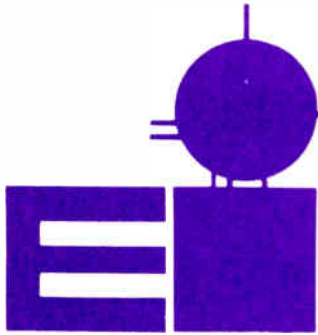


Jan. 1990

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NAB Says License Renewal Reform Needed; Calls for Additional Changes in FCC Proposal

WASHINGTON, The National Association of Broadcasters, in comments on the Federal Communications Commission's proposed revision of its comparative license renewal process, concurred with the need for reform but said it believes some additional changes are needed as well.

In its filing, NAB praised the Commission's earlier action limiting payments to competing applicants and petitioners to deny licenses as "a giant leap toward eliminating sham applications and frivolous petitions historically used as a means of extortion upon licensees facing renewal." NAB also said that forcing competing applicants to develop their own engineering data instead of using the incumbent licensee's would weed out many sham challengers.

However, in response to the Commission's latest proposal on competing applicants, NAB said renewal expectancy should not be based solely upon a licensee's issues-program lists, but on the total service to the community, including all programming and non-programming efforts.

NAB said licensees serve their communities in many ways and participation in activities such as charity drives, community fundraisers and educational programs should be encouraged. It said the present wording of the proposal could be construed as having the opposite effect, by sending a signal that the agency is interested only in the issue-responsive programming listed in the

public file as a guide to community service and a renewal expectancy.

Such a result, NAB said, could cause many licensees to reduce worthy non-programming efforts in order to concentrate their limited resources on the one facet of their community service which would gain them a renewal expectancy. The result could be less overall service to the licensee's community, which is not the Commission's goal.

NAB also urged the FCC to retain community and government leader testimony as part of the comparative renewal process. NAB said they often can add relevant insights into a station's reputation and service within the community.

NAB said the Commission also should look at methods which would require challengers to carry the burden of proof. One method would be to examine the challenger's qualifications first, before comparing the challenger with the incumbent. Then an unqualified challenger could be rejected out of hand without proceeding to the comparative stage.

RF Radiation "Hot Spots" Research Project Completed

WASHINGTON, The National Association of Broadcasters, with the support of other media organizations and individuals, has completed a research project analyzing radiofrequency (RF) "hot spots." They were analyzing

ed for their impact on broadcast station evaluations of compliance with the Federal Communications Commission's RF radiation regulations.

Many stations are concerned that strong RF fields measured physically near metallic objects that re-radiate low-level surrounding RF energy (so-called "hot spots") must be considered in assessing compliance with FCC regulations. The initial research results show that these hot spots hold no potential for adverse biological effects and, accordingly, should not impact on station evaluations.

The FCC is expected to act shortly on a pending proceeding that addresses how RF hot spots should be considered by stations evaluating compliance. NAB will either supplement that decision, or file a new petition with the FCC providing the research results.

In addition to NAB, contributors to the project were Capital Cities/ABC; CBS Inc.; NBC, Greater Media, Inc.; Fisher Broadcasting; Television All-Industry Committee; Association of Federal Communications Consulting Engineers; du Treil, Lundin & Rackley; Jules Cohen & Associates; LDL Communications, Inc.; Karl Lahm, of Lahm, Suffa & Cavell, Inc.; and Jules Cohen.

The report, "An Investigation of RF Induced Hot Spots and their Significance Relative to Determining Compliance with the ANSI Radiofrequency Protection Guide," was prepared for NAB by Richard Tell Associates, Inc. Free copies are available from NAB's Science and Technology Department at (202) 429-5346.

Editor's Notebook



With the start of another year and another decade, (technically a new decade won't start until 1991, but who am I to argue with the generally accepted way of thinking), we tend to look back at the past year to see what we've accomplished, or what we wanted to accomplish and didn't. Then when we finish reminiscing about the past we start thinking ahead and setting goals for the coming year(s).

As an example, the beginning of 1989 found me as a "hands-on" broadcast engineer trying to keep a couple of radio stations running and spending as little money as possible doing it. In all fairness though, a recent ownership change had given promise of some big bucks being spent to make some major and long overdue improvements. It looked like it could turn into an exciting year or two. Then in late February I heard that Bob Stroebel, my predecessor in this job, was leaving to take a radio station sales manager's position.

The opportunity for a new type of challenge but still being able to use what

knowledge I had accumulated over the years looked rather interesting. Some discussion with my wife and an interview with the owner of Electronic Industries and here I am. Just goes to show how things can change over the course of a year.

After almost a year in this new job I have no regrets about making the change, although I sometimes do get the urge to take a piece of equipment apart just for the heck of it. One of the nicer things about the job is the interesting people I've been able to meet and talk to from all areas of the country, not just engineers but management and program people too.

A couple of activities that become popular at the beginning of the New Year are the making of resolutions and predictions. I've never been one for making resolutions because most people don't keep them anyway. As for making predictions, I'll leave that for the people who publish the "supermarket-scandal-sheets" who are trying to make a fast buck. After all, how many of them predicted that 1989 would see the major political changes that took place recently in Europe.

Instead of making predictions I'll just leave you with a couple of questions and let you make your own predictions. Will a standard be adopted for HDTV or will it be allowed to go the way of AM stereo? Will the next decade see the demise of AM radio, reel-to-reel and cartridge tape recorders? Will Gorbachev defect from Russia and become George Bush's campaign manager for the 1991 presidential election?
HAPPY NEW YEAR!

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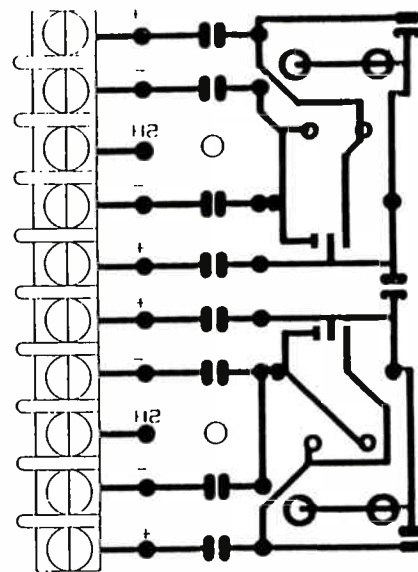
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This instruction book has resistor values for 600 and 150 ohm H and T pads, bridging pads, audio splitting, and combining networks. Dimensions of the "Hooker" Audio Connector Board are 4" x 2 1/2" x 3/4". Two holes are provided to bolt or screw the Board to a metal or wood surface.

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New EPA Requirements For Underground Storage Tanks Have December Compliance Deadline

NAB Announces Advanced Television and HDTV Production Exhibit at 1990 Convention

What You Have To Do

LEAK DETECTION	
NEW TANKS 2 Choices	<ul style="list-style-type: none"> Monthly Monitoring* Monthly Inventory Control and Tank Tightness Testing Every 5 Years (You can only use this choice for 10 years after installation.)
EXISTING TANKS 3 Choices <i>The chart at the bottom of the next page displays these choices.</i>	<ul style="list-style-type: none"> Monthly Monitoring* Monthly Inventory Control and Annual Tank Tightness Testing (This choice can only be used until December 1998.) Monthly Inventory Control and Tank Tightness Testing Every 5 Years (This choice can only be used for 10 years after adding corrosion protection and spill/overflow prevention or until December 1998, whichever date is later.)
NEW & EXISTING PRESSURIZED PIPING Choice of one from each set	<ul style="list-style-type: none"> Automatic Flow Restrictor Automatic Shutoff Device -and- Continuous Alarm System Annual Line Testing Monthly Monitoring* (except automatic tank gauging)
NEW & EXISTING SUCTION PIPING 3 Choices	<ul style="list-style-type: none"> Monthly Monitoring* (except automatic tank gauging) Line Testing Every 3 Years No Requirements (if the system has the characteristics described on page 11)
CORROSION PROTECTION	
NEW TANKS 3 Choices	<ul style="list-style-type: none"> Coated and Cathodically Protected Steel Fiberglass Steel Tank clad with Fiberglass
EXISTING TANKS 4 Choices	<ul style="list-style-type: none"> Same Options as for New Tanks Add Cathodic Protection System Interior Lining Interior Lining and Cathodic Protection
NEW PIPING 2 Choices	<ul style="list-style-type: none"> Coated and Cathodically Protected Steel Fiberglass
EXISTING PIPING 2 Choices	<ul style="list-style-type: none"> Same Options as for New Piping Cathodically Protected Steel
SPILL / OVERFILL PREVENTION	
ALL TANKS	<ul style="list-style-type: none"> Catchment Basins -and- Automatic Shutoff Devices -or- Overflow Alarms -or- Ball Float Valves
* Monthly Monitoring includes: Automatic Tank Gauging, Vapor Monitoring, Interstitial Monitoring, Ground-Water Monitoring, Other Approved Methods	

When You Have To Act

TYPE OF TANK & PIPING	LEAK DETECTION	CORROSION PROTECTION	SPILL / OVERFILL PREVENTION
New Tanks and Piping*	At installation	At installation	At installation
Existing Tanks** Installed: Before 1965 or unknown 1965 - 1969 1970 - 1974 1975 - 1979 1980 - December 1988	By No Later Than: December 1989 December 1990 December 1991 December 1992 December 1993	} December 1998	} December 1998
Existing Piping** Pressurized Suction	December 1990 Same as existing tanks	December 1998 December 1998	Does not apply Does not apply
* New tanks and piping are those installed after December 1988 ** Existing tanks and piping are those installed before December 1988			

WASHINGTON, The National Association of Broadcasters will sponsor a combined Advanced Television and High Definition Television (HDTV) Production Exhibit at its 1990 Convention in Atlanta. This special exhibit, for which space is still available, will be held at the new Atlanta Inforum, from Friday, March 30, through Monday, April 2.

The exhibit area of 100,000 square feet far exceeds all previous advanced television exhibits both in size and scope. The exhibit will allow attendees to experience, for the first time, a complete view of HDTV applications at one central location.

The exhibit will emphasize the integral relationships and different aspects of advanced television technology. Adjacent demonstration areas will feature the proponent systems for terrestrial transmission of advanced television and HDTV production equipment and systems applications.

Sponsored and organized by the NAB Science and Technology Department, the exhibit is independent of other NAB Convention displays at the Georgia World Congress Center. Space planning and technical details are being handled by Turner Engineering of Boonton, NJ.

A major portion of the HDTV Production Exhibit will be sponsored and implemented by the HDTV 1125/60 Group, a consortium of HDTV equipment manufacturers and producers. However, a limited amount of space is available for other manufacturers of HDTV equipment or systems. Applicants should submit a written description of their HDTV product or system application and space requirements to NAB Science and Technology, 1771 N. St., NW, Washington, DC 20036-2891, or fax to (202) 429-5343.

Applications for space must be received by January 2, 1990. Selection criteria will be based on date submitted, technical relevance and perceived interest of attendees. For further information, exhibitors should contact NAB Science and Technology at (202) 429-5346.

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 Two speed. Pitch control. Tonearm, dustcover and base included.
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.....Interfaces magnetic phono cartridges for optimum calibration of audio systems. Available with balanced or unbalanced output.



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 A demand tonearm in many engineering and programming circles.
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 Comes with a fine cut elliptical diamond that provides outstanding listening characteristics while tracking at the very lightest forces and tracing the record grooves accurately.

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While you're broadcasting that important event, you can supply audio up to 3 headsets at once and control their level by a front panel pot. The audio level feeding the telephone line is controlled by a built-in limiter with the limiting action displayed by a LED bar-graph meter. The RUSSCO TELEMOTE 321 also incorporates a signal bell that allows calls originating at your station to be received at your remote location. Also, you may route the audio from a portable radio into the mixer for on-air checking with the program off the phone line. You'll like the convenient tilt-stand that doubles as a handle.

The RUSSCO STELLAR TELEMOTE 321 3 CHANNEL MIXER makes life easy for you. No batteries or AC plugs to worry about. Just hook up to your phone line and you're on the air! Don't wait any longer, order yours today!

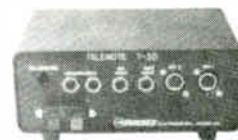
SPECIFICATIONS:

2 Low Impedance microphone inputs (250 OHMS) 1 Medium Impedance Tape Recording input matches anything from 8 OHM Tape Recorder Output to 10 K OHMS output. 8 Inches Wide X 6 Inches Deep By 3 Inches High. Weight 3 Pounds. Case: Anodized Aluminum Cabinet with tilt up stand. Frequency response of Unit ... 30 Hz to 15 KHz. Maximum Distortion 1 Percent.

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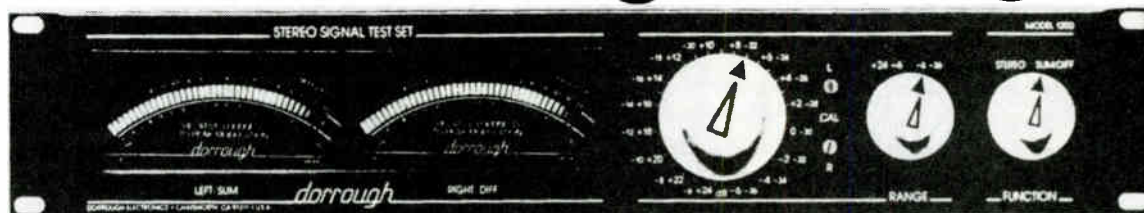
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Separation
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NEW PRODUCTS

Modulation Sciences has unveiled the FM Mod/Minder which lets FM broadcasters increase average modulation, use less processing and still stay within FCC limits, yet it doesn't alter the signal in many ways. Quality-conscious stations that process moderately will be able to boost modulation by up to three dB, to levels that are competitive with heavily processed stations. Aggressive broadcasters will be able to back off on their processing and deliver a higher quality signal to their listeners without incurring a loudness penalty.

Belden Wire and Cable is offering a miniature twisted pair audio interconnect cable in multiple colors for internal and external, TV and radio studio equipment wiring and sound system installations.

Sure Brothers has introduced its L Series wireless microphone system. Designed to provide professional features and outstanding reliability, the L Series L1 body pack transmitter offers features such as wide-range audio gain control, mirror image companding and a full 50 mV output level. A noiseless audio mute switch allows cut-off of sound from the instrument of microphone without shutting off the transmitter, and the LITA4M universal input connector permits use of the transmitter with other compatible microphones and electronics musical instruments.

Sennheiser has developed the MKG 70 P48 RF condenser microphone. Utilizing a symmetrical push-pull transducer, it is designed to eliminate intermodulation distortion while offering increased headroom. Optimal resistive loading of the diaphragm results in a highly linear frequency response, and an inherent low noise level. The MKH 70 employs Sennheiser's high frequency circuitry. The transducer is an element of a tuned circuit that forms a phase sensitive demodulator in conjunction with a stable RF oscillator. This is followed by a low noise, class A output amplifier that delivers a balanced signal without the need for an output transformer. When the acoustic pressure level exceeds 124 dB or the mic's high output voltage causes over-modulation, a 10 dB pad can be activated.

Symetrix Unveils DSP-100 at AES
Symetrix, Inc. has announced plans to use the AES Convention in New York as the site of the unveiling of its DPR-100 digital processing recorder and a series of radical new enhancements for the unit.

"In essence, the DPR-100 is an extremely powerful digital audio computer," explained Symetrix president Dane Butcher. "Using the Apple Mac II/IIx/IIcx merely as a system controller, with its easy-to-learn graphics interface, the DPR-100 now offers 40 channels of recording, in blocks of eight, plus real-time level control, equalization, compression, limiting and gating, with

dynamic recall of every system parameter. All record and edit events are locked to SMPTE/EBU timecode, VITC, house sync and/or external word clock. Edit resolution is to the digital sample."

Butcher added that the DPR-100 will be made available in a variety of configurations to handle a broad rainbow of audio production tasks. He said individual systems can be connected together to form "an upwardly-compatible, multi-tasking production environment," which would allow a post facility to purchase a small-format starter system and grow according to the company's needs.

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Brushing Up on Towers

It's easy to forget to paint and light a broadcast tower. This is not a sound policy, for these reasons:

Babying Serves: Had a Hurricane or Earthquake lately?

The best maintained radio towers are generally the ones that remained standing in the face of Hurricane Hugo or the "Series" earthquake. Towers corrode with time; joints weaken with metal fatigue; slack develops in normally taut guy wires, etc. Each of these factors may weaken a radio tower to the point that its resistance to storms and quakes is substantially lessened.

Babying Saves: Has the FCC Inspected Lately?

FCC regulations prescribe certain minimums for basic tower painting and lighting. If your tower does not meet these minimums, you become liable for a fine. Absent special FCC exemption, radio towers must be painted and lighted when they exceed 200 feet in height above ground or are the subject of special aeronautical study. Towers must be cleaned or repainted "as often as necessary to maintain good visibility."

And there are several important record-keeping and control requirements. Licensees are required to observe the tower lights (or a remote in-

dicator) at least once each 24 hours; provide an automatic alarm system designed to detect any light failure; and inspect all automatic or mechanical control devices at intervals not to exceed three months. If a tower light fails, licensees are required to make an appropriate entry in the station's log noting the nature of the problem, date and time the improper operation was noticed, and repair details. If the top tower light is out, be sure to notify the nearest office of the FAA if it cannot be fixed within 30 minutes. Call the FAA again once the light is fixed.

Does the station have to sign off while the tower is being repainted? Unfortunately, for RF radiation reasons, the answer to this difficult question is "yes," at least for stations without the temporary use of another radio tower during the "repainting" period. And be sure to use the best quality paint available.

*Michael Rau,
NAB Science & Technology*

HDTV Growth Projected

Market penetration of high definition television (HDTV) is expected to reach 25 percent of U.S. households by the end of the century, being purchased at a rate faster than either color TV or VCRs.

According to a report by Robert R. Nathan Associates for the Electronic Industries Association (EIA), HDTV will penetrate the marketplace rapidly with 10 percent of U.S. households owning one HDTV set four years after introduction and 25 percent owning one by the year 2000.

Commenting on the report, EIA President Peter F. McCloskey says, "HDTV soon will be part of the American lifestyle. This innovative technology will add a new dimension to American TV viewing as well as strengthen television manufacturing in the U.S."

In addition, EIA's Advanced Television Committee Chairman Sidney Topol notes, "Inherent in the development and adoption of a uniquely American HDTV system are increased opportunities for U.S. manufacturers of video transmission and delivery systems."



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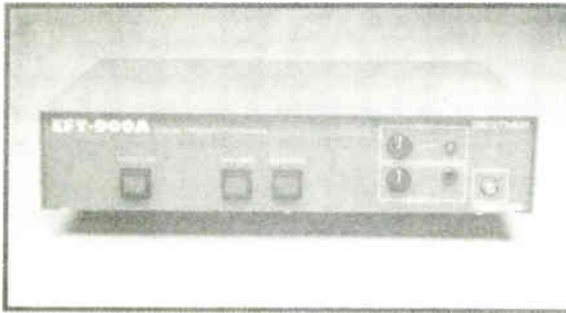
- COMPLETELY CLEANED
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- 72-HOUR TURN-AROUND SERVICE IF REQUIRED
- ALL CARTS PRE-TESTED UNDER ACTUAL BROADCAST CONDITIONS

LENGTH	A-2, 300, M.C., (Std. tape)	AA-3, M.C. II, HOLN tape)	AA-4, Cobalt, (Super-Hot)	Scotchcart (Mastering Tape)
10 sec to 90 sec	\$2.00	\$2.25	\$2.75	\$3.00
100 sec to 4.0 min	\$2.40	\$2.75	\$3.25	\$3.50
4.5 min to 7.0 min	\$2.90	\$3.25	\$3.50	\$3.75
7.5 min to 10.5 min	\$3.25	\$3.75	\$4.50	\$5.00

Replacement of pressure pads extra when needed.
Like-new cart 90 day warrantee

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TELEPHONE PRODUCTS

PRICE \$795

EFT-900A

Digital Frequency Extender

Telephone Remotes With Two-Way Communication.

The telephone is a useful tool for delivering remote broadcasts to the studio quickly and inexpensively. However, these remotes have often been plagued with tinny-sounding audio and difficulties in cueing the remote site.

Gentner's EFT-900A has solved those problems. It improves the sound of the telephone line through frequency extension, Aphex® processing, noise reduction and precision filtering. An internal telephone coupler, headset

output and mic/line input keep your remote equipment needs to a minimum. Even better, the EFT-900A keeps the cost of your remotes low by eliminating the need for a second telephone line for cues.

The EFT-900A provides true two-way communication. The improved interaction between remote site and studio means less time involved in set-up, and no chance of mis-timing spots (the remote talent will hear them in his headset).

With the EFT-900A, your telephone remotes can sound sharper and cleaner, while eliminating most of the set-up hassles and communication problems. The result is happier sponsors and more revenue for your station!

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FM Fined \$2000 for Indecency

The new Commission continued a firm stand on its view of indecency by fining a Detroit FM \$2000 for airing on off-color song during a January 1988 morning show.

WLLZ-FM, which aired at 9 a.m. a recording of an off-color parody was given 30 days to demonstrate in writing why the fine should be upheld or reduced - or to pay it.

The 4 October ruling follows the 24 August citing of three radio stations—WFBQ-FM in Cincinnati, WLUP-AM in Chicago and KSJO in San Jose, CA—for alleged indecent broadcasts.

Those stations, however, were sent letters containing transcripts of the offending broadcasts and given 30 days to respond before a fine was imposed. The WLLZ incident marks the first time the FCC has held a station liable for alleged indecency without first sending an inquiry, the Commission said.

Robot listens, talks back

AT&T Bell Laboratories researchers have created a robot arm which is not only controlled by spoken command but talks back to its human operator.

"SAM" (Speech-Activated Manipulator) understands 158 words and responds to 14 septillion (14 followed by 24 zeros) questions and commands.

Given orders over a telephone line, the robot uses its sensors to find an object described by the operator. It can pick up the object and move it around a table without bumping other objects. SAM asks questions through a voice synthesizer if the operator's instructions are unclear.

SAM's successors may one day work in sterile or hazardous environments—controlled by humans from a safe place.

US Radio Broadcast In USSR

Soviet citizens soon may be tuning in to National Public Radio and other American radio programs as a result of what is called a historic "Memorandum of Understanding" signed here in August.

The agreement between the USSR State Committee of Television and Radio Broadcasting (GOSTE-RADIO) and the US nonprofit Public Service Satellite Consortium (PSSC) makes programs from each country available to radio stations of both using satellite communications.

The action will establish for the first time the exchange of programs from varied sources on a regularly scheduled basis. The program exchange will become operational in early 1990.

Exchanges between Radio Moscow and domestic US stations were instituted as far back as 1958, with occasional satellite exchanges recently.

Transponder Jamming

Nearly four-hour "double illumination" of ABC-TV satellite transponder Sept. 20 (unauthorized uplinking signal wiped out network's standard transmission) cost affiliates seven minutes of *ABC World News Tonight* and cost network six-figure loss in advertising make-goods, according to ABC's president of operations and engineering, Robert Siegenthaler. ABC filed oral complaint with FCC (written complaint to follow) seeking identification of C-band uplinker who eliminated AT&T Telstar 301 transponder with "enormous power." That FCC does not require uplinker identification—through subcarrier or other means—is "mystifying," Siegenthaler said.

Professional Precision For The Professional Recordist The Nakamichi MR-1



Professional Features For True Professional Performance

- Nakamichi Discrete 3-Head Technology
- Asymmetrical Dual-Capstan Diffused-Resonance Transport
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- Low-Distortion Direct-Coupled Electronics
- Balanced Inputs: 1/4-Inch Front Panel, XLR Rear Panel
- Unbalanced Inputs: 1/4-Inch Rear Panel
- Line Input Selector Switch
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- Self-Contained Dolby-B and -C Noise Reduction
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- 16-Segment Linear-Scale (2 dB steps) Peak-Responding Meters
- Independent L/R Record Level Controls
- 3-Position Tape Selector
- 2-Position Equalization Selector
- Defeatable MPX Filter
- Defeatable Subsonic Filter
- One-Touch Record Pause
- Record Mute
- Tape Monitor Indicator
- Line Output Level Control
- Headphone Jack With Independent Headphone Volume Control
- Playback Pitch Control (± 6%)
- 4-Digit LED Tape Counter
- Memory Stop
- Timer Record-Play
- Automatic Slack-Tape Takeup
- Remote Control (via optional RM-200)
- EIA Rack-Mount Adapter With Carrying Handle

Manufacturer's List Price

\$995.00

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MEMO FROM METZ



by
David L. Metz

Rolling Your Own Audio Limiter

A few years ago I had to pay \$500 for a limiter to process the audio on a silly phone line. The ridiculous cost to benefit ratio really stuck in my craw. Oh how times have changed! Now we can build a simple limiter (in stereo no less) for less than \$20.00.

The secret is a wonderful new I.C. from National Semiconductor, the LM13600 dual operational transconductance amplifier (or OTA). The OTA differs from a conventional op-amp in that it has a gain control cell on the output. The gain of the amplifier is controlled by the current passing into this cell, not by an external feedback resistor as in a conventional op-amp.

Use of earlier versions of this device have been limited by the high audio

distortion they generated. The new LM13600 has a diode network that vastly increases the linearity of the device. Typical THD is below .5% and that's just fine for simple processing jobs like phone lines, data transmission systems and remote equipment.

The LM13600 requires a split polarity power supply and will operate from a supply voltage of 2 to 22 volts plus and minus. It comes in a 16 pin DIP package and costs about \$3.00 each.

FIG. 1 shows the limiter I came up with. It's an improved version of the basic circuit shown in the National application notes. I designed this circuit to control the level of an incoming phone line. An obvious application is to process a phone patch so the D.J.'s voice is at the same level as the callers. In practice this circuit kept the dial tone within 3 DB of the voice level.

The circuit works as follows. The linearizing diodes are used to control the gain, not the gain cell (National's idea not mine). The output is sampled by the 100K pot at the output. The audio from the pot is amplified by the buffer and rectified by the buffer stage. The resulting DC varies in voltage with the audio output from the device. The

greater the audio, the greater the voltage.

This voltage is fed back to the diodes at the input by a RC network that establishes the AGC time constants of the circuit. I modified these values to eliminate pumping and speed the release time. I encourage you to experiment with the values of R3, R4 & C1 to see if you can improve the control action.

Both the audio input level to the LM13600 and the setting of the 100K AGC gain pot control the limiting action of the circuit. On mine a 3/4 setting of the AGC gain pot gave the best action. Again experiment to see what sounds best to you.

The trim pot R2 on the input balances the current of the input stage of the op-amp. Adjust it by tuning for maximum output with a tone. Set the tone level to where C1 has less than one volt on it. For noncritical uses, R1 may not even be necessary. Perhaps two fixed resistors would work.

Because of the amount of drive needed to work the gain reduction portion of the circuit the output is around +20DB. To get the voltage down to a

(cont. to pg. 14)

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HIGHEST RELIABILITY

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MODEL 300

20 Sec.
40 Sec.
70 Sec. **\$3.40**
100 Sec.

2.5 Min.
3 Min.
3.5 Min. **\$3.85**
4.5 Min.

5 Min.
5.5 Min. **\$4.25**
7.5 Min.

10.5 Min. **\$4.65**

MASTER CART

20 Sec.
100 Sec. **\$4.20**

140 Sec.
2.5 Min. **\$4.60**
3.5 Min.

5 Min.
5.5 Min. **\$4.95**
7.5 Min.

10.5 Min. **\$5.40**

DYNAMAX COBALT

40 Sec.
70 Sec. **\$4.60**
100 Sec.

2.5 Min.
3.5 Min. **\$5.10**
4.5 Min.

5.5 Min.
6.5 Min. **\$5.55**
7.5 Min.

MODEL A-2

10 Sec.
20 Sec.
40 Sec. **\$3.25**
70 Sec.
90 Sec.
100 Sec.

2.5 Min.
3.5 Min. **\$3.60**
4.0 Min.
4.5 Min.

5.5 Min.
6.5 Min. **\$4.10**
7.5 Min.
8.5 Min.
10.5 Min.

MODEL AA-3

20 Sec.
40 Sec.
70 Sec. **\$4.05**
100 Sec.

2.5 Min.
3.5 Min. **\$4.50**
4.0 Min.
4.5 Min.

5.0 Min.
5.5 Min.
6.5 Min. **\$5.20**
7.5 Min.
8.5 Min.
10.5 Min.

MODEL AA-4

10 Sec.
20 Sec.
40 Sec. **\$4.45**
70 Sec.
100 Sec.

2.5 Min.
3.0 Min.
3.5 Min. **\$4.95**
4.5 Min.

5.0 Min.
5.5 Min.
6.0 Min.
6.5 Min. **\$5.95**
7.5 Min.
8.5 Min.
10.5 Min.

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Using the same simple design and ease of operation which has made its predecessor so popular, the DN-950FA is an industrial strength CD player built to withstand the wear and tear resulting from daily use. It features quick cartridge loading, and functions and dimensions almost identical to other professional broadcast equipment. Moreover, the DENON CD Cart Player™ offers the outstanding sound quality of the compact disc.

The CD Cart Player™ is familiar at first sight.

Adopting the CD Cartridge system, CDs are used and stored in the same manner as current tape cartridges.

The CD Cartridge is more than just a jewel box.

The CDs are permanently stored in CD Cartridges. Upon loading and unloading, a shutter door on the cartridge opens and closes. The CDs are protected from damage resulting from scratches, dust, and fingerprints.

No need for constant watching

The remaining time is digitally displayed and can be checked any time during play. In addition, an End Of Message (EOM) signal is given prior to completion of a selection.

'Instant' cueing

Track selection is facilitated by a quick response Rotary Pulse Encoder dial. Turn the dial the desired number of clicks in either direction to assign track numbers.

Audition cannot be any simpler

As soon as the STDBY/CUE button is pressed during play, the pick-up immediately returns to the last position where the PLAY button was pressed.

DENON'S Real-time D/A Conversion System

Employment of DENON's individual Super Linear Converter for right and left channels eliminates both the "Zero-cross" distortion components and left-right time difference which have the greatest influence on sound quality.

4-times Oversampling Digital Filter

A 4-times oversampling digital filter prior to D/A conversion assures sound quality that is greatly improved with very stable imaging.

CD Cartridge

The Cartridge containing a disc is loaded directly into the player. Upon loading, the player cues to the displayed Track Number. The Track Number is automatically reset to the first track when the Cartridge is unloaded.

Digital Display

Displays the Track Number and either Remaining or Elapsed Time in minutes, seconds, and frames using 7 segment LEDs. Remaining or Elapsed Time is selected via a dipswitch located on the back panel. An additional dipswitch will eliminate the frame counter from appearing on the display.

SELECTOR

Selects Track Numbers. Turn in either direction for instant cueing. Selected Track Number is displayed. One full rotation covers 20 tracks. Turning clockwise increases track count, and vice versa. When turned counterclockwise past 1st Track, the last Track Number on the disc appears.

During Play, using SELECTOR, the next Track Number can be set. Cueing starts when STDBY/CUE button is pressed.

STEREO/MONO Selector

When this selector is set to MONO for a mono broadcast, L and R channels are mixed.

CUE LEVEL DETECT Switches

Used to select cueing levels at the actual beginning of the selected track.

PLAY MODE Switch

Single or Continuous play modes can be selected at the front panel. Under the single play mode, the unit stops upon completion of a specific single track. In the continuous play mode, subsequent tracks are continuously played back, and the unit stops upon completion of the final track on the disc.

PLAY/PAUSE Button

Press once to start Play (red indicator lights). Press once more to engage the Pause mode (yellow indicator lights). During Play, the red indicator blinks upon detecting an EOM setting.

REMOTE Switch

LOCAL: Permits front panel & remote control
REMOTE: Permits remote control, only

EOM Setting Switches

When engaged, the EOM signal is given prior to the completion of program. (Dry contact, 5 to 35 sec., 5 sec. increment adjustable.)

STDBY/CUE Button

Pressed during play, the pick-up instantly recues to the last point where the Play button was pressed and the stand-by mode is engaged. Pressed during Repeat Play when the search function is engaged, the pick-up will enter the stand-by mode at the present selection. The indicator in the button blinks in yellow during Cueing or Track Search.



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RISER-BOND Model 2901B+



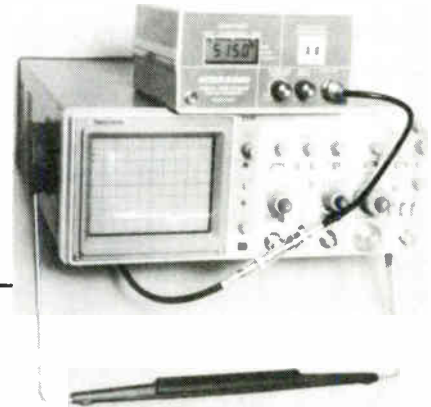
MODEL
2901B+
SCOPE
OUTPUT
CAPABILITY
AND
VARIABLE
SENSITIVITY
CONTROL

DIGITAL TIME DOMAIN REFLECTOMETER
CABLE FAULT LOCATOR

\$845

MODEL
2901B+ ————

"an instrument you can find fault with"



- THE SCOPE OUTPUT CAPABILITY FEATURE OF THE 2901B+ WILL ALLOW THE OPERATOR TO LOOK AT THE TRANSMITTED AND REFLECTED SIGNAL WAVEFORM WITH AN EXTERNAL, CUSTOMER PROVIDED, OSCILLOSCOPE. THE FRONT PANEL LIQUID CRYSTAL DISPLAY WILL SIMULTANEOUSLY INDICATE THE DISTANCE TO THE FAULT IN FEET OR METERS. (Compatible with oscilloscopes of 50MHz bandwidth or greater.)
- VARIABLE RETURN LOSS SENSITIVITY CONTROL TO ASSURE MAXIMUM FLEXIBILITY.
- THE 2901B+ USES THE RADAR TECHNIQUE (TRANSMITTED PULSE/REFLECTION) FOR FAULT LOCATION AND DETECTION.
- FIVE CHARACTER LIQUID CRYSTAL DISPLAY WITH INDICATORS FOR LOW BATTERY, POWERED CABLE, OPEN/SHORT FAULT, AND FEET/METERS.
- RECHARGEABLE NICAD BATTERIES FOR DEPENDABLE, READY-WHEN-YOU-ARE OPERATION.
- THE 2901B+ WILL TEST ALL TYPES OF METALLIC PAIRED CABLE AND IS ENGINEERED FOR SIMPLE, YET VERSATILE OPERATION.
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Common Point/January 1990

Page 13

(cont'd from pg. 10)

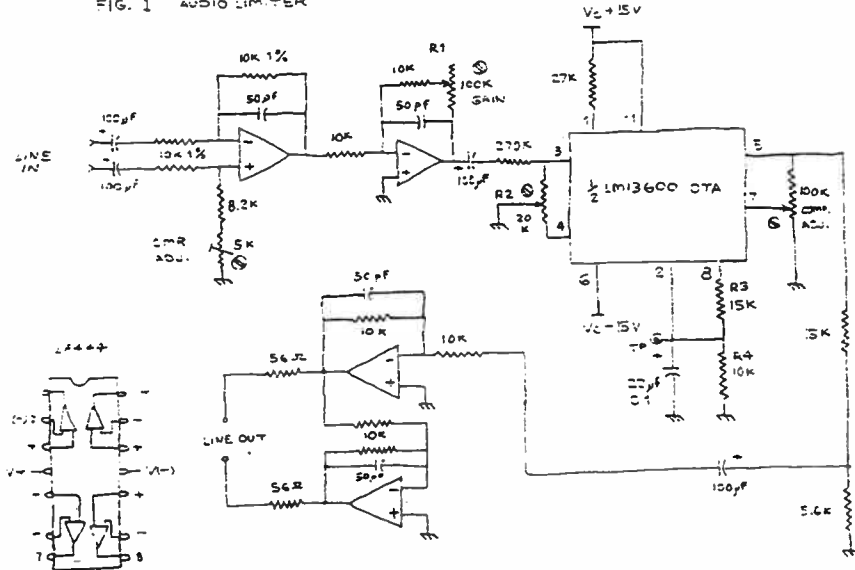
useable level, a simple resistive attenuator is included between the output of the LM13600 and the balanced output stage.

Again I have thrown in a universal transformerless balanced input and output stage. For this circuit I've used the new LF444 quad JFET op-amp. A very low noise fast slew rate op-amp. It's

perfect for driving modern 10K ohm input balanced loads. Don't forget to use good quality 30 to 50 pF silver mica or polyester capacitor across the op-amps to limit their bandwidth. Failure to use a tiny amount of RF feedback here can lead to oscillation and RF rectification.

An interesting improvement might be a meter driver stage so you can observe the level of gain reduction by monitoring the voltage on C1.

FIG. 1 AUDIO LIMITER



NAB/BFM Release 1989 Report on TV's Revenues, Expenses

WASHINGTON, The National Association of Broadcasters and the Broadcast Financial Management Association have published the 1989 Television Financial Report. Profiles of different types of stations (VHF, UHF, affiliates, independents) in different market sizes are included. Also included are breakouts for different station sizes based on net revenues.

This year's report is more extensive than previous editions. It includes a complete set of more than 100 tables for both 1987 and 1988. Each table reports the average and range -- 25th, 50th (median) and 75th percentile case -- of revenue sources, departmental expenses, selected revenue and expense items, and profits for specific groupings of stations. Also included are the averages and ranges of cash flow for each breakout of stations.

The report is generated from the 1989 NAB/BFM Television Financial Survey of all commercial stations. Nearly 75 percent of the 1,057 stations contacted

responded to the survey.

For the average station, 51.0 percent of the total time sales was from local advertising sources, 45.3 percent from national/regional advertising, and 3.7 percent from network compensation.

On the departmental expenses side, program and production costs accounted for 33.9 percent of total expenses, general and administrative 30.9 percent, news 14.4 percent, sales 8.4 percent, engineering 7.2 percent, and advertising and promotions 5.2 percent.

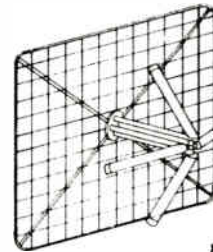
The average and range of cash flow in each table allows for a more thorough comparison of stations. For 1988, the average cash flow margin (as a percentage of net revenues) for affiliate stations responding to the survey, was 38.5 percent. The corresponding value for the average independent station responding was 9.6 percent.

The report is available from NAB Services at \$125 for members and \$225 for nonmembers. Call (800) 368-5644 for ordering information. Stations that responded to the survey have received their complimentary report.



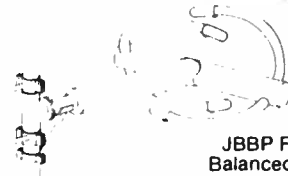
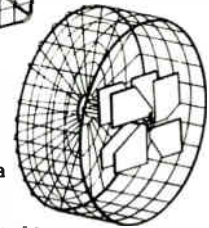
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- Give us your requirements and see how fast we produce.

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ATTENTION

We have had a problem with reading the writing of ads sent in for the classified section, therefore we will **only** accept typed written copy.

WANTED: Rack extender kits for ITC 750/770 tape deck consoles. Call John Managan, KVTI (206) 756-5884.

FOR SALE: 2 - Ampex 600 reel-to-reel machines, as is \$35 each, 2 - Gates 16" turntables with Gray Research tone arms, working when removed from service. \$100 each, 1 - Marti yagi antenna, 161.70 MHZ, brand new, \$100., 2 - MCD Marti microphones, push-to-talk, new, \$65 each, 1 - Gates Solid Statesman console, as is, \$250. Contact Tom Wright, WPMB, (618) 283-2325.

FOR SALE: Rohn stainless steel 80 ft self-supporting tower with all hardware, excellent condition. Includes additional 10 ft. extension section. Call 913-628-8451 1 p.m. - 6 p.m. CST.

WOULD LIKE TO BUY an old, tube-type, 30-watt, Marti remote broadcast transmitter, operating on 162MHZ. Will pay \$300. for good working unit. George C. Shurden, P.O. Drawer 780, Cleveland, MS 38732, 601-843-4091. Thank you for your fine cooperation.

HELP! I have received S/N 94 of the Collins 2121-2 Monaural series and would appreciate copies of the old book (or interconnection schematics, or the address of someone you know who may have these moldy treatises on the console. 512-595-3489, KTAI-FM Campus Box 178, Kingsville, TX 78363.

New Weather Graphics

Weather Central has made its medium, high and ultra high resolution graphics available on the Apple Macintosh computer, with a software program that allows subscribers to dial, acquire and sequence weather graphics for on-air use.

TALKBACK

DULUTH, MN--Look forward to every issue. Good job!

JACKSON, MS--In the Nov. 89 issue, the safety tips for the transmitter site article, item 12, says "use only CO₂ & dry chemical fire extinguishers." I will only use "Halon. The others will put out the fire but the corrosion that follows later is very bad. I've seen a good deal of equipment junked because of this.

New Electro-Voice Full-Line Service Center Opens on East Coast

BUCHANAN, Michigan -- A new full-line service center for repairing Electro-Voice electronic components, microphones and speakers recently opened in Richmond Hill, New York.

The facility, operated by ECS, Inc., provides EV with a full-line service center for the eastern region of the United States, to go with existing facilities in Buchanan, Michigan, and Visalia, California. The telephone number for ECS is 718-846-2600.

"The addition of ECS allows us to fulfill a promise to our customers and dealers to have complete repair facilities located in geographically convenient locations throughout the country," says Frank Spain, EV national service director.

In addition to the full-line service centers, EV also has approximately 160 electronics repair facilities and 80 speaker repair facilities throughout the United States. For the location of the nearest service center, call 616-695-6831.

EV also has consolidated its supply operation for replacement electronic components, with all components now available only at the Buchanan facility.

Electro-Voice, Inc., is a supplier of high-technology microphones, speakers, and electronics to professional markets worldwide and a subsidiary of Mark IV Industries, Inc.



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PMD 221
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PMD 201
(Same as above except
2 head design)
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Accessories: Carry case option available -
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The PR99 MKIII reflects the same engineering expertise that has made Studer Revox the world standard for excellence in audio recording.

Compare these MKIII features with the competition:

- a solid die-cast aluminum transport chassis and head block
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- easily accessible modular electronics for tough, reliable broadcast performance
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- speed configurations of 3 1/2 - 7 1/2 ips & 7 1/2 - 15 ips
- rack mounts standard.

In whatever terrain you operate—in radio production or on-air work—the PR99 MKIII is a no-nonsense machine that gets you where you want to go. Before you buy, check out the MKIII for value and performance. Over the long haul, the Revox PR99 MKIII leaves the competition in the dust.

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