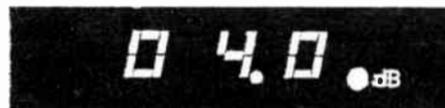
LOW DISTORTION OSCILLATOR

The TS-1 features a current controlled, state-variable oscillator. This is a true sine wave oscillator and not a function generator. Distortion components are typically 0.1% 2nd and 0.05% 3rd which are low order and not audible. The TS-1 is therefore useful in making listening tests, where a function generator would generate undesirable, audible side-effects. Full frequency sweeps can be made from 20Hz to 20kHz in a single range. The TS-1 incorporates a fast AGC and has no amplitude changes over its entire frequency range.



FREQUENCY COUNTER

The frequency counter is internally connected to the internal oscillator and displays the frequency of the oscillator until a signal is plugged into the meter input. It then displays the frequency of the input signal. The frequency counter is disabled below -40dB to avoid induced count errors. Below 10kHz the counter updates twice a second unlike most counters which only update once a second. Above 10kHz it updates ten times per second. This unique combination of Frequency Counter and Audio Oscillator affords absolute precision in setting frequencies.



dB METER

The TS-1 dB Meter is a wideband, average responding A. C. Voltmeter. The output of this meter circuit is electronically converted to decibels for display. Providing the user with the ability to make measurements directly in decibels greatly simplifies measurement and alignment procedures. The logarithmic nature of decibels eliminate the need for range switches. A reference level for "0 dB" is factory set for 0.775v which can be user adjusted +/- 10dB with a rear panel control.

Rochester Radio Supply

511 18th Street SE
Rochester, MN 55904
(507) 280-9668

Loftech Audio Test Sets:

Model TS-1 \$249

Model TS-1RM . . . \$297

Model TS-1RMX . . \$367

Contract Engineers

Radio Guide will provide space here for contract engineers wishing to expand their business. To be listed here, just give me a call at (507) 280-9668. This list is not a recommendation of any particular engineer.

Tom Becker
Miami, Florida
305-775-1351

Peter C.L. Boyce
Midamerica Electronics Svc.
New Albany, Indiana
812-945-1209

James Boyd
Boyd Broadcast Tech. Svc.
Tualatin, Oregon
503-692-6074

Mike Brown
Portland, Oregon
503-245-4889

Lee Freshwater
Blue Ridge Consultants
Flat Rock, North Carolina
704-693-1642

Chuck Gennaro
Wisconsin Rapids, Wisconsin
715-423-6763

Kirk Harnak
Memphis, Tennessee
901-278-1366

Richard A. Hyatt
Maine Engineering Assoc.
Gardiner, Maine
207-582-4192

John Morton
Durango, Colorado
303-247-8734

Don Musell
Broadcast Engineering Svc.
Mouth of Wilson, Virginia
703-579-4461

Mark Pallock
Marandee Broadcast Eng.
Chatsworth, California
818-882-9475

Ransom Y. Place III
Danbury, Connecticut
203-798-9395

John Ramsey
West Hartford, Connecticut
203-243-4703

Christopher Scherer
Miami, Florida
305-667-5918

Lee Soroca
Soroca Electronics
Syracuse, New York
315-468-5123

Tom Toenjes
Signal Specialists
St. Marys, Kansas
913-437-6549

Dave Wrenn
Aiken, South Carolina
803-649-1663

Brad Johnson
Central California
209-526-6277

Scott Dean
Dean Engineering
Fresno, California
209-434-2358

Gary Smith
Advanced Technical Svc.
Abilene, Texas
915-672-5149

James A. Chase
Electro-Labs
Angola, Indiana
219-665-6427

Gary Reardon
Ware, Massachusetts
413-967-6156

James Droege
Electronic Engineering Svc.
Beatrice, Nebraska
402-228-0780

Michelle Hunt
Denver, Colorado
303-469-1293

Tim Pozar
Broadcast Engineering Cons.
San Francisco, California
415-695-7727

Mark Bohach
Columbus, Ohio
614-385-7583

Bob Ladd
Bellevue, Ohio
419-483-2511

Dave Hebert
Pasco, Washington
509-545-9672

Dave Biondi
The Radio Service Company
Houston, Texas
800-444-2301

Bud Stuart
STURADCO
Susanville, California
916-257-7820

Ronald J. Dot'o Sr.
Salem, Oregon
503-378-7024

John L. Nix
Salem, Oregon
503-581-4056

Steve Agnew
Broadcast Technical Svc.
Lincoln, Nebraska
402-475-8920

Marsh Johnson Sr.
Broadcast Operational Sys.
Albany, Oregon
503-928-8318

Carl Sampieri
Sampieri Engineering
Huntsville, Alabama
205-830-8300

Don Roden
Roden Engineering
Huntsville, Alabama
205-533-3676

Don Haworth
Haworth Engineering
Fargo, North Dakota
701-237-5346

Jim Taylor
Jim Taylor Engineering Svc.
Augusta, Georgia
404-738-2911

Mike Tosch
Interstellar Broadcast Eng.
San Diego, California
619-576-8239

Jeff Twitley
Ocean City, Maryland
301-289-4545

Howard M. Ginsberg
Communications Eng. Inc.
Essex Junction, Vermont
802-878-8796

Donald Frank White
Roanoke Rapids, No. Carolina
919-535-2599

Adam Perry
S&B Communications Inc.
Buffalo, New York
716-832-7090

Thomas C. Taylor
Total Communications Tech.
Old Fort, North Carolina
704-668-7977

Roger Cucci
Techworks
Milford, Connecticut
203-878-3196

Harold Snure
Calvmet Business Comm.
Merrillville, Indiana
219-769-4044

Dwayne Burlison & Assoc.
Houston, Texas
713-890-6565

Rick Cruz
Mount Vernon, Ohio
614-397-6440

Mark Persons
M.W. Persons & Associates
Brainerd, Minnesota
218-829-1326

Hal Ross
Air Com Communications
Greenville, Pennsylvania
412-588-8999

Russell Hines
Cincinnati, Ohio
513-721-7625

Jim Zastrow
Zastrow Technical Service
Schofield, Wisconsin
715-359-9282

Steve Holderby
Bernsco Inc.
Oklahoma City, Oklahoma
405-943-2409

ACM Communications
Napa, California
707-257-6000

R. Michael King
Circuit Doctors
Frisco, Colorado
303-668-3167

Joe Bellis
RMF Associates
Cape Girardeau, Missouri
314-651-4272

Brian Walker
Olympia, Washington
206-438-2390

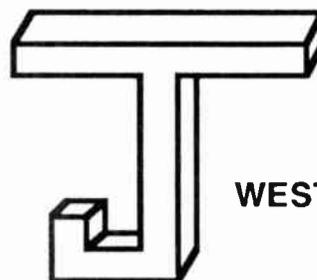
Jay Brentlinger
Broadcast Engineering Inc.
Phoenix, Arizona
602-867-0181

Ken Bartz
Bartz Engineering Services
Fargo, North Dakota
701-237-3006

Greg Blanchard
Avila Engineering
San Luis Obispo, California
805-473-2396

J. Boyd Ingram
J. Boyd Ingram & Associates
Batesville, Mississippi
601-563-4664

Anyone Else?



SQUARED
TECHNICAL SERVICE

543 WEST 100 NORTH
WEST BOUNTIFUL, UTAH 84010

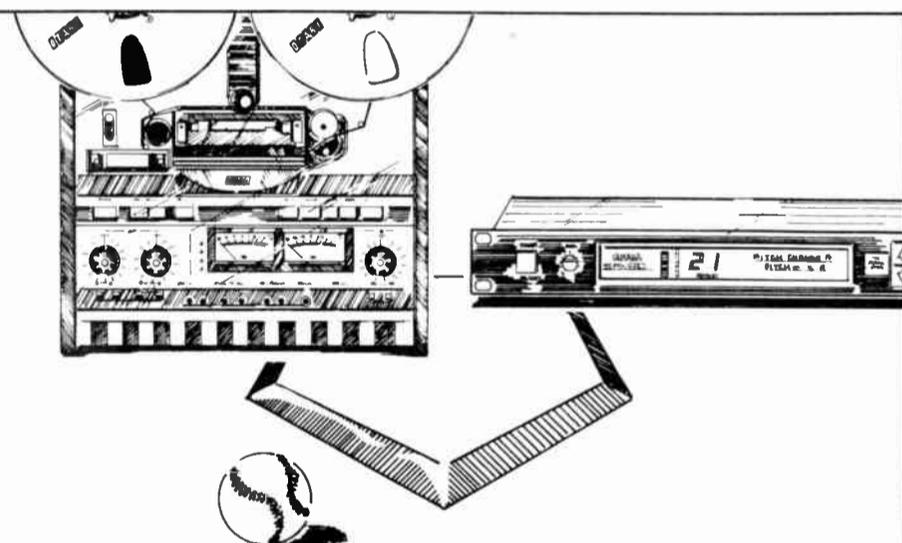
801-298-8515

EQUIPMENT REPAIR AND CALIBRATION SERVICE

WE SERVICE MOST AM/FM BROADCAST MONITORS,
REMOTE CONTROL SYSTEMS, EXCITERS, STL's, TSL's,
RPU's, ETC.

GIVE US A CALL

- CHECK OUR RATES-
- TURNAROUND TIME-
- STL LOANER PROGRAM-



Combo Savings Team! Great Double Play!

Improve your ERA (Excellent Recording Average) with an Otari 5050B Mark II and a Yamaha SPX 90 II. Get both at a special low combo package price for a limited time. Think of the sound possibilities! Think of the savings! It's two on and nobody out. Bring this great team home!

Call for details NOW!
1-800-798-2342

The
AUDIO
broadcast group inc.

2342 S. Division Avenue • Grand Rapids, MI 49507

© 1989

Discover the Delta Difference.

In addition to AM Stereo, Bridges, and Ammeters, Delta provides a rugged line of products for your FM or TV facility. Fully interlocked Coaxial Transfer Switches, a Transmitter Power Controller, and the new High Power Pulse Reflector all ensure your station operates efficiently. To experience the Delta Difference, contact John Bisset today at (703) 354-3350. Delta Electronics, Inc., 5730 General Washington Drive, Alexandria, VA 22312.

The Above Standard
Industry Standard.

DELTA ELECTRONICS

©1989 Delta Electronics, Inc.



FCC's Engineering AM, FM and TV Data Bases On floppy (or) 9-track tape

Call today to request a free sample

Data for Small Systems
Suite #236
2020 Pennsylvania Ave. NW
Washington, DC 20006
(703) 276-9442

SBE STANLEY BROADCAST ENGINEERING

James S. Stanley
Engineering Consultant

P.O. Box 24601
Tempe, AZ 85282

(602) 264-8752

Sell your product
or service here

Call Ray Topp

Rochester Radio

511 18th St. SE

Rochester, MN 55904

(507) 280-9668

FCC Database

ONLINE SERVICES

- 24-hour Remote Access
- AM, FM, FMTX, NCE-FM, TV, LPTV, ITFS Studies/Searches
- Terrain/Population FAA & FCC Tower Databases
- Predicted Contours
- DATAFLEX – user-specified sort/retrieval programs
- FLAGSM SERVICE – Broadcast site monitoring report

dataworld[®]

A Service of DW, Inc.

P.O. Box 30730
4827 Rugby Avenue, Suite 200
Bethesda, Maryland 20814
(800) 368-5754 (301) 652-8822

Consulting Communications Engineers

- FCC Data Bases
- FCC Applications and Field Engineering
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV

OWL ENGINEERING, INC.

Consulting Communications Engineers

1306 W. County Road F, St. Paul, MN 55112
(612) 631-1338 "Member AFCE"

NORTHERN MAGNETICS

CERTIFIED TAPE HEAD SERVICES

Northern Magnetics is an industry leader in the supply and service of tape heads and tape head products.

P.O. Box 16409
Minneapolis, MN 55416

Phone: (612) 333-3071
Telex: 1561238 MPS UT
FAA Repair Station # C14-57

Delta
Inovonics FMX & NRSC
L.P.B.

All the Major Brands at Competitive Prices

Energy Onix
Hnat Hindes
CRL Stereo TV

Ron Radio Communications

P.O. Box 201
Brightwaters, NY 11718
"Professional Broadcast Engineers serving the Industry"
800-666-3525

AM-DA Adjustment
Frequency Searches
License & CP Applications
Studio Installation

Jim Saunders
President

Radio Guide

March, 1989 Volume 2 - Issue 3

Mail to: Radio Guide 511 18th Street SE
Rochester, MN 55904

Fill out the information below, and then circle the number of any manufacturer from which you would like additional information.

- | | |
|-------------------------------|------------------------------------|
| 1 - Hnat Hindes | 14 - Henry Engineering |
| 2 - Bext Inc. | 15 - Bradley Broadcast Sales |
| 3 - RAM Broadcast Systems | 16 - Northeast Broadcast Lab |
| 4 - Noise Free Radio | 17 - Hallikainen & Friends |
| 5 - Ramko Research | 18 - Broadcast Mail Inc. |
| 6 - Kahn Communications | 20 - Audio Broadcast Group |
| 7 - Broadcast Devices | 21 - J-Squared Technical Svc. |
| 8 - Tom Jones Recording | 22 - Inovonics Inc. |
| 9 - Broadcast Audio | 23 - Data World |
| 10 - Titus Technological Labs | 24 - Delta Electronics |
| 11 - CRL Systems | 25 - Stanley Broadcast Engineering |
| 12 - Commercial Radio Co. | 26 - Data for Small Systems |
| 13 - Econco | 27 - Northern Magnetics |
| | 28 - Ron Radio |

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____ Phone _____

FMXTM Stereo Works!

By the end of 1988, more than one hundred stations were either on-air in FMX[®] Stereo or committed to do so. At the Winter '89 CES Show, prototype or production receivers were on display by Alpine, Blaupunkt, Denon, JVC, Proton and Sansui. Dealer orders were being taken for April deliveries of the Alpine 1390 and JVC 5900 auto stereos with the FMX System.

FMX Stereo works. It offers the FM broadcaster a significant increase in primary stereo coverage, and is fully compatible with existing receivers and station equipment. This has been proven with more than 125,000 actual broadcasting hours to 70 million potential listeners.

But don't take our word, or anybody else's! Try it for yourself. We can arrange a two-week trial at your station.

Our FMX Stereo Generator utilizes simple and inexpensive digital circuitry to yield spectacular performance at surprisingly low cost.

Priced under \$2000, Inovonics' 705 delivers better stereo than you're probably getting now. It installs in minutes with no modifications to existing equipment. And it works with any audio processing, even when it's internal to the present Generator!

Inovonics is proud to be a pioneer in this exciting new technology. Our first goal has been to quickly bring FMX Stereo within the budgetary reach of any broadcaster. And at the '89 NAB show we will debut yet another FMX Stereo product.

Call us now for straight answers
to your questions about FMX Stereo.

FMX is a registered trademark of Broadcast Technology Partners.

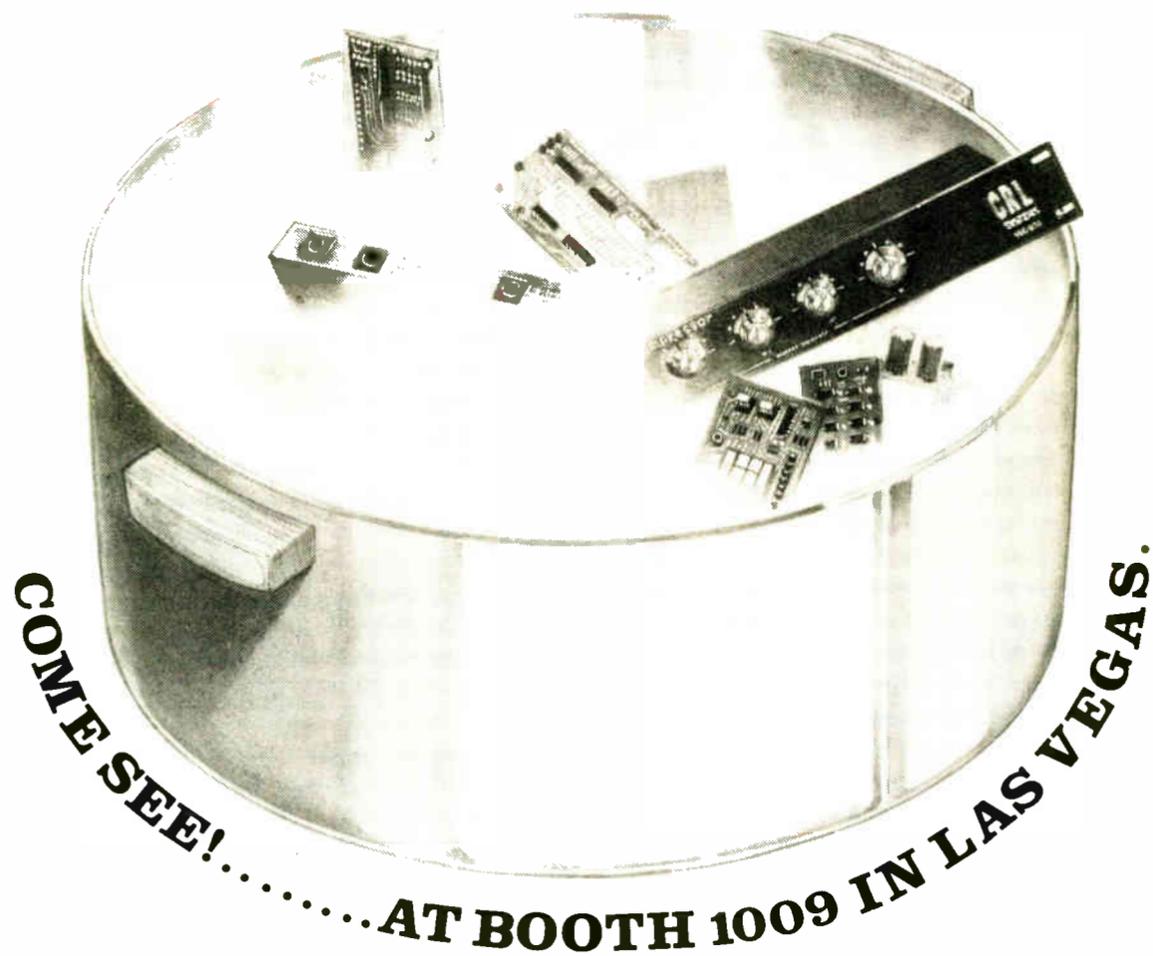
Inovonics Inc.

1305 Fair Avenue
Santa Cruz, CA 95060

Tel. (408) 458-0552
FAX: (408) 458-0554
TTY: (408) 458-0557
Tlx. 3730800



What are the People at CRL Cooking up Now?



**THE
PROFESSIONAL'S
CHOICE**



CRL Systems
2522 West Geneva Drive
Tempe, Arizona 85282
(800) 535-7648 (602) 438-0888
TELEX: 350464 CRL TMPE. UD.



Equipment Guide



Box 7001 Rochester, MN 55903 (507) 280-9668 Ray Topp - Editor

This is the new Used Equipment Guide. I took about three days to try to come up with a catchy name for this publication - - oh, well.

There are two reasons why I think used equipment publications and forums in the broadcast industry have failed. First, a large portion of the equipment you see in the classified section has already been sold by the time you call. There are a couple of reasons for that. When you have used gear for sale, you usually tell your friends and other nearby stations about it - - if you're lucky, it gets sold that way. Many time it does, and nothing wrong with that. The real problem seems to be with the classified ads that appear three or four months after the equipment is sold!

The second reason classified ads fail, is that not enough space is allowed to completely and properly describe the equipment for sale. I get pretty tired of all the acronyms used, to try to stay within the word limits imposed by other publications.

We will solve the first problem by charging \$3.00 per ad, per month. If you advertise your used lawnmower in your local want-ads for a few bucks, it stands to reason that it shouldn't be too much to ask for those same few dollars, to advertise your console worth \$800 or your transmitter worth \$8,000. It's simply a way to help to insure that dead ads will not continue month after month - - long after the equipment has already been sold.

The second problem is solved by allowing you to use as many words as you feel you need, to completely describe your equipment. We all know that a transmitter is not a transmitter. A used box in

prime condition (one that has had excellent maintenance in a climate-controlled environment), should definitely bring a better price than one in a dirty shed (home to generations of rodents). How do you describe the difference between these two transmitters in "25 words or less?" You can't! In the Used Equipment Guide, you will! All I ask is that you control yourself, and don't go on about how it would have been in better condition but for the fact that your lousy GM didn't give you the tools or the parts to keep it in shape. Of course, if you want to sell your lousy GM as used equipment . . .

The advertisers that you see in the Equipment Guide will be those that deal, a large part, in the used and reconditioned equipment field. In this way, you will, in one publication, be able to find out what's available in the used equipment area.

We will also publish help wanted and situations wanted for free. The job shortage in the radio technical community is pretty sever. Let's help each other out.

In this first issue the pickings are pretty slim. But you can change that! Just as the Radio Guide serves your technical information needs, let's help to make the Equipment Guide serve your used equipment needs.

I've done my best to create a Used Equipment Guide that will be of some use to you. I've tried to do it in a way that will eliminate some of the problems that have plagued other publications. Have I done the right thing in the right way? Do you think \$3.00 per ad is a fair price? Let me know! Your suggestions and comments will be used.

Here's What To Do:

- 1 - Describe your used equipment for sale, in as many words as you feel it takes to do the job.
- 2 - Describe your help wanted or position wanted.
- 3 - If you have equipment for sale, enclose \$3.00.
- 4 - If you have a help or position wanted ad - no charge.

Here's Where To Send It:

Equipment Guide
Box 7001
Rochester, MN 55903

Name: _____

Station: _____

Address: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone: _____

Hall Electronics

1712 Allied Street
Charlottesville, VA 22901

804-977-1100

Fax 804-979-0978

We buy used equipment

We sell rebuilt equipment

We also trade new and rebuilt
equipment for used gear

Beat the #1* Killer

(*Temperature Extremes Kill Transmitters)

TEMPSENZ
Remote Temperature
Sensor

List \$195⁰⁰



Now
\$99⁹⁵
While Supply
Lasts

- Works With Any Remote Control
- Constantly Monitors Transmitter Temperature
- Easy to Install and Calibrate



barrett associates, inc.

BROADCAST • AUDIO EQUIPMENT

(619) 433-5600

(800) 748-5553

1975 RCA BTF-20E on 100.5
mHz.

Good condition. Out of service 5
months.

Spare final and other parts.

A great main or standby.

Available now for \$8,500 FOB
Mississippi.

WBLE

PO Box 73

Batesville, MS 38606

Call 601-563-4664

J. Boyd Ingram

Gates FM-10H3 at 92.9 mHz.

This one operated well, until
removed from service recently
for power upgrade. It has some
spares and a TE-3 exciter.

Gates FMC-6bay antenna

tuned for 92.9 mHz, but may be
re-tuned. It has de-icers and its
matching transformer. Let's talk.
We'll listen to all offers.

Bob Williams

KRWN

Farmington, NM

505-327-4449

9-SMC 350 Carousels - \$500
each

**3-SMC green equipment cabi-
nets** - \$100 each

1-SMC EPS-1 computer with
logging (including data terminal
& printer) - \$1000

1-SMC RAC-31 remote control -
\$200

1-SMC PDC-5 clock - \$100

1-SMC TAC-1 time announce
dual cart - \$300

1-SMC DS-20 audio switcher
(problems) - \$200

1-Marti RMC-2 remote control
system - \$500

1-Gates Stereo Statesman
audio console - \$400

1-Orban 621B parametric
equalizer - \$300

2-Elcom Insta-Peak II gain
reducer - \$200 each

1-SMC 121 cart recorder
(needs bearings) - \$600

Jerry Jeske

KVLY-FM

Edinburg, TX

512-383-7478

ITC Premium R/P, perfect
condition - \$995

ITC Premium delay R/P - Best
Offer

ITC PDII R/P - Best Offer

**QEI FM Mono modulation
monitor** - Best Offer

RCA BTE-15 Exciter with
stereo & SCA generator - Best
Offer

ERI FML3E, 4 years old, 101.7 -
Offer

Andrew 1 5/8" foam line, 350
feet, new - Offer

Andrew 1 5/8" connectors,
adapters, relays, all new - Offer

Orban 8000A, with manual -
Offer

Orban S/T chassis for 8100A -
Offer

**Prodelin automatic de-hydra-
tor** - Offer

Tapecaster 700P mono play-
back - Offer

Spotmaster 500C (missing
board) - Offer

Scala FMV 100 watt 88-108
antenna, for low power or
standby - Offer

Micro-Trac 4-pot stereo mixer
(new) - Offer

JBL 6-channel PA-style mixer
(new) - Offer

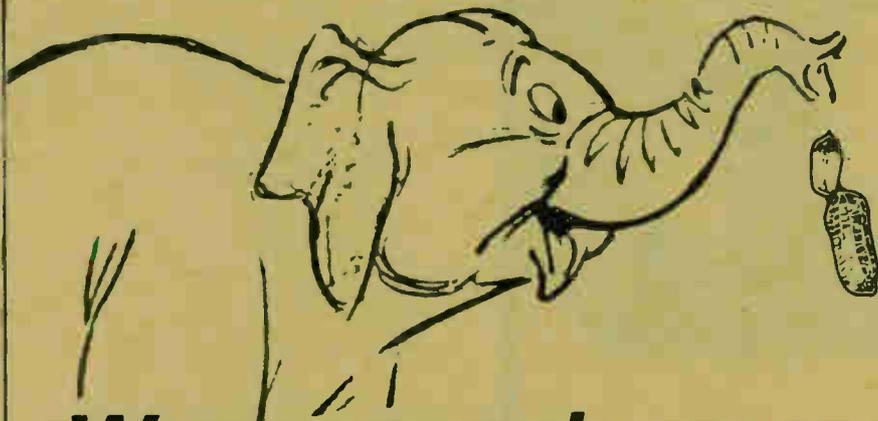
Misc 100 watt PA, speakers,
mikes - Offer

Jim Phillips

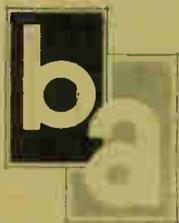
WZOM

Definance, OH 43512

419-782-8591



We remember our customers even after the sale is complete.



(619) 433-5600

barrett associates, inc.
BROADCAST • AUDIO EQUIPMENT

Trusscon self supporting tower. On the ground near Des Moines, Iowa. Re-installation and concrete base plans are available. - Best Offer

2-Anixter-Mark P-9A72GN1, 950 mHz, 6-foot STL grid dishes. One dish will require new feed assembly. Both have M1 mounts for up to 3 1/2" O.D. pipe. Four years old - Best Offer

Jeff Hansen
KDMG-FM
100 Court Ave.
Suite 103
Des Moines, IA 50309
515-282-1033

Moseley MRC-1600 remote control configured for STL use. 110 kHz control sub-carrier and 92 kHz SCA telemetry return - \$2500 or best offer

Lee Eichelberger
KIDO Radio
208-344-6363

Truscon 350 foot guyed tower, 48-inch face, solid rod with lighting, guys, base insulator and 60 foot antenna pole - Call

Orban 9000A/1 AM Optimod, like new - \$2000

Orban 8100/ST studio chassis for split operation of Optimod 8100A - \$500

Gates Executive stereo console, 10 pots, good condition - \$1500

Harris ME-1 modulation enhancer for MW series transmitters - \$100

RCA BW-66F tube type AM modulation monitor - Best Offer

Harris SC-90 automation controller with power supply, numeric logging, console and **SMC-250RS** carousel with interface - Best Offer

Gates ATC Criterion-1 cart machine, several available - Best Offer

William C. Galsser
Director of Engineering
WHBC
Canton, OH
216-456-7166

RF meters, used and tested
Sangamo mica transmitting capacitors, assorted sizes, large variety

Dan's Discount Radio Parts
Cavendish, VT
802-226-7582

Wanted

Old transmitting equipment catalogs, Collins and RCA, from the 1950s and 60s. I'll pay you for them or photocopies.

William C. Irvin
WHIS/WHAJ
900 Blufield Ave.
Bluefield, WV 24701
304-327-7114

35 kW or dual 20 kW FM transmitter in good to perfect condition. Also in need of studio equipment of all types. All equipment must be in prime condition - - no junk please.

Box 7001
Rochester, MN 55903

Risk...

buying used equipment and hoping it works.

Security...

buying reconditioned equipment with a 6 month warranty.

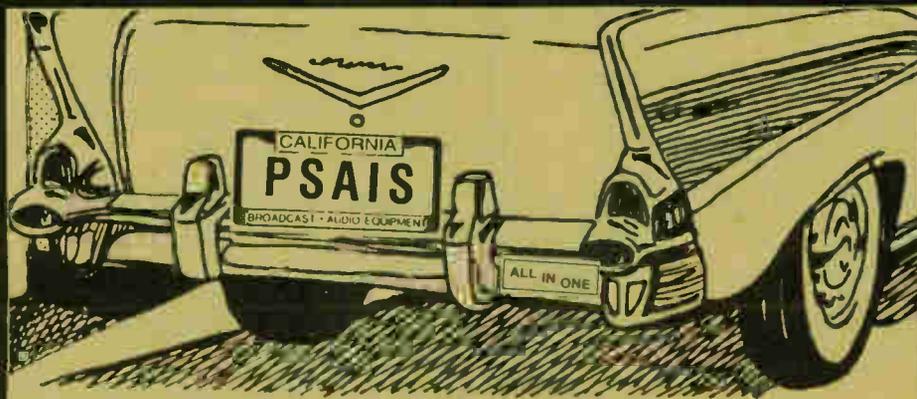


barrett associates, inc.
BROADCAST • AUDIO EQUIPMENT

(619) 433-5600

(800) 748-5553

We take the risk out of purchasing equipment.



PLAN:

Expert assistance in station planning

SUPPLY:

The only distributor giving you a choice.
New product or reconditioned & guaranteed

ASSIST:

Assistance in financing, technical problems,
even employee selection

INSTALL:

We can provide our expert engineers to
install all or part of your station

SERVICE:

After the sale verifying your satisfaction with
the simplest to the most complex equip-
ment. We pay attention to your needs after
the sale.



barrett associates, inc.

BROADCAST • AUDIO EQUIPMENT

(619) 433-5600

(800) 748-5553