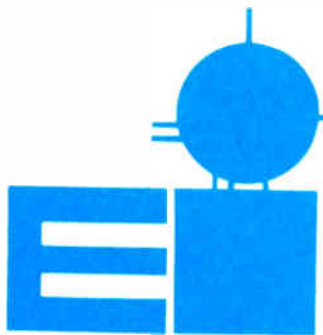


May 1990

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FCC Proposes Changes To FM Translator Rules

Following the filing of a petition by the NAB and requests from state broadcasting associations and individual broadcasters, the FCC has issued a Notice of Proposed Rule making aimed at putting an end to "translator abuse".

While NAB and most broadcasters have long supported the traditional roles of FM translators, the provision of radio service to unserved geographic areas and the filling in of "dead spots" in a station's service area, the past several years have witnessed translators invading well-served markets.

Translators have caused technical interference to full-service radio stations, originated announcements beyond that allowed by FCC rule and evaded Commission rules designed to limit or bar station funding of translators "extending" the station's service area into areas already served by other stations. The Commission's new Notice largely is aimed at ending these practices.

* Continuing to treat translators as "secondary" services.

* Maintaining the 30 seconds/hour limit on translator origination to "acknowledge or solicit financial support." (The Commission asks whether any "advertising" messages should be allowed under the "acknowledging financial support" provision);

* Retaining the prohibition against expanded translator program origination. (Thus, the FCC has decided against allowing translators to become a "low power FM" service.

* Continuing to bar translator use only as "relay stations";

* Continuing the ban on AM rebroadcasts over FM translators.

* Categorizing translator stations as

either "fill-in" facilities or those providing "other areas" service. Fill-in facilities could be operated by the primary station (the station being rebroadcast) or by a separate licensee (which could receive payment from the primary station) but may not extend a 1 mV/m translator signal beyond the "protected contour" of the primary station (0.5 mV/m for Class B stations; 0.7 mV/m for Class B-1 stations; and 1.0 mV/m for all other stations);

* "Other area" translators (providing service beyond the primary station's protected service area) only could be owned by independent parties, with the primary station absolutely barred from supporting, directly or indirectly, any such translator, before or after it commences operation;

* Off-air translator pickup of the primary station would be the general rule; microwave links only could be used to feed a "fill-in" translator; no satellite feeds would be allowed at all for commercial FM translators;

* Current translator "input power" limits would be replaced by limits on maximum "effective radiated power" (ERP). Maximum ERP for "fill-in" translators would be 1kW, provided that the translator's 1mV/m contour not exceed the primary station's protected contour (which often would require a lesser ERP level); maximum ERP for "other area" translators also limited to 1 kW, with a 16 kilometer limit on the radius of the translator 1 mV/m contour;

* New interference protection standards would be imposed to assure FM stations non-interference from translators; translators would be allowed to use directional antennas.

* The current rule limiting translator operation to 20 commercial FM channels would be eliminated, allowing translator operation on any FM channel.

* FCC seeks comment on whether there should be any "grandfathering of existing FM translators, the operation of which would not meet the revised rules; The FCC has chosen to extend its "freeze" on the acceptance of applications for new commercial translators (or major changes to existing commercial translators) for a period extending 60 days beyond the date when the Commission issues new rules for the FM translator service (such action could come from the FCC by the end of 1990).

NAB will be filing comments in this proceeding, supporting virtually all aspects of the Commission's Notice.

All broadcasters are urged to file their own comments as well. The deadline for filing comments is June 15, with a July 16 deadline set for the filing of "reply comments" (which can respond to the positions taken by other parties).

To file formal comments at the FCC, place "MM Docket No. 88-140" on the first page of your comments and send an "original" and five copies to: Secretary, FCC, 1919 M Street, N.W., Washington, DC, 20554.



Editor's Notebook



The first order of business for this month's column will have to be an apology to "db" magazine for saying that I didn't think it existed any longer. I was rudely awakened to the fact that it does indeed, exist when I saw it displayed at the NAB in Atlanta. In addition, a considerable number of readers pointed out to me that the magazine is still being published. I'd like to be able to blame it on "Murphy's Law" but unfortunately it was due to "Gordy's Carelessness".

As was expected, the big thing at NAB '90 was digital. Digital Workstations, Digital Audio Tape, etc., but the thing that really interested me was the Digital Audio Broadcasting (DAB) demonstration put on by the European Broadcast Union. This demonstration showed that you really can get CD audio quality in an over-the-air broadcast. I listened to a tape recording made in a moving vehicle in one of the European cities where a regular FM broadcast was A-B'd with a digital broadcast. "Picket-fencing" and background hiss were eliminated in the digital version. Granted, a totally workable system is still several years away, but it does show that there is something to work toward.

The reports I've heard indicate that the manufacturers of NRSC equipment did a booming business at NAB, something not unexpected with a June 30 deadline for compliance.

I had a discussion with Tom Keller of Broadcast Technology Partners and one of the designers of the FMX system and he feels that this could be the year when FMX really starts to take off now that the Bose controversy has pretty well died down.

My overall observations of NAB '90 are that while there were a lot of interesting things to see it's impossible to see them all, and while I have nothing against the city of Atlanta, Las Vegas is much easier to get around both inside and outside of the convention.

Finally, rumor has it that the FCC has come up with enough money to do

more field inspections. Some of the things they'll be looking for: Painted and lighted towers, adequate fencing and warning signs on the fences around the towers, PCB labels on capacitors which contain PCB's, and after June 30, NRSC compliance.

While painting towers and installing fences is a little out of our line, we here at Electronic Industries can supply signs, labels and NRSC equipment to bring you into compliance.

Gordy

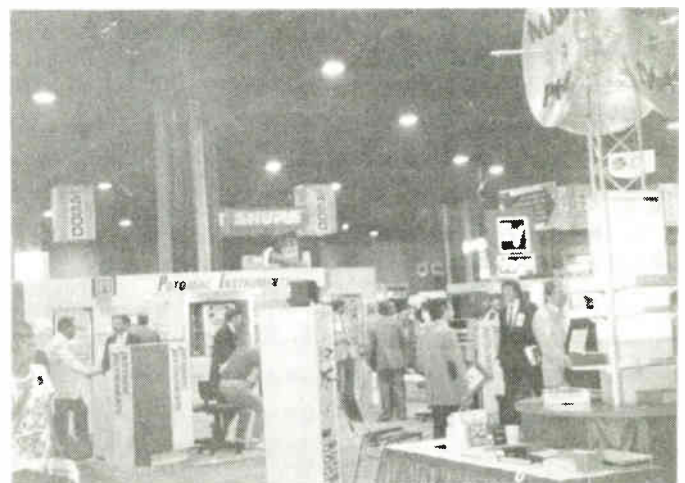
SBE Membership Increasing at Record Rates

The SBE membership increased more than 3% in the first quarter of 1990. At the 1990 SBE booth, in Atlanta, activity tripled over past shows. Other than membership and certification applications, the most popular items were the new certification computer software study guides and the new SBE certification pins.

SBE President Brad Dick attributes the increased growth and interest in SBE to the new member services and enhanced responsiveness to the members requests. The most popular member services include:

- The successful SBE convention.
- Ennes Education workshops
- SBE membership directory
- SBE medical insurance programs
- Presidents Newsletter
- Visa Cards
- Job Bank

NAB '90 Atlanta



AM Stations to Promote Receiver Certification

More than 850 AM stations have agreed to support the introduction of new high-quality AM receivers, by providing airplay of announcements to raise public awareness of the new products.

By late last week, 864 stations had agreed to run announcements to publicize a receiver certification mark being developed by NAB and the Electronic Industries Association (EIA), which represents receiver manufacturers.

The spots will be sent to stations when the new radios become available in retail stores, but pledges are needed now to assure manufacturers of our industry's support of the program.

The certification mark is designed to be placed on new receivers, possibly as soon as this year. Receivers bearing the mark will have superior fidelity because they will be built to the technical specifications of the NRSC standards and will complement NRSC-1 transmission. All AM stations, by FCC rule, must comply with NRSC-1 by June 30.

Most broadcast engineers believe that complying with the NRSC standards is the first step to improving the sound of AM radio. In California, an NRSC subcommittee of Chapter 47 of the Society of Broadcast Engineers has recently been formed with state-wide NRSC compliance in mind.

"We need to do something to save AM radio. This is a first and logical step, since it's rather inexpensive," says the group leader, Sandra Woodruff, a technician at KFWB-AM/Los Angeles. Woodruff estimates most stations can upgrade their sound processing equipment for between \$500-\$1,000 to comply with the NRSC standards.

The group intends to survey AM stations about NRSC compliance. The five members are convinced the standards are the first step to improving AM sound and will work to show others that they should make the switch.

Philips Previews High Quality AM Receivers at NAB Show

Philips Consumer Electronics Company previewed the first High Quality AM receivers at the National Association of Broadcasters Convention held March 31 through April 3.

The three Philips AM/FM/FM stereo receivers, models FR50, FR60 and FR70, comply with the new NRSC AM Broadcast Standards established by the FCC.

According to David Birch-Jones, marketing manager, audio separates. Philips brand, the new receivers provide improved high frequency response to

take advantage of the new high quality AM signal now being broadcast by AM stations around the country. The result is significantly improved voice and music reception in AM.

In addition, the AM spectrum range of these receivers is now from 520kHz to 1710kHz, an increase which will provide space on the dial for more new stations." Philips, the creator of the compact disc and the inventor of the audio cassette, is once again at the forefront of a new technology," remarked Birch-Jones. "There are millions of AM radio listeners in this country who deserve quality sound. These receivers will greatly increase the listening pleasure of that audience."

The popularly priced FR60 receiver was on display at the NAB AM NRSC display. All three receivers will be officially introduced at the 1990 Summer Consumer Electronics Show in June and will be available through Philips dealers later than month.

Oct. 1 Deadline for PCB Transformers

If you have been waiting for the EPA to drop another legislative bomb on PCB transformers, consider the first of October to be D-Day. On this date stricter regulations of PCB transformers will go into effect.

The Environmental Protection Agency describes toxic PCB transformers as those containing more than 500 parts per million of PCBs. If you have a PCB transformer, current codes stipulate that you mark all access to the transformer with an "ML", register the transformer with the local fire department and building owner, and report all fire-related incidents near the transformer to the National Response Center.

The new regulations going into effect on October 1, 1990, will now prohibit the use of network PCB transformers with higher secondary voltages (480 volts and above, including 480/227 volts) in or near commercial buildings. The EPA defines commercial buildings as all types of buildings other than industrial facilities. Transformers removed from service in accordance with this new regulation must either be reclassified to PCB contaminated or nonPCB status, placed into storage for disposal, or disposed.

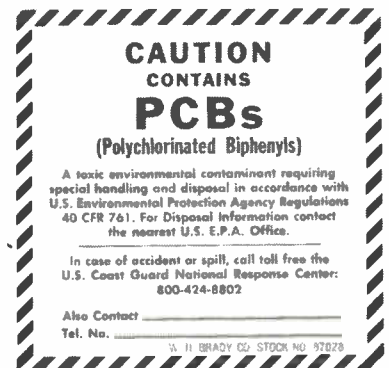
In addition, the new regulation states that all PCB transformers in use near or in a commercial building will require automatic detection and disabling devices to de-energize transformers should a high current or low current electrical fault occur. The type of sensor and disabling devices will depend on the type of transformers in use, ie, radial lower secondary voltage networks or



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Commission Receives Record 1,240 Emergency Broadcast System (EBS) Reports in 1989

One hundred and ninety broadcast stations reported 1,240 EBS activations for day-to-day emergencies affecting the safety of life and property in their communities in 1989. This is a record number of activations received by the Commission for one year. This brings to 10,493 the total number of activation reports received since 1976, when the FCC, the Federal Emergency Management Agency (FEMA), the National Weather Service (NWS), and the National Industry Advisory Committee, (now the Emergency Broadcast System Advisory Committee) started the EBS State and local program.

The Commission does not require broadcast stations to file a report when they activate the EBS, so the actual number of activations may be considerably more than the above numbers. Also, the FCC has received 321 reports since July, 1981, from stations who have activated the EBS at the request of state and local officials for nuclear power plant public notification tests.

The Commission commends broadcasters for their use of an organized system to disseminate emergency information. Broadcast stations, as the holders of a valuable public franchise,

have an obligation to serve in the public interest and the use of the EBS is an excellent example of fulfilling that obligation.

The 1,240 activation reports were received by the Commission since the issuance of the last EBS News Release on February 10, 1989. The reports submitted by the 190 stations cover situations such as: flash floods, tornadoes, severe thunderstorms, floods, blizzards, ice storms, power outages, high winds, a chemical explosion, a toxic spill and evacuation, a prison break and escape, a potential dam failure, a major telephone system outage, a toxic gas cloud and fire, Hurricanes Dean and Hugo, and the San Francisco earthquake.

Automotive Electronics Market to Reach \$8 Billion

The market for automotive electronic systems will grow from \$5.06 billion in 1989 to \$8 billion by 1994, according to a study by Frost & Sullivan.

Powertrain electronics, in both engine and transmission controls, will remain the largest market sector, reaching \$3.54 billion in 1994. Advances will involve dedicated systems

engineering rather than replacement of mechanical or electrical components and functions on a one-to-one basis.

Smart sensors, incorporating semiconductors, will increasingly be used to monitor, analyze and transmit engine data. Through the 1990s, not only will features such as distributorless ignition systems gain favor, but adaptive control of engine operation (to suit customer wants and needs), over the entire engine torque and speed range, will become the rule. The study takes note of the trend toward controlling engine and transmission electronically as one unit.

Major growth can be expected for antilock brake systems, to prevent skidding on icy or wet roads, and for traction systems. The study also predicts active suspension systems, in which a computer continuously controls the damping of chassis vibration without springs, will be in widespread use by mid-1990s. The total vehicle controls sector will reach \$2.1 billion by 1994.

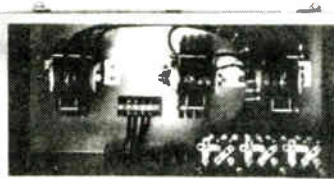
The driver-information market sector, which includes navigation systems, will rise to \$1.64 billion. The market for comfort, convenience and safety features, such as keyless ignition, collision-avoidance systems, remote start and fast defrosting, will total \$920 million by 1994, according to the study.

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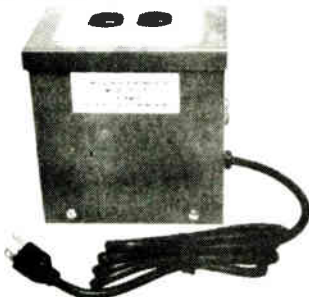
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'Buildingbridges' Study Examines Broadcaster-Cable Cooperation

"Building Bridges with Cable: A Survey of Local Cable Operators and MSO Executives," a study released during the annual convention of the National Association of Broadcasters, describes the links between broadcasters and cable operations on the local level.

The study, commissioned by NAB and the National Association of Public Television Stations and endorsed by the National Cable Television Association, was released in conjunction with the session, "Building Bridges with Cable."

The survey of 20 cable multiple system operators (MSO) executives and 200 system operators was conducted in December 1989 and examines discussions between broadcasters and cable operators on areas such as carriage, channel position, and syndicated exclusivity (syndex). In addition, the study assesses both current and potential joint ventures in programming, production, public service and other areas.

The study finds that 55 per cent of cable operators report having met with radio and television broadcasters within the past six months. The topics most frequently mentioned at these meetings are syndex, advertising sales and the technical quality of broadcast signals, followed by cross-promotion and carriage on cable systems.

Findings indicate that the most common joint ventures currently underway are jointly sponsored community events. The next most frequent broadcast-cable joint ventures are cross promotions of programming, producing radio-cable simulcasts and producing commercial spots for inserts. Other joint ventures include the production of local sports programming, special ad supported entertainment or informational local program, and local public affairs shows for cablecasting. Cable operators report a high degree of satisfaction with the joint ventures currently underway with broadcasters.

About two-thirds of the cable operators not involved in joint ventures are interested in getting involved with broadcasters. Sponsoring community events is the most popular prospect for these operators. More than half the cable operators are interested in joint venturing to produce local sports programming, to cross-promote cable and broadcast programming, and to produce local public affairs shows for cablecasting.

Over two-thirds of the cable operators have been approached by broadcasters to discuss syndex issues. While half of the operators anticipate some type of negative impact from syndex, 41 per cent indicate they expect no impact from syndex. Most cable operators

think broadcasters could help them by providing advance notice of program protection requests (particularly when a consistent form is adopted by broadcasters) and program schedules. Periodic reminders of which programs are protected is cited as desirable. A third of the cable operators said broadcasters could also help by providing alternative program feeds to replace protected programming blocks.

MSO executives basically reinforce the responses provided by the local operators; however, their interest in joint ventures is much more oriented to news programming. The kinds of potential joint ventures in which MSO executives are most interested include producing entire news programs, rebroadcasting local television newscasts, developing regional news channels and producing local news segments for insertion between other cable programming segments.

Decision-making at the MSO level is

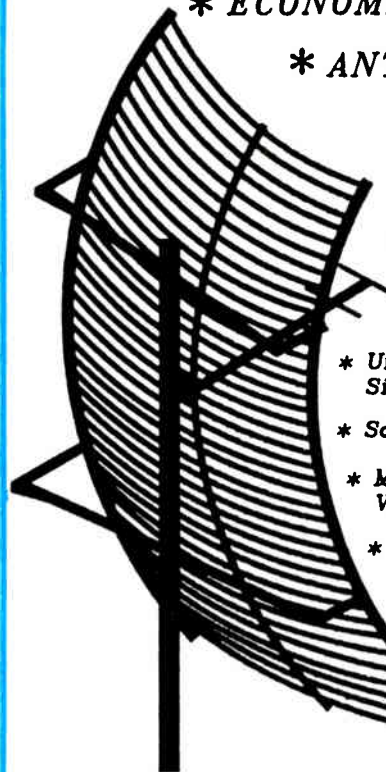
complicated, often involving five or more people. However, the majority of MSO executives report that their local cable operators either are solely responsible for decisions or share the responsibility with the corporate office. Local system managers have the greatest autonomy in areas such as cooperative efforts with local public stations in membership drives and program underwriting, trade-outs, cross-promotion, rebroadcast of radio stations, channel position of broadcast stations and advertising sales. There is more corporate involvement in areas such as audience surveys, syndex and carriage of broadcast signals.

Copies of the study are available for \$25 each. Contact NAB at (800) 368-5644.

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Broadcasters Object To Relocation Of Alabama Radio Station To Atlanta Area

The National Association of Broadcasters has urged federal regulators to reject a broadcast group's proposal to move an Alabama FM radio station to a suburb near Atlanta, GA.

In its filing before the Federal Communications Commission (FCC), NAB asked commissioners to reject the proposal submitted by station owner, Emerald Broadcasting. Emerald wants to relocate WHMA-FM in Anniston, AL, and move it to Sandy Springs, GA, a suburb near Atlanta. Atlanta is this nation's 12th largest media market.

NAB argues Emerald's proposal represents nothing more than a thinly veiled effort to subvert Communications Act requirements, and relocate a radio station to a much larger market. In its proposal, Emerald characterized its move as a simple relocation of transmission facilities.

In its comments, NAB said the proposed 90-mile move would take away the only FM station providing service to Anniston, a community with 30,000 residents. NAB said Emerald's request "seems hardly consistent" with the "ideals of localism." Instead, NAB said, Emerald's proposal "represents nothing more than attempt...to increase the au-

dience size of its station at the expense of the community it was originally licensed to serve."

NAB also said the Emerald proposal would undermine Section 307(b) of the Communications Act, which mandates "fair, efficient, equitable distribution" of broadcast outlets.

In supplemental comments filed, NAB asked the FCC to close this loophole. "The Commission must close the gates before local service is swept away."

FCC Imposes AM Freeze

In anticipation of a major overhaul and expansion of the AM band, the FCC imposed a freeze, effective April 5, on applications for new AM stations and modifications to existing stations.

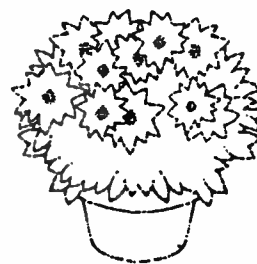
"This step is essential so that we may avoid compounding present difficulties with a continuing flow of new assignments based upon existing, possibly inadequate, standards," the FCC's two-page freeze order said.

At its April 12 meeting the commission is expected to launch a catch-all rulemaking aimed at improving the medium by cleaning up interference in the band. With the goal of AM improvement, it will also determine how to divvy up the 10 channels in the expanded AM band (1605-1705khz),

which, by international agreement, becomes available this summer. Some have proposed uncluttering the existing band by moving some stations into the expanded band.

According to the Mass Media Bureau's Larry Olson, the AM rulemaking will also encompass several proceedings proposing changes in the way AM signals are described and measured. "It's going to be a very broad, very comprehensive proceeding, another step toward resolving some of the problems of AM."

There are exceptions to the freeze. The FCC will accept applications for new stations filed in renewal challenges, applications filed in response to other applications filled prior to April 5 and applications for "minor changes necessitated by causes beyond the control of the applicant."



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Engineers Concerned About Safety and Environment

The need to balance safety and environmental concerns with the needs of radio and television broadcasters was addressed in an Engineering Conference session at NAB '90.

Richard Tell, Richard Tell Associates, Las Vegas, NV, discussed the problem of determining compliance with FCC RF radiation guidelines in the presence of RF hot spot fields. Such hot spots occur whenever ambient RF fields expose objects which are conductive, leading to production of electric and magnetic fields.

Tell summarized the results of a study that calculated and measured the source and strength of hot spots, and suggested that "contact current measurements appear the only practical avenue of evaluating RF hot spots found in public environments where ambient field levels are usually well within RF protection guides but local fields are apparently excessive."

Robert Leonard, Andrew Corp., Orland Park, IL, addressed tight governmental regulations for fire resistance and fire gas toxicity for indoor installation of coaxial cable and elliptical waveguide. He summarized several tests that have resulted in more restrictive guidelines, and predicted that future building codes covering cable installation undoubtedly would be even stricter.

The challenges of maintaining the weekly Emergency Broadcast System (EBS) test in today's world of competitive programming was discussed by Larry Estlack, Michigan Emergency Communications, Lansing, MI. Estlack explained that the length of the Emergency Broadcast System test tone is becoming increasingly annoying to broadcast programmers, many of whom feel that a test tone of 20-25 seconds induces audience to tune to another station.

To counter this perceived disadvantage, a recent test of the Michigan EBS explored the possibility of shortening the tone to eight seconds. The result: There seems to be "no detrimental effect on the system's reliability despite variations in musical formats, whether the monitored station is an AM or FM, or reception is local versus distant," Estlack said.

The session also featured:

* An explanation by NAB staff engineer Kelly Williams of how and why home appliances and electronic equipment create interference to broadcasting. Williams also outlined work currently underway to reduce this interference.

* A history of EBS, and a look at current EBS obligations and responsibilities of broadcasters during disasters, presented by Emergency Communications Systems consultant Ray Seddon.

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The SPH-5E provides superb telephone audio for your on-air calls and interviews. This unit's advanced analog circuitry provides the best null available in analog hybrids, keeping feedback and hollow sounding audio out of your operation. When used as a frequency extender, the SPH-5E recovers low audio frequencies that are normally lost on phone lines. This improves the bass

response of your remotes, making your announcers sound more natural on-air.*

Extra features for easy operation.

The SPH-5E was designed with simple operation in mind. You can talk with callers on-air and off-air with equal ease. The unit's CUE function toggles send audio between console mix-minus and your mic preamp. This allows you to talk to callers easily, without reconfiguring your console each time you take a call.

This feature makes it simple to set up your remotes. You can talk back and forth with the remote site off-air right until air time. Then, at the press of a button, you're sending mix-minus audio and the remote is on the air. If your console has a caller module, this process can be automated. The console will switch the send audio for you, based on whether the module is on or off.

Recording calls is easy too.

To record telephone calls, either on-air or off-air, press the SPH-5E's REC button. The unit will send both sides of the call to your tape machine, automatically starting and stopping the recorder.

No matter what the telephone requirement, the SPH-5E can give you the audio quality you want...within your budget. For ordering information, contact your favorite dealer or call Gentner at (801) 975-7200.

*A frequency extender is required on each end of the phone line. Gentner has a full line of extenders, including self-contained remote units. Call our Sales Department for details.

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The SPH-5 matches every broadcast application.

The SPH-5 is ideal for your broadcast on-air studio or newsroom. You can talk with

callers on-air and off-air with equal ease by using the unit's CUE button. When you push this button, the SPH-5 sends audio from your mic preamp down the phone line, giving you an easy, hands-free way to talk to a caller or a field news reporter off-air. Then, when you're ready to go on-air with the caller, just press the CUE button again. The SPH-5 switches back to the mix-minus feed.

If your console has a caller module, this process can be automated! The console will switch the send audio for you, depending on whether the module is on or off.

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MEMO FROM METZ



by
David L. Metz

Odds, Ends and Little Details Part IV

One thing just leads to another! In my last column on electroplating, I mentioned silver and lead free soldering. My proof reader Elmo, immediately asked "Now what's that, and how do you do it?" Quickly followed by "Where do you come up with all this stuff?"

Radio soldering is commonly called soft soldering. All (or most) soft solders are a 60/40 alloy of tin and lead. There are two other types of "solder" that are quite useful to the electronic builder, "hard" and "bright" solders.

Hard solder is commonly called silver solder since it contains silver in its alloy and no lead. Naturally it is much more expensive than ordinary soft solder. The metal to metal joints it makes are vastly stronger than soft solders. It also melts at a much higher temperatures (1,150 degrees F.).

I use hard soldering for the permanent assembly of small mechanical components. You can join a wide variety of metals with hard solder including stainless steel (this is the original reason I learned to use it). The case I have in mind here is a small UHF cavity resonator made of brass that I planned to silver plate. I could have used soft solder, but lead content solder does not plate very well.

Most hard soldering is done with a small tipped acetylene torch since you have to get the work piece to red heat. For small shop work I use a propane "turbo" torch. For some larger pieces I have used two torches on opposite sides of the work piece. You only need enough heat to make the solder flow, remember that! I have gotten too ambitious and melted my work piece!

Hard solder requires the use of special very vigorous fluxes. Most hard solder fluxes are white mixtures of fluoride compounds and borax. They are supplied as dry powders or wet pastes. There is also a new water clear "Gel Flux" available from jewelry supply firms. I've used both and like the Gel better even though it is not as active as the older type fluxes.

Make sure the parts you wish to join have a tight mechanical fit. Hard solder is not a gap filler like soft solder. I have

an old chunk of fire brick that I use to set the pieces on I'm soldering. That prevents a lot of fires on the work bench! Some small steel clamps to hold the pieces together are a great help too. Once you have your work pieces clean and free of surface rust, dirt or oxide you need to flux it. Use lots of flux, cover the entire piece. The flux not only removes the oxide to enable the solder to flow, it also prevents oxidation of your work from the intense heat of hard soldering.

Hard solder comes in two forms. For dab on soldering like you use for electronic work, hard solder comes as thin very springy wire. The other method uses thin sheets of hard solder placed between the adjoining surfaces of the work pieces. For that method, the solder comes in thin ribbons. A piece of the required size is cut with scissors and just sandwiched in before soldering. Note that often you use much less than you would first guess.

After the solder joint is made, you might want to "pickle it" to remove the oxide and flux residue. "Pickle" is a solution of mild acid. The work piece is dropped into it while it is still hot. The boiling action along with the acid will make the piece clean and bright.

As I said before silver hard solder is quite expensive. I have found one brand that does a fantastic job at a reasonable price. It's Silvaloy 355 56 percent silver alloy solder. I get mine from Brownells, Inc. a gun smith supply company (lots of neat tools in their catalog). Their phone number is 1-515-623-5401. Address is Route 2, Box 1, Montezuma, Iowa 50171. Note that the price varies a little with the silver market.

They also have an excellent "bright" soft solder called "High-Force 44." This is a 96 percent tin, 4 percent silver alloy soft solder that you can use with a electric gun. It works terrific with stainless steel, steel and brass. It is much stronger than ordinary tin lead solder and stays bright after clean up.

I use it on small objects and anything that can not survive the red heat of hard soldering. One advantage is that it will take copper and silver plating well where lead bearing solders will not. This is very important for the assembly of devices you plan to plate for corrosion protection or low RF resistance.

You use a totally different flux with "bright" solder. Brownells recommends their "No. 4 Comet" liquid flux. This stuff has an acid base so be warned. You don't need much and it makes a good clean joint with little residue.

Brownells also has an interesting LOW temperature solder. Called "Tix" this stuff is a soft solder based on an Indium alloy. It melts at only 275 degrees F. and surprisingly is stronger than ordinary tin lead solder. I've never needed anything like it yet, but then who knows what we'll need next?

In my last column I mentioned a silver polish called "Semichrome." This pink paste works great. It comes in small tubes and I find mine at a local motorcycle shop. You can also buy it from jewelry supply houses.

I hope you pick up a little lesson here. There are all kinds of exciting tools and shop techniques available to us. You just have to keep your eyes open for them. I found an old Brownells catalog laying in a box at a friend's house. That's where I learned about silver solder. The rest I found out about after wandering into a "rock shop" that sold jewelers supplies and tools to all the jewelry stores in our area.

There is hardly a week that goes by where I don't use some tool or technique that I got from one of those two and neither had anything to do with electronics at first glance.

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Raleigh Stations Build Joint Tower

The parent companies of the two stations whose towers collapsed in a pre-winter storm have formed a cooperative venture to build a 2,000 foot transmitter tower on a site near where both companies lost their towers.

Both parent companies will build separate transmitter buildings near the new tower site. The target date for the tower completion is Sept. 11, the beginning of network television's fall season.

The two companies have contracted with Kline Towers, Inc. of Columbia, SC to erect the tower, which will be heavier and sturdier than either of its predecessors.

"As construction and land costs rise, this sort of collaborative effort between competitors is becoming less and less unusual," said Jim Goodman, president of Capitol Broadcasting.

"Establishing an effective working relationship on such a massive project is certainly a challenge.

NAB Study Explores New Broadcasting Technologies

The National Association of Broadcasters has released a new study which examines the sweeping changes in broadcast technology.

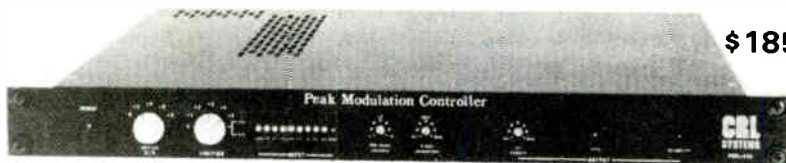
The new study, Spectrum of New Broadcast/Media Technologies: Technological Developments Impacting Broadcasting Markets, Businesses and Operations, analyzes technologies affecting the radio and TV marketplace today.

From camcorders, cellular phones, and interactive TV to digital audio tapes, cable TV, and direct broadcasting systems (DBS), the NAB book is a new state-of-the-industry report. The study also looks at promising new technologies such as Radio Data Systems (RDS) as well as lower power TV, satellites and videotex.

Providing a looking glass view at broadcasting's future, the NAB analysis reviews new developments in advanced television and high definition TV, and also discusses new directions in the video display market and projected costs for flat-panel TV.

Emerging video competition from America's telephone companies also is explored as well as new U.S. efforts to provide digital audio broadcasting, the CD-quality sound that can be delivered over the air by radio stations today. The study costs \$20; \$40 for non-members.

NRSC Conversion Products from CRL



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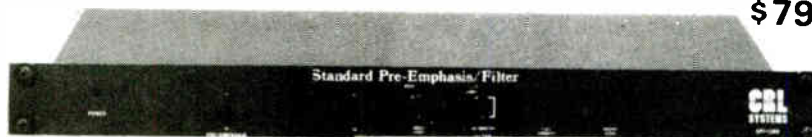
The CRL PMC-450 Tri-band peak modulation controller incorporates many unique designs originally developed for AM stereo. This unit offers state-of-the-art circuitry coupled with precise implementation of the NRSC standards for the loudest, cleanest signal on the AM dial. The PMC-450 consists of a powerful input compressor, followed by a tri-band limiter section and NRSC compliant low-pass filter. The flexible design of the PMC-450 allows it to be used as a stand alone processor, or in conjunction with various audio AGC's and pre-processors.



\$2495⁰⁰

SMP-950 Tri-Band AM Stereo Matrix Processor

The CRLSMP-950 Tri-band AM STEREO MATRIX PROCESSOR offers state-of-the-art circuitry coupled with precise implementation of the NRSC standards for the loudest, cleanest signal on the AM dial. AM Stereo is quite different from FM and requires special techniques to provide full stereophonic fidelity while maintaining full monophonic compatibility. The CRL patented matrix processing circuitry is designed specially to meet this criteria.



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SPF-300 Standard Pre-Emphasis/Filter for AM Broadcast Transmission

The CRL Standard Pre-Emphasis/Filter contains all the functions necessary to convert virtually any monaural audio processing chain to meet the NRSC (National Radio Systems Committee) Voluntary National Standard of January 10, 1987. This transmission standard defines specific pre-emphasis and filtering requirements which are intended to help solve many of the technical concerns in AM broadcasting. The pre-emphasis curve was developed to allow receiver manufacturers to employ a complementary de-emphasis characteristic in wide-band radios while improving the frequency response of narrower and medium-bandwidth radios. The filter specification, which limits transmitted audio bandwidth to 10 kHz, is intended to greatly reduce much of the interference between stations by reducing the conditions that cause "splatter" effects.

MDF-400
\$549⁰⁰

MDF-800
\$695⁰⁰



MDF-400/800 De-Emphasis/Filter for AM Monitors

The CRL Monitor De-Emphasis/Filter provides all the functions required to update any AM modulation monitor or wideband monitor receiver for the recently approved voluntary transmission standard. This allows easier setup of audio processing equipment by emulating the audio characteristic of the best-possible commercially produced radios. Additionally, the unit has features which can reduce interference typically heard in the station air monitor.

plus shipping & handling

International Standard Is - 1 Priority for HDTV Success

A panel of market development authorities from government and industry debated the variety and scope of market openings for HDTV at the "HDTV Market Developments and Opportunities" session.

Moderated by NAB's Michael Rau, the panel included Bradley Holmes, U.S. Coordinator and Director, Bureau of International Communications and Information Policy, U.S. Department of State; Howard Miller, Public Broadcasting Service; Gerald Robinson, Scientific Atlanta; Gary Shapiro, Electronic Industries Association; Lawrence Thorpe, Sony Advance systems; and Dr. Robin Willcourt.

"The Bureau is currently dealing with all three elements of the HDTV chain: production/program exchange, transmission and distribution, and consumer display devices, Holmes said. "But the focus over the past three years has been...to adopt a single, worldwide standard." He noted that this past week all the nations participating in the meeting of the CCIR's HDTV Working Party had agreed on precise definitions related to color presentations.

"There are approximately 34 specific video parameters which define a televi-

sion picture, and unanimous world agreement has been reached on all essential elements except the number of lines to be displayed and the picture repetition rate," Holmes said. Admitting that the final two parameters "are probably the most difficult to resolve," he argued that "if we can reach agreement on all but these two, then it's worth heading into the next study cycle."

According to Holmes, the Bureau's position in the '90s will follow four directives: 1) continue to rely heavily on the private sector for recommendations on HDTV standards; 2) pursue incremental progress on adoption of a single HDTV production standard; 3) U.S. CCIR policy will reflect the Bureau's best judgement on HDTV; 4) review the production standard issue in context of overall advanced television policy in the U.S.

PBS' Howard Miller followed with a push for what he called "low definition television."

"Our task at PBS is to develop affordable alternatives for our affiliates," he said, noting that the costs connected with HDTV "are totally unrealistic for the majority of local stations." He suggested the development of "synthesized HDTV" that would feature more affordable inputs and less costly equipment. He also mentioned that the construction of regional HDTV production centers were a possibility.

Gerald Robinson showed the audience a number of HDTV projects that Scientific Atlanta had already produced in the areas of corporate communications, closed circuit presentations and video theaters. "The market opportunities exist today," he said, "and will continue to grow steadily over time."

EIA's Gary Shapiro agreed. "HDTV is real. It's coming. And it's important for broadcasters to focus on," he said, pointing out that HDTV will appeal to high-end consumers, "the ones advertisers want to reach."

Lawrence Thorpe warned that HDTV's high-end appeal may remain too high for even well-wheeled consumers. "When HDTV came out, its cost was 2.7 times higher than the cost of standard broadcast studio prices," he said. "The second generation is 3.3 times higher." He noted that price will go down with increased volume.

The final speaker was Robin Willcourt, MD, an Australian physician, who according to Rau, "is one of the spiritual driving forces for use of HDTV in medical imaging."

"Medicine is very visually oriented," he said, adding that HDTV's 16-by-9 aspect ratio "helps a doctor get a visual orientation" much better than the conventional -by-3 ratio. He also suggested the use of HDTV for pathology and "medical faxing."



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NRSC-PR Connects between your compressor and limiter to provide NRSC pre-emphasis to your transmission system.

NRSC-FL Connects between your limiter output and transmitter audio input to provide POSITIVE control of required "Stopband" emissions.

NRSC-DM Connects between your modulation monitor (or monitor receiver) and your console/studio monitor to give "flat", de-emphasized audio into your monitors, plus with our deemphasis module, you get a tuneable 10 KHz notch filter to remove the "whine" from your monitors (frequently a very annoying problem during nighttime hours.)

The Bonus- "A Guide to NRSC Requirements." A complete bound booklet that takes the mystery out of the requirements. This guide provides a step-by-step explanation of the NRSC guidelines, and the FCC requirements. This is an invaluable manual that no AM station should be without (Available only in NRSC packages "A" and "B" - Not available separately.)

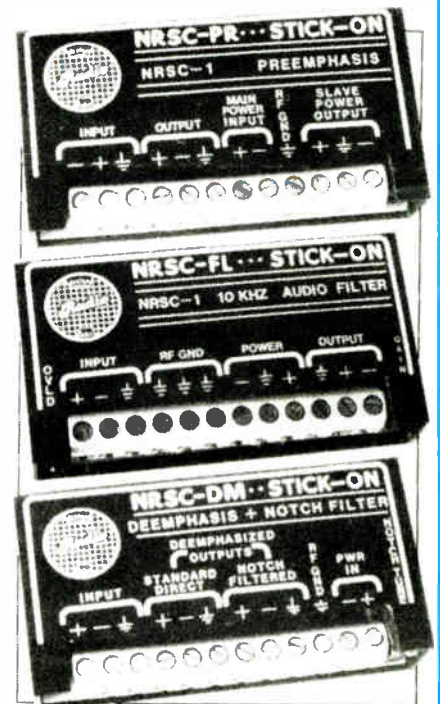
For convenience, these products are available in two packages:

NRSC "A" Compliance Kit - Includes NRSC-PR, NRSC-FL, and the "Guide to NRSC Requirements." This is the ultimate "compliance kit" to fulfill the requirements. Price \$399.00.

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The FCC has indicated that the use of warning signs is an important element of broadcasters' compliance with FCC rules on RF Radiation made of durable aluminum. The sign is printed in black and yellow on a white background and uses the standard symbol and colors for non-ionizing radiation, developed by the American National Standards Institute (as pictured).

Signs can be used in appropriate situations to adequately restrict public and worker's access to areas with high levels of RF energy. The sign can be easily mounted by using the six holes drilled along its border.



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How many times have pranksters climbed your station's tower or satellite dish fences? You can discourage this practice by displaying the *Danger/High Voltage Sign*.

The sign is made of durable aluminum. Printed in black and red, it can be easily mounted on your broadcast equipment fences using the six holes drilled along the top and bottom of the sign.

New Technology Allows Better Radio Reception For East Bay Residents

Radio station K101 is now being heard loud and clear by listeners in many of the previously hard-to-reach areas of Contra Costa County. Thanks to a new broadcast technology, radio listeners in Concord, Walnut Creek, Alamo, Danville and parts of Dublin are experiencing significantly better reception of the San Francisco-based radio station which features such well-known on-air personalities as Terry McGovern (Monday-Saturday from 5:30 a.m. to 10 a.m.).

"Our transmission to the East Bay is 100 percent better today," says Chief Engineer John Buckham for K101 (101.3 FM). "Since the station started 30 years ago, we have sought ways to satisfactorily boost our signal beyond the terrain barriers of the East Bay hills and Mt. Diablo. Now with this new technology, we have finally licked the problem."

That technology is a new synchronous transmission booster recently developed by a Silicon Valley broadcast equipment manufacturer-TFT, Inc. The TFT booster works in conjunction with K101's main transmitter in San Bruno and an on-frequency booster atop Mt. Diablo to deliver a crisper and clearer signal to the Walnut Creek and Tri-Valley areas. "I'm sure our competitors will eventually adopt this technology," adds Buckham.

Indeed, several other stations have shown an interest in the new synchronous booster called the "Reciter." But TFT executives report that K101 has at least a six month jump on their competitors by having installed the unit for early product evaluation. "We never had any doubts about the success of the Reciter, but we are ecstatic that K101's evaluation was so impressive," says TFT founder and president Joseph Wu.

For K101, being an innovator in the broadcast industry is nothing new. The station was one of the first to broadcast in stereo in the 60s and to later offer quadraphonic sound when it was popular in the 70s. The station's format is adult contemporary music targeted at listeners between 25 and 54 years of age.

Digital Audio Broadcasting Is Wave of Future, Engineers Told

Digital audio broadcasting and storage techniques highlighted the opening of NAB 90's Engineering Conference. The conference, covered presentations and discussions covering a wide range of radio, television, audio, graphics and environmental issues.

Michael Rau, NAB Senior VP/Science and Technology, told attendees that "the engineering world is changing perhaps faster today than at any time in the past." Foremost among this change is the rapid advancement of digital audio tape (DAT) and digital audio broadcasting (DAB).

This new technology, with which European broadcasters have recently begun experimenting, Rau said. "I need not tell you that if (DAB) develops in Europe, then once again the U.S. likely could be left behind in advances in broadcast technology. The Europeans already have a three-to-five year head start on the U.S.," he warned.

D. Pommier, CCETT, France, discussed a hybrid satellite/terrestrial approach for digital audio broadcasting. "Digital audio techniques are expanding into the domestic consumer market, leading to wide public appreciation of high-quality stereophonic sound," Pommier said.

Pommier described a system that broadcasts direct digital stereo audio to home, portable, and mobile receivers. This system incorporates techniques that perform bitrate reduction, allowing 12-16 programs in 6 MHz total bandwidth.

Kent Malinowski, Scientific Atlanta, Atlanta, addressed the future of satellite delivered digital audio. He summarized the research already conducted to assess current digital usage, as well as further needs for satellite-delivered audio.

One vital element of eventual full digital audio broadcasting is digital audio processing of remote feeds. Paul Donahue, Gannett Radio, Los Angeles, discussed this issue by looking at digital audio bit rate reduction, digital telco networks, VSAT satellite systems, and high speed modems. These systems "recently have converged to permit high quality audio remote broadcasting (that) can now be cost-effective for 7.5 kHz to kHz bi-directional remote broadcasts," Donahue said.

Tony Masiello, Radio Division, New York, demonstrated a telephone network-connected ISDN audio system, which provides a high quality link for remote broadcast feeds. Masiello discussed the application of digital signal processing in these remote systems, which perform a data bit reduction operation necessary to make the system

cost-effective.

Other digital audio systems/techniques discussed include:

- * A method for using commonly-available S-VHS recorders to store digital audio;

- * Low-cost digital audio, using a hard-disk product that stores up to two hours of program audio.

SBE Hosts International Meeting

Sergio Rojano Sahab the new president of the Mexican Engineering Association (A.M.I.T.R.A.), and Sergio Beristain the editor of their official publication (AMITRA) along with representatives from Canada, Wayne A. Stacey and Stephen L. Edwards, joined SBE president Brad Dick and Vice President Richard Farquhar for an early morning meeting at the 1990 NAB convention.


The three organizations were in agreement on the many problems fac-


ing our industry and what must be done to help solve them. There were several areas in which the organizations agreed to continue cooperative efforts.

- exchange membership
- certification information
- member services
- education and training for members
- industry regulation
- industry improvement and advancements
- exchange of member correspondence

SBE president Brad Dick will speak at the 13th A.M.I.T.R.A. convention on August 13, 1990, in Acapulco, Mexico.







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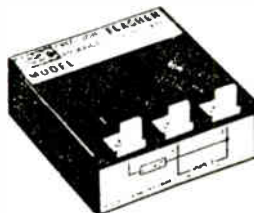
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- SMALL SIZE—2" x 2" x 3/4".

DESCRIPTION

SSAC totally SOLID STATE TOWER FLASHERS have proven reliability with years of use on Radio and TV towers throughout the country. Each of these controls are built to exacting specifications using only the highest quality electronic components. Design features such as zero voltage switching, inherent fail-safe, encapsulation and long life makes these devices superior to all others.

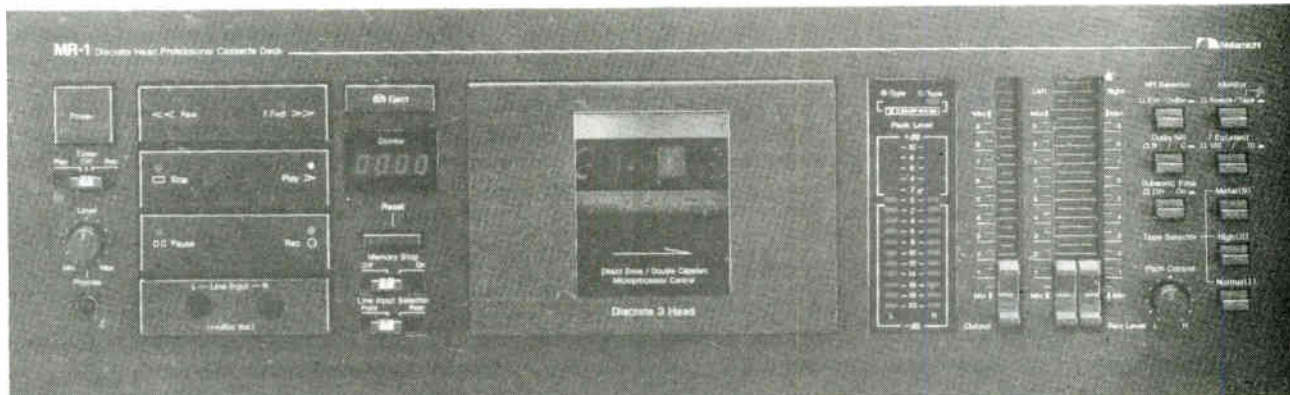
Professional Precision For The Professional Recordist The Nakamichi MR-1

Manufacturer's List Price

\$995.00

Call for Quotes

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Out-of-State: 800-558-0222 or
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Professional Features For True Professional Performance

- Nakamichi Discrete 3-Head Technology
- Asymmetrical Dual-Capstan Diffused Resonance Transport
- High Inertia Direct-Drive Capstan Motor With Wide Bandwidth FG Servo

- Low-Distortion Direct Coupled Electronics
- Balanced Inputs 1/2-Inch Front Panel XLH Rear Panel
- Unbalanced Inputs 1/2-Inch Rear Panel
- Line Input Selector Switch
- Outputs XLH Rear Panel (Balanced) 1/2-Inch Rear Panel (Unbalanced)
- Self-Contained Dolby-B and -C Noise Reduction

- Provision For External Noise Reduction Systems
- 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

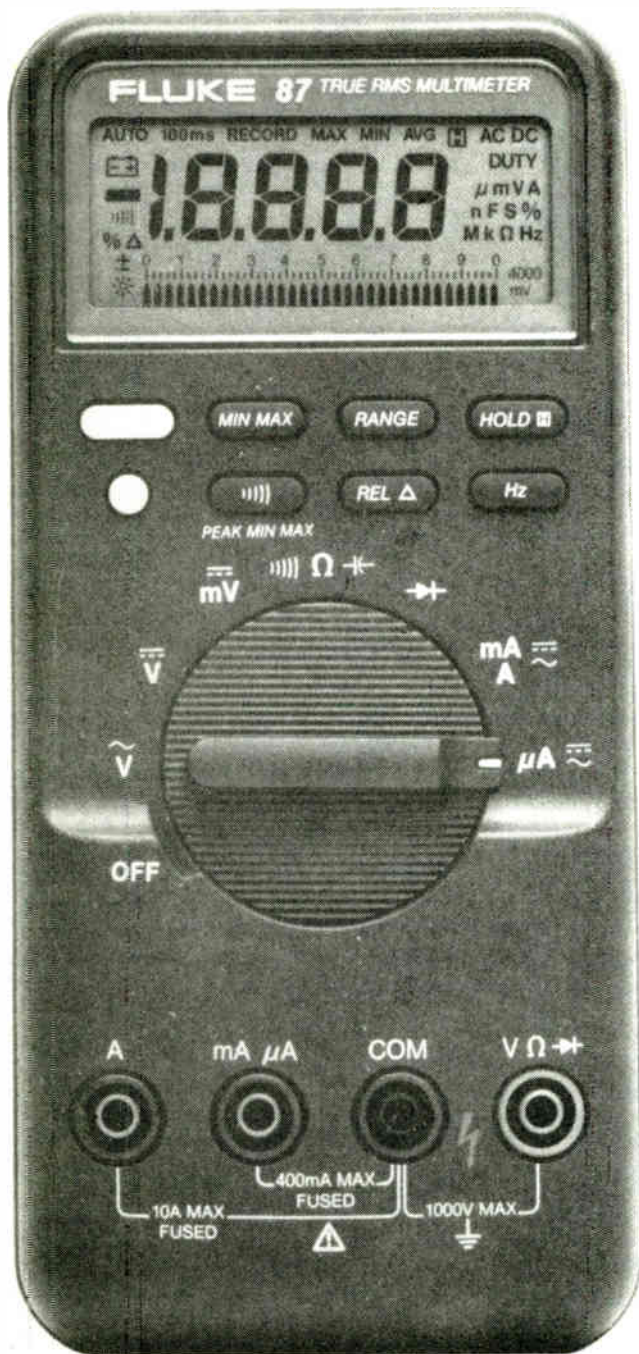
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80 Series

Analog/Digital Multimeters



Actual size

The new Fluke 80 Series (83, 85, and 87) is a high-performance family of handheld analog/digital multimeters with a powerful combination of measurement functions, including frequency, duty cycle and capacitance.

Designed for electronic as well as industrial applications, the 80 Series' durable construction and unique safety features ensure reliability and optimal performance in a variety of environmental settings.

- **MIN MAX AVERAGE recording mode with Min Max Alert™:** Simultaneously stores the highest, lowest, and average of all readings, allowing you to monitor a signal for seconds or days (average up to 36 hours). Selectable response times allow you to specify the time required to sense changes. Min Max Alert gives an audible tone for readings above or below previous minimums or maximums.
- **Frequency, Duty Cycle and Capacitance Measurements:** Fluke 80 Series meters have a counter for frequency measurements from 0.5 Hz to greater than 200 kHz, and duty cycle measurements from 0.1% to 99.9% of cycle. All three meters measure capacitance from 10 pF to 5 μ F. Larger value capacitors may be measured using the analog display in the resistance mode.
- **Input Alert™ and Overload Protection:** Input Alert provides an audible warning if the input jack connections are not correct for the measurement selected. This reduces the risk of damage to the equipment being tested and to the meter. Fluke 80 Series meters also provide 1,000 volt input protection in both ohms and diode test.
- **Fast 3¼-digit, 4000 count digital display, high resolution analog display:** Ensures greater accuracy and resolution. Digital display updates 4 times per second; to see changing or unstable signals, the analog display updates 40 times per second. The 87 features a high-resolution analog pointer; the 83 and 85 use an analog bargraph. The 83 and 85 also feature Zoom Mode for higher resolution analog readings.
- **4½ Digit Mode, 1 ms Peak Min Max hold, True RMS, Back-Lit Display (87 only):** The Fluke 87 is a true-rms meter, and offers a 4½ digit, 19,999 count high resolution mode (1 rdg/sec), plus 1 ms Peak Min Max hold. The back lit display assures readability in poorly lit settings. Light automatically shuts itself off after 68 seconds, prolonging battery life.
- **Touch Hold® and Relative Modes:** Touch Hold captures the measurement, beeps and locks it on the digital display until you're ready to view it. It automatically updates with each new measurement. The Relative Mode remembers a reading and shows the change (difference) between it and any readings that follow.
- **Rugged, Sealed Construction:** Splash proof and dust proof case and a specially designed protective holster protect the meter even under harsh operating conditions. All units are sealed and EMI shielded.

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