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COMMON POINT®

A MONTHLY NEWSLETTER FOR BROADCASTERS

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LEGISLATION INTRODUCED TO REQUIRE AN ENGINEER ON THE FCC

Representative Don Ritter (R. PA), has introduced legislation that would require at least one Commissioner on the Federal Communications Commission to be an engineer. Ritter made the announcement at the Society of Broadcast Engineers National Convention in Houston (held October 2-5). Ritter, the keynote speaker at the annual SBE closing banquet, drew a standing ovation from the more than 400 broadcast engineers present when he announced introduction of the bill.

Ritter told the gathering, "The FCC is charged with regulating one of the fastest growing and technologically dynamic industries in this country. Yet, since its creation in 1934, only eight of 64 Commissioners have had any kind of engineering background". Ritter noted that the Commissioners have professional staff assistants, but pointed out that "of the 15 professional staff assistants to the current FCC Commissioners...only one has a background in engineering.

Representative Ritter is a member of the Telecommunications Subcommittee of the Energy and Commerce Committee, and a member of the Science, Space and Technology Committee. Ritter himself is an engineer, holding—among other degrees—an Sc.D. from MIT.

In explaining his reasoning for the legislation, Ritter told the SBE members that requiring an experienced engineer on the Commission would, "give the FCC greater ability to handle the complex technical engineering questions that will be coming before the commission in the years to come".

Ritter's bill, H.R. 3501, would amend the Communications Act of 1934 to require that, "At least one Commissioner shall, by virtue of possessing at least a bachelor of science degree in any engineering discipline from an Accreditation Board for Engineering and Technology, approved educational institution, or by virtue of holding senior or fellow status in a nationally recognized engineering society, or by virtue of registration as a professional engineer, be skilled in the engineering sciences at the time of his or her appointment."

The SBE, which has been lobbying Congress for such legislation, welcomed the introduction of H.R. 3501. Dane Ericksen, an SBE Board member and chairman of the SBE FCC Liaison Committee, praised Ritter's efforts and promised, "a grass roots effort to ensure that Congressman Ritter's bill receives the wide support it deserves."

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1991 BROADCASTER'S CLINIC A SUCCESS

There were approximately 175 attendees at this year's Broadcaster's Clinic held at the Holiday Inn, Southeast in Madison, wisconsin. As usual Don Borchert and his staff put together a lineup of varied and talented people from the Radio and TV broadcast area. (See November Common Point for a listing of the speakers.)

Preliminary plans are already underway for a 1992 Clinic and tentatively scheduled for the second week in November.

George Werl, a communications consultant from St. Paul, Minnesota opened the sessions on Wed. Nov. 6 with a presentation describing the Shoreview 8 multiple station transmitting facility in the Twin City area. This was about a $4.5 million project which George worked on for about two years. Some of the more interesting facts about the installation are that there is an expanded metal screen under the building tied to a 6 inch ground strap. air flow is brought in around the edges of the building and exhausted from the middle, and there are two separate systems of air handling.

Incoming AC power consists of two separate 13.8 kilovolt feeds. The installation was designed for a load of 325 kilowatts and is presently only running at 130 kilowatts.

Transmitting antennas are mounted one 1400 foot tower and the amount of RF generated is approximately 1.6 million watts.

The individual transmitters are located upstairs in the transmitter building and the combiner located downstairs.

Monthly expenses to operate the facility are running about $17-$18k per month.

In the afternoon Don Markley, consulting engineer, gave us an overview of the new AM rules, stating that the former Class I stations are now Class A, Class II & III's ae now Class B, and can go up to 50 kw power in some cases. Class IV's are now Class C and the former daytime only are now Class D.

(Cont to pg. 3)

World Radio History

Editor's Notebook

GORDY DAILEY

This column is being written on the day after Thanksgiving, which means that by the time this issue of Common Point gets in the mail Christmas will only be a few days away. Of course that also means that the year, 1991, is about at an end, and so we do a little reflecting on what went on during the year.

The big news, of course, was the war in Iraq, better known as "Desert Storm", which was won by the UN forces in a matter of only 100 days. However, in light of some of the reports coming out since regarding the nuclear and chemical capabilities that Iraq has it appears the job may have only been half done.

On the economic side, it appears the country has been in and out of recession a couple of times, depending on which politician or economist you believe, and the broadcast industry has shared in the economic problems of other businesses. However, I guess you have to keep an optimistic outlook on things and while we may be feeling pinched right now, things are forecast to get better in 1992, and hopefully, the forecasters are right. If not, well 1992 is an election year and if our elected representatives aren't doing the job we have the opportunity to vote new people into office.

1992 will see some changes in the broadcast industry, especially in the AM end of the business. I won't go into any details here as these changes have pretty well covered recently in a number of publications.

Digital is still one of the by-words that is being kicked around, not only in the audio domain but also as it applies to over the air transmission for both radio and TV. At this point in time, however, it doesn't appear likely that there will be a mass exodus from the analog world to the digital in this immediate future.

In closing, I would like to take this opportunity, along with the rest of the staff and management of Electronic Industries, to thank you for your business during the past year and look forward to continuing our relationships during the coming year.

Have a safe and joyous Holiday Season and a successful 1992!

*****

HIGHLIGHTS OF NEW FCC AM RULES

On Oct. 25, the FCC released the full text of its Report and Order on AM Improvement. It is expected that the new rules will become effective early in 1992. The new rules will cover changes in both technical and non-technical areas. The changes are aimed mainly at reducing interference in the existing AM band and to ensure that operations in the new expanded AM band (1605-1705kHz) are initiated under high-quality technical standards and will provide wide-area interference free service.

The date that the new rules become effective will also be the date when the "freeze" imposed March 29, 1990, will end on the filing of most applications for new or changed AM facilities.

Following are some of the more significant points of the rules changes. For a complete text of the Report and Order contact the FCC and to find out the changes affect you get in touch with your consulting engineer or attorney.

The Commission says it soon will antain protection ratios in order to promote wide-band AM reception and to further encourage receiver manufacturers to market wide-band radios.

* No changes were made to the co-channel protection ratio. It remains 2dB.

* The first adjacent protection ratio has been changed from 0 dB to 6 dB. this ratio is applied at the normally-protected contour.

* The second adjacent channel protection ratio has been changed to 0 dB. Previously, overlap was permitted to the 2 mV/m and the 25 mV/m contours of second adjacent channel stations. The new rule prohibits overlap of the 5 mV/m contours of second adjacent channel stations.

* The third adjacent channel protection ratio remains unchanged at 0 dB. Overlap of the 25 mV/m contours is prohibited.

The FCC points out that when the latest Report and Order takes effect (ex-

(Cont. to pg. 7)

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Model RFC-1/B
Remote Facilities Controller

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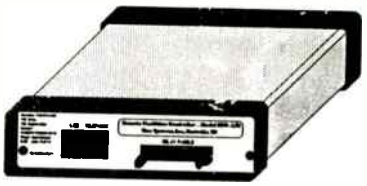

There are a number of excellent dial-up remote controls available today. However, most of them share two things in common: 1) they are fairly expensive and 2) they have a number of extra features, "bells and whistles," that many users do not need. To give the broadcaster an alternative, Sine Systems decided to develop the RFC-1. This decision occurred at the same time a new generation of microprocessors was becoming available which offered some very interesting possibilities for use in a remote control. The combination of our "No frills" design approach and the use of this microprocessor has resulted in a dial-up remote control which is ingeniously simple and very cost effective; yet it is a precision, high quality device, built to withstand many years of service.

Remote Facilities Controller, model RFC-1/B: $1099.00

Relay Panel, model RP-8 . . . $399.00

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The Zercom Telephone Hybrid is an interface for connecting a telephone line to a stuido console. It does not switch audio between send and receive, but instead provides full duplex (simultaneous two way audio) for best results. It is also known as two to four wire conversion. The hybrid sends audio to a telephone line and receives audio from the line. To make up for a telephone line's inherent 15 DB send to receive level difference, the Zercom Telephone Hybrid has a nulling circuit which is used to reduce the local send audio as heard back in its receive output.

Adjustable input and output gain controls are provided in the Zercom Telephone Hybrid to accomodate almost any situation. Audio inputs and outputs are active balanced. The telephone line tip and ring connection is set up for a direct DC line hold configuration or capacitor isolated to prevent DC flow through the hybrid's telephone line transformer. The choice is user selectable on the rear terminals.

There are two null controls on the Telephone Hybrid for reducing the audio input to output transfer.

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(Cont'd from pg. 1)

Stations in the new expanded band can have powers of 10KW days and 1KW night. Don also emphasized the fact that a ¼ wave tower in good physical condition with a good ground system will radiate the standard 194 mv½m @ mile regardless of whether it is a series fed, shunt fed or unipole antenna.

Mark Persons spoke on "Does Anyone Know how to tune AM & FM Transmitters?" He made a number of points including the use of the transmitter test data sheets which accompany all transmitters when they are shipped from the factory, and keep records of your own detailing adjustments and changes. You should be able to stay fairly close to test sheet data and if you find that things are getting way out of the ball park start checking until you find out why.

On Thursday evening the FCC panel, consisting of Al Jarratt, Phil Bradford and Garrett Lysiak updated us on what the FCC is doing and answered questions from the floor. It was stated that the likelihood of being inspected is not too great considering the size of the staff at the field offices and the number of other services that come under the jurisdiction of the field branch in addition to broadcast.

Increased emphasis is being placed on EBS. Considerable work is being done on updating state plans and making the system viable. The goal is to have a nationwide test of the system.

All tower light malfunctions must be reported to the FAA and also after the problem has been corrected. This includes such things as one lamp of a two lamp beacon being out.

Under remote control facilities, specifically dial up types, you must have an operator on duty at a fixed point who has absolute control over the transmitter. You must also have the ability to have five minute turn-a-round of EBS alerts, and operators must be properly instructed.

Inspections have revealed a low level of compliance on monitor point readings of DA's. Make sure the descriptions are accurate and up-to-date. Inspections have also turned up a number of public file violations.

They are also finding a number of violations of the chief operator requirements, i.e. inspection and calibration of transmission systems and monitors, including remote control and monitor point readings, and review of the station record weekly, making sure the logging requirements are met and sign the record.

If you've never attended one of the Broadcast Clinic's put it on your schedule for next year. You won't be sorry.

******

SCIENTIFIC-ATLANTA will ship its first video-compression-ready satellite receiver next March

and its first compression module the following fall. The Model 9708 integrated receiver-decoder (IRD) will be compatible with S-A's existing analog B-MAC encryptiontransmission technology; insertion of the compression module will fully digitize the system. Reiss Media has ordered the IRD to scramble one of its cable pay-per-view channels; HBO will use it to deliver the HBO Ole movie service to Latin America. At the Nov. 2022 Western Cable Show in Anaheim, Calif., S-A will also introduce the first elements of end-to-end 1 ghz cable equipment in development.

AMPEX will introduce a complete component digital production system at the International Broadcasting Convention in Amsterdam, July 27, 1992. The "DCT" system will include a proprietary 19 mm (threequarter-inch) VTR, metal particle tape and production switcher.

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World Radio History

NAB URGES FCC TO ADOPT MUST CARRY RULES

Fearing a television world of "haves and have-nots," the National Association of Broadcasters strongly urged the Federal Communications Commission (FCC) to adopt must carry rules so that consumers may be assured of long-term access to the broadcast television stations licensed to serve their communities.

In its comments, NAB cited several justifications for new must carry rules. First, the FCC's reliance on local broadcast stations to provide effective competition for cable in controlling its rates will be meaningless if cable continues to have the power to exclude or manipulate carriage of those stations. Second, without must carry rules, stations have no assurance of access to the local communities whose needs and interests they are mandated to serve. Third, must carry rules assure that cable subscribers will have continued access to diverse viewpoints and sources of information other than those chosen by the cable operator. Fourth, must carry would help restore competitive balance to a video marketplace in which cable and broadcasting vigorously compete for programming, viewers and advertising revenues, but where cable now has the ability to freely exploit carriage of local broadcast stations without any obligations to those stations.

As further evidence of the need for carriage rules, NAB demonstrated that competition between cable and broadcasters provided continued incentives for cable to drop, to refuse to carry or to reposition broadcast signals, or to extract concessions from broadcasters, and that cable continues to engage in such anticompetitive activities. NAB asserted that "if harm to broadcasting sufficient to justify signal carriage rules must wait until the Commission can point to hundreds of rusting, inactive television towers, it will be far too late for must carry rules or any other regulatory action to restore what the American people have lost."

Addressing the theory that A/B switches and antennas provide a suitable substitute for carriage rules, NAB submitted a study showing that only six percent of cable households report ever having used an A/B switch, despite a four year FCC requirement that cable systems offer such switches and educate subscribers about their use.

To help redress the competitive imbalance and assure the public policy benefits that are at risk without must carry, NAB proposed rules that would:

* generally require cable systems to devote up to one third of their channel capacity to the carriage of local stations in their Arbitron Area of dominant Influence (ADI), the most common measure of a television market;

* provide that all carried signals be carried in their entirety; that required signals be carried without material subscribers, and be viewable on all sets that the cable operator connects to its system;

* provide that stations carried under the rules have a choice of guaranteed channel positions; and

* prohibit a required signal from being dropped or repositioned during sweeps periods or without 30 days' notice.

NAB expressed confidence that the carriage rules it proposed, if properly supported with the evidence available to the FCC, and the justifications provided by NAB, would withstand constitutional challenge.

******

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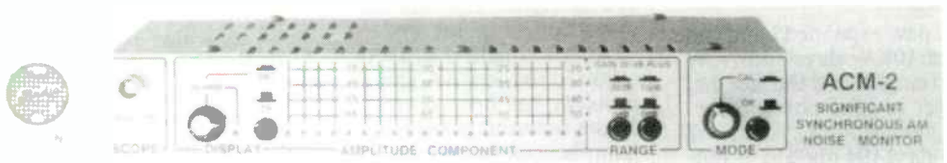

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- 4-times oversampling digital filter.
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- 20-track random access programming with 10-key pad.
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- Multi-function FL display with Music Matrix.
- Headphone jack with volume control.

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- Digital servo system offers improved playability.
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- Synchro Editing for linked operation with selected Technics cassette decks.
- CD editing functions: Peak Level Search, Time Fade, Auto Space, Edit Guide with Jus: Time Edit and Disc Link.
- Remote control with 10-key direct access.
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SBE/NPR TO OFFER TECHNICAL CERTIFICATION COURSE

The Society of Broadcast Engineers and National Public Radio have combined forces to offer an instructional certification course in broadcast technology. The NPR/SBE Course will be carried by NPR via closed-circuit satellite to its member stations in the winter of 1992. It will cover the SBE Broadcast Technologist certification level, as well as a review of the Broadcast and Senior Broadcast Engineer certification levels.

The ambitious project is designed to provide a library of fundamental engineering concepts and information for a wide variety of students.Each course will include a workbook, accompanying audio tapes,review exams, and live satellite interconnects with expert instructors.

The project is partially funded through a grant from the Corporation for Public Broadcasting's System Development Fund. (The price for SBE chapters is $150 per course, used to offset expenses incurred in preparing the program).

The NPR/SBE course will cover five important elements of radio station operation:

1. Electronic Theory, taught by Ed Montgomery, an electronics instructor in Fairfax county, VA.
2. Audio Theory and Practices, taught by Andy Laird, director of engineering for Heritage Media Corp.
3. AM/FM Radio Frequency Theory, taught by Jerry Whitaker, a technical writer based in Beaverton, OR.
4. Satellites and Microwave, taught by Wally Mamak of Andrew Corp. and Greg Monti of NPR.
5. FCC Rules and Regulations, taught by John Reiser of the FCC.

For information on the NPR/SBE certification course, contact Donna Fox at National Public Radio — 1-800-235-1212, extension 2737. or write to:

NPR Training —
SBE Certification Course
2025 M Street, N.W.
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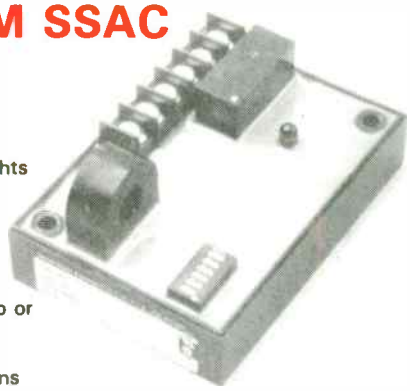

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The SCR430T is truly a Universal Alarm Relay. Six onboard switches allow direct operator programming of the desired application. Select from 1 to 4 lamps, beacons or sidelights. The toroid sensing allows for multiple feed through to arrive at different lamp wattages or the monitoring on more than one line.

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World Radio History

SBE CONVENTION ARTICLE

By M. W. Persons

The annual Society of Broadcast Engineers Convention in Houston, Texas on October 3—5th was a success. the total daily attendance was 3.367, with 151 manufacturers displaying. Convention ceremonies officially transferred the title of Society resident from Brad Dick to the newly elected Richard Farquhar. Among other things, Dick received a new pocket protector as a symbol of the broadcast engineering profession he represented. Fortunately, most engineers are working to erase the pocket protector image. Farquhar appears to be an energetic man with a history of working as a manager. This experience should prove useful in guiding the SBE through the future and in increasing SBE membership. Farquhar urged engineers to raise the level of the profession by saying "Let's sell SBE, let's sell quality."

The convention was preceded by a day of Ennes workshops. These excellent sessions covered subjects from transmitter maintenance to contract engineering.

The main convention had many good technical speakers with digital topping the list of subjects discussed. Someday, in the not too distance future, we will have all-digital radio stations. However, don't put off equipment updates how waiting for digital. We can't afford to let radio quality slip and have more listeners move over to consumer electronics like CD's. In fact, now is the time to improve and be as good as possible. Quality is extremely important, especially in the face of competition.

To the best of my knowledge, there are no all-digital studio consoles. It is unlikely there will be any soon, or at least until a digital data interface standard is established. Even after that happens, it will take time.

Digital STL's were of great interest to many. A demonstration by Moseley showed how their digital converter box can make a composite STL go further without loss of quality. They reduced receiver input level until noise made a standard STL unlistenable. Then they switched in the digital converter, on the same STL system, and the audio was perfect until the signal was down to a lower level yet when it abruptly quit working.

An interesting note here, the SBE Convention was about half radio and half television. NAB Conventions appear to be about ¼ radio and ¾ television. The atmosphere of the SBE Convention is friendly and easy to attend because it is smaller than NAB.

I look forward to the next SBE Convention in San Jose, California.

*****

FAST TRAC

by Henry Engineering

FAST TRAC is a self-contained automatic dubbing system that allows almost anyone to make flawless dubs without the need for a studio.

Broadcasters do lots of dubbing. Music and spots are dubbed to cart. Spec spots are dubbed to cassette. Interviews are dubbed to reel. Something always needs to be dubbed to something else.

Do you really need a 10-channel *mixing* console when you're not actually *mixing* anything? Of course not!

There must be a more efficient way to handle routine dubbing tasks. Now there is.

It's FAST TRAC

FAST TRAC has two important functions: to *dub* from one machine to another, and to *automate* the dubbing process.

A One-Pot Oubbing Console

FAST TRAC is essentially a four-input 'mini-board.' It operates just like a console, but with only one pot.

One Button Operation

The process of dubbing carts requires split-second timing. Doing this manually results in time wasted re-dubbing carts that are 'to loose' or 'too tight.' Consistency is nearly impossible when carts are dubbed by different people.

FAST TRAC solves the problem!

FAST TRAC *automates* the dubbing process with one-button simplicity. *All* dubs are tight and consistent. Time wasting re-dubs are a thing of the past!

When the Start button is pressed, both the source machine *and* the recorder start at the correct time to produce perfect results. FAST TRAC has timing adjustments for *each* source (e.g. turntable, CD player, reel deck). When the user selects the source, FAST TRAC *automatically* selects the preset timing. You get perfect dubs everytime with one-button simplicity.

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NEW FROM marantz
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PERFECT FOR ALL CRITICAL RECORDING SITUATIONS

Price $299.95

The PMD222 has all the features of the PMD221 with the very important addition of an XLR microphone input. Why is it important?

- The XLR input is a balanced input meaning it does a better job of rejecting radio frequency (RF) and electrical (such as that generated by florescent lights) interference which can spoil good recordings.

- The XLR input allows a user to lock in the microphone cable connection. With a miniplug microphone input, the cable is susceptible to being ripped out or snapped off, destroying the recording.

- The XLR input is a low impedance input. Low impedance signals are less susceptible to signal degradation and noise when traveling through the cable. Lower impedance means a stronger signal and cleaner recording.

- Three heads
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- Pause/play for live intro
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pected in early 1992), also becoming effective will be rules adopted in 1990 allowing the acceptance of "contingent applications," whereby station licensees could agree to reduce interference on the AM band by one or more stations choosing to reduce power to go off the air in exchange for payment by another station(s) that would thereby be allowed to increase facilities and service area(s).

Such agreements would, of course, be governed by the Commission's new technical interference standards aimed at reducing interference levels over time. No competing application would be allowed to challenge two or more stations' efforts to afford such consolidation through the filing of contingent applications.

The Commission says it soom will announce a "filing window" during which licensees of existing AM stations will be able to file "petitions for exclusive allotments" in the expanded band. (No filing fee will be required for such petitions.) Such allotments will be "exclusive" in that if a petitioner is selected for migration, an allotment will be made to the petitioner's community of license and only that petitioner will be eligible to apply for the frequency assignment.

The petition must include an accurate description of the existing band station (call sign, community of license and operating frequency) seeking to migrate and any additional information necessary to rank the station, such as an intention to operate in AM stereo. (A petitioner pledging to operate in AM stereo on the expanded band would enjoy a 10%AM Improvement factor adjustment" over an allotment proposal of a licensee not pledging to offer AM stereo service.

An official allotment plan then will be developed and published, allowing 30 days for the comments of all petitioners.Stations not selected for migration will be allowed, following this 30-day period, to file petitions for reconsideration. After the plan becomes final, petitioners selected for migration will be gien 60 days to file an application for a construction permit. The application should be filed on FCC Form 301 and must be accompanied by the normal filing fee.

After accepting the applications, the FCC will put them on a cut-off list, making them subject to petitions-to-deny but not competing applications.One year after the initial allotment plan has become final, any allotments that have not been final, any allotments that have not been authorized (or for which timely applications are not then pending) will be deleted from the Commission's data base and a second filing window will be opened, again for the filing of petitions by existing AM stations seeking to migrate. After completing this second filing window process, the FCC will determine whether additional stations can be added to the expanded band, taking care to maintain the high quality technical standards that will govern band expansion operation.

New Station Class Designation

In order to comply with international regulation, the FCC has reclassified AM stations.

Old Class	New Class
Class I	Class A
Class II	Class B
Class III	Class B
Class IV	Class C
	Class D
	Daytime-Only Stations
	Limited-Time Stations
	Stations with nighttime power less than 250 watts

While declining to impose new federal standards on the manufacture and sale of AM radio receivers, the Commission did underscore the fact that good receivers are critical to the success of a broadcast service. The FCC acknowledged the efforts of NAB and EIA in developing the AMAX receiver certification program and said that, in addition, the FCC would be publishing, "at appropriate intervals," lists of AM radio receivers that meet the NRSC standards. (The AMAX program radio receiver requirements include compliance with NRSC standards as well as with other receiver characteristics.) The FCC encourages manufacturers to include AM stereo reception capability in their products.

The Commission's action on the issue of Travelers Information Stations (TIS) was consistent with its overall approach to the use of the expanded AM band.

(Cont. to pg. 9)

World Radio History

Holiday Specials

FIDELIPAC TAPE CARTS	Model #300	Mastercart	Dynamax Cobalt
10 sec. - 100 sec.	$3.10	$3.85	$4.30
140 sec. - 4.5 min.	$3.45	$4.25	$4.80
5.0 min. - 10.5 min.	$3.98	$4.80	$5.45

SCOTCHCART TAPE CARTS

4.5 min.	$ 6.20
5.5 min.	$ 6.50
6.5 min.	$ 6.80

REEL-TO-REEL TAPE, CASSETTES, TAPE SUPPLIES & ACCESSORIES

Ampex 631 tape, 7" reels	$ 4.10
Scotch 806 tape, 10½" hub	$ 8.95
10 minute cassettes, bulk, (5 min. each side)	$ .60
90 minute cassettes, Ampex	$ .78
Empty 7" tape reels w/boxes, (minimum purchase, 10)	$ .69
Nakamichi DM-10 head demagnetizer	$ 24.95
Handi-Mag head demagnetizer	$ 26.50
Editall splicing blocks, S-1	$ 29.95
STL alignment/response test carts, 34-FI	$ 59.50
STL pink noise test cart, P-34-FI	$ 59.50
STL #22-4 R/R alignment tape, 1/4 track	$ 50.00
STL #2-2 R/R alignment tape, 1/2 track	$ 50.00

Also, various head alignment gauges. Call for prices.

MICROPHONES

Electro-Voice Pro-Line	
PL-6	$ 69.95
PL-10	$188.95
PL-77	$119.95
Electro-Voice Broadcast	
RE-85	$117.00
RE-20	$369.00
635A (less cable and clamp)	$ 82.50
Shure	
SM58-LC	$118.75
University Sound	
US658L	$ 59.95
Audio-Technica	
Pro 1A	$ 21.95
Pro 5	$ 99.95
Pro 7	$ 59.95
AT801	$ 76.95
AT835	$149.95
AT855	$124.95
AT857QM	$152.95
AT859	$121.95
Marantz (especially suited for PMD cassette recorders)	
EC3	$ 24.50
EC12B (telescoping)	$ 39.95

HEADPHONES

AKG45	$ 38.95
Stanton 35M/HB & 30/SR (especially suited for DJ'ing dances, etc.)	$ 24.95
Sennheiser HD 450	$ 79.95

World Radio History

(Cont'd from pg. 7)

In order to preserve new allotments for migrating AM stations, the Commission declined to set aside an expanded band frequency for exclusive or primary TIS operation.

The Commission has also reaffirmed that if an AM station goes dark and turns in its license, the allocation for that station will be deleted from the FCC database. At some later date, if someone desires to license a new station at this location, he would be required to comply with new interference rules so the new station would produce less interference on the AM band.

******

FCC PROPOSES ATV RULES

The FCC recently proposed rules which would affect broadcasters interested in ATV facilities.

Under the proposals, initiated Oct. 24, existing broadcasters would have the exclusive right to apply for ATV channels for three years after allotments are made before new applicants could seek frequencies. Broadcasters would then have just two years after channels are awarded to build new ATV facilities.

The rulemaking proposes that broadcasters must surrender their NTSC channels and broadcast only in ATV when "ATV becomes the prevalent medium." Three possible methods were suggested for conversion: 10 a specific number of years after nationwide penetration for ATV receivers is achieved; 2) when penetration rates reach a certain level on a market-by-market basis; or 3) on a specific date that would allow consumers enough time to purchase new receivers.

The FCC also is seeking comment on its proposal to treat at ATV channels as equivalent. Questions as to assigning channels include: * Whether it would be better to assign channels to existing licensees in a community randomly and simultaneously, or offer them on a first come, first served basis, with competing broadcasters "randomly ranked," during the filing window; * Whether broadcasters should be allowed to negotiate channel assignment changes after they are awarded; or * Whether it should impose a financial qualification requirement for assigning ATV channels.

While the FCC expects there will be sufficient spectrum for all ATV applicants, it proposed that, in the case of a shortfall, it would use "decisional criteria" or a lottery to determine which applicant would prevail.

The Commission also sought comment on whether requiring simulcasting would be an appropriate means of protecting consumer investment in television equipment.

******

MILITARY BROADCASTERS LOOKING FOR MEMORABILIA

Military broadcasters are looking for material to include in a book commemorating the 50th anniversary of the Armed Forces Radio & Television Service (AFRTS).

The Armed Forces Broadcasters Association (AFBA)—a non-profit organization—is asking for photographs, information and people on AFRTS stations to include in a golden yearbook.

AFRTS has provided U.S. military audiences around the world radio and TV news, entertainment and internal programming since 1942.

Publication is planned for April 1992, and submissions must be received by Jan. 15.

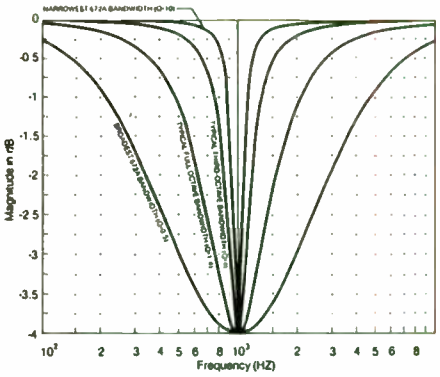
Submissions should include the sender's full name and address, and a description of the items provided. Photos should include location, date and names. The items will be returned as soon as possible. Mail submissions to the AFBA Alamo Chapter, P.O. Box 37381, San Antonio, TX 78237.

*****

The Orban 672A/674A Graphic Parametric Equalizers

The power of a parametric. The convenience of a graphic.

Use the 672A or 674A in the production studio to enhance the announce mic, sweeten music, and to create special production effects that make your station stand out amoung its competitors. Meanwhile, another 672A or 674A can be quietly and efficiently equalizing the program line for maximum punch and brightness on the air. The 672A and 674A can equalize phone or remote lines for flat response — they're much more versatile thatn the standard phone company equalizers. In the main studio, use them on the announce mic channel to equalize for maximum presence, and also to notch out mechanical hum from cart machine monitors, air conditioning, and similar noises. Whatever your application, the RF suppression and optional output transformer of the 672A and 674A ensure problem-free installation in high-RF environments.



Various Bandwidth Dipping Curves (4dB Dip) Model 672A

LIST PRICE $725.00

Call for E. I. Price

Out-of-State: 800-558-0222 or In-State: 800-445-0222

World Radio History

MEMO FROM METZ

BUILDING A LOW NOISE RECEIVING PRE-AM FOR UHF

This amplifier is very similar to the VHF unit described last month. Both use the rugged if somewhat old fashioned Motorola MRF-966 GASPET transistor. Both are modifications of well known published designs. The primary change I have made is to use a toroidal impedance matching transformer instead of the more common tuned circuit in the output.

Another worthwhile modification is to use a three terminal regulator to supply the five volts to operate the amplifier instead of a zener diode. Zener diodes make great R.F. noise generators, so no point placing one in a low noise amplifier circuit.

Like the previous VHF amplifier the toroid is the mystery part. The one I used is color coded "green/white." Outside diameter is 5/16", I.D. is 5/32" (8 mm X 4 mm). Turns were determined experimentally. Other windings may work better.

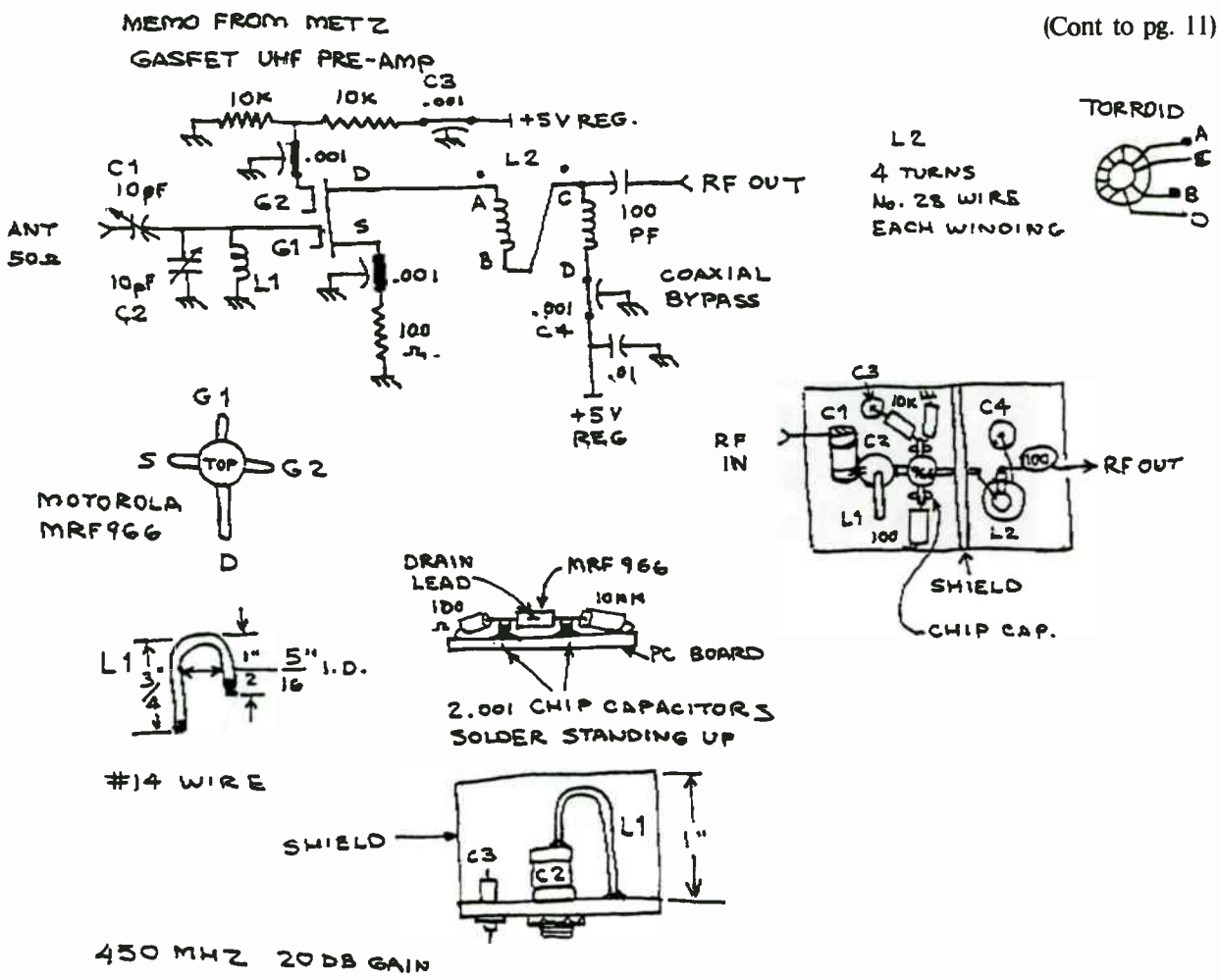
Pay close attention to the layout of the amplifier. At UHF, parts type and position is very critical. This amplifier uses one component you may not be familiar with, the piston trimmer. The one specifiied is a Johanson model .3-3. The value is .8 to 10 picofarad. These are a chassis mount device, gold plated with a ceramic body. Other similar piston trimmer capacitors may work if their body is short enough, that is .250" or less.

New, these trimmers are quite expensive. Fortunately they are a popular surplus item. You should be able to find them for $4.00 or less. I purchased mine (and many other hard to find microwave parts) from: Microwave Components of Michigan, P.O. Box 1697, Taylor, Michigan 48180. Phone is 313-753-4581, evenings only. This is a small one man company dedicated to helping microwave experimenters owned by Norm Alfred WA8EUU.

Remember, any loss in the feedline from the antenna to the preamp will be added to its noise figure! Thus, to use this amplifier to its best possible advantage, it has to be mounted at the antenna coax connector. Mounting R.F. devices outdoors is not as scary as it may seem. Most simple circuits tolerate the temperature differences quite well.

The pre-amp should be mounted in a die cast metal box. Connectors must be "N" series or better. They must be both constant impedance and weather proof! Don't even think of using UHF connectors here. When you mount the "N" connectors on the box, water proof seal the body of the connector to the box with a small amount of silicon RTV. Lay another thin bead of silicon around the inner lip of the boxes lid to act as a water proof gasket. Be sure to seal the lid's screw holes as well.

(Cont to pg. 11)



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(Cont'd from pg. 10)

Power could be supplied through the coax "phantom" style. I have never tried it, however I am told it works quite well. Instead I use a .001 mF ceramic coaxial bypass capacitor both as a feedthru through the box and to bypass local R.F. fields off the 13.8 DC power supply line. A short wire soldered to the capacitor with molex plug on the end allows quick disconnect of the amplifier.

Tune up of this amplifier is simple. C1 and C2 (our two piston trimmers) form and impedance matching circuit between the GASFET gate and the antenna (or 50 ohm feedline). You adjust for the lowest noise figure, that is the lowest amount of noise generted by the GASFET consistent with the most possible gain.

Note that the two points do not coincide! You will get the lowest possible noise somewhere other then maximum gain. Plus, the input impedance of the pre-amp will not be 50 ohms! GASFETS do not give their best noise figure when perfectly matched for lowest VSWR. Since the pre-amp is antenna mounted, VSWR losses are non-existent anyway.

Tuning can be done with the pre-amp connected to the noise generator published earlier. Connect the output of the pre-amp to an AM or CW receiver that can have its AGC shut off. Connect an AC voltmeter to the audio output of the receiver.

Log the audio voltage in dB's with the pre-amp on and the noise generator off. At this point you should be able to peak the pre-amp on just the Kelvin noise of the noise generator's 50 ohm pad! If you cannot, turn on the generator, increase the current to the noise head till you get a 10 dB increase.

Peak the input trimmers C1 & C2 for maximum output on the AC voltmeter. This will confirm that your pre-amp is working. You can also use a single generator at this point. Once you know the pre-amp is amplifying, sweep up and down the band on your receiver to make sure that it is not oscillating somewhere. If it is, you need more shielding or bypassing. Or your enclosure is by chance resonant.

The next part is somewhat tedious. You have to find the point of best amplification for the least noise. You do this by turning the noise generator on and off, comparing noise voltage with amplified signal, making slight adjustments each time to find the best setting.

A hint: C1 controls coupling between the antenna and pre-amp. C2 resonates the input tank circuit. Together they act as an impedance transformation circuit. As you decrease the capacitance of C1 (screwing it outward) you will increase the gain of the pre-amp as the coupling is reduced. Lower coupling makes C2 L1 tune sharper. It also decreases the stability of the amplifier in some cases. Start with C1 set half way in and then reduce the coupling 1/8 turn at a time to see the affect on peaking C2 and the gain/noise figure ratio.

There you have it. If you have any questions or more interest in these type of project, please contact me or Gordy.

*****

SUPERCONDUCTING DEVICE SHOW PROMISE FOR MEDICAL APPLICATIONS

The first high-temperature superconducting magnetic gradiometer to be operated at liquid-nitrogen temperature has been reported by researchers at the IBM T.J. Watson Center.

A gradiometer used the most magnetically sensitive detector known, a Superconducting Quantum Interference Device, or SQUID, to measure extremely weak magnetic fields.

Unlike related device, like magnetometers, a gradiometer doesn't need to be shielded from external fields like those from the earth and from nearby electrical equipment and electronic instrumentation. Without such shielding, which van be cumbersome,

(Cont to pg. 12)

The Orban 424A Gated Compressor/Limiter/De-Esser

The Studio Optimod

The Orban 429-A: It Had To Be Better, Or We Wouldn't Have Bothered

The 424A "Studio Optimod" is the answer to many engineer's dreams. It combines a compressor, limiter, and de-esser in a most versatie way. Because its controls interact in a carefully human-engineered manner, it is easy and graceful to operate. Yet full flexibility is there to get the sound just right.

The professional audio and broadcast world has lived happily with "old favorite" limiter/compressors for a long time. If you examine the features, sound, performance, and price of our new "Studio Optimod" Model 422A/424A, we think you will agree that it is the new standard in dynamic range control. But we don't expect you to take our word for it. The proof is in the listening. We feel confident that once you A/B our unit against any of your current favorites, you will find a place for it in your rack.

It's that good. A truly superior device, at the right price, at the right time. Rest assured that with your new 422A/424A, you will continue to receive all the other things that you've come to expect from Orban products over the years — quality construction, comprehensive operating and service manuals, and unequalied customer service.

List Price $1150.00

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or

In-State: 800-445-0222

World Radio History

(Cont'd from pg. 11)

magnetometer measurements would be subject to interference. Gradiometers are consequently more suited, for example, to real clinical medicine environments in which the magnetic fields emanating from the heart and brain need to be measured in producing magnetocardiograms and magnetoencephalograms. And because these devices need less thermal insulation they can be placed much closer to the patient, thereby providing increased accuracy.

Fabrication of gradiometers relies on a "wet-etching" process that inscribes patterns in the thin films of material used to insulate layers of superconductor and stops when the superconductor is reached. With this process, IBM researchers were able to achieve pattern line widths as small as five microns (five millionths of a meter) in multi-layer spiral coils with as many as 200 turns.

******

NAMES, NUMBERS OF MANUFACTURERS ON NAB'S AMAX LIST

Stations taking part in the AMAX campaign have asked NAB how to contract receiver manufacturers to ask when they will be producing AMAX-certified radios.

Delco already has five AMAX-certified models available on 1992 GM cars and Denon will introduce its AMAX-certified radios at NAB '92 next April. Denon says the radios will be available for purchase at the NAB Store and will be at retailers nationwide just after NAB '92.

Other receiver manufacturers who have been visited or contacted by NAB and Ted Snider, chairman of the AM Receiver Manufacturer Liaison Task Force include:

Acustar—R.J. (Jack) Ellis, supervisor, radio development, Philips and Acustar Autoelectronics. 100 Electronics Blvd., P.O. Box 240001, Huntsville, AL 35824-6401. Phone (205) 464-2172, Fax (205) 464-2786.

AIWA America—Rusty Bennett, VP/sales, 35 Oxford Dr., Moonachie, NJ 07074. Phone (201) 440-5220;

Bang & Olufsen—Kristrian Gadgaard (in Denmark). Phone (459) 785-1122, Fax (459) 785-5942;

Carver—Vic Richardson, Carver Corp. P.O. Box 1237, Lynnwood, WA 98046. Phone (206) 775-1202;

Chrysler—Jim Muccioli supervisor, audio products, Engineering Office,Chrysler Corp., 12000 Chrysler Drive, CIMS41723-16, Highland Park, MI 48228-1118. Phone (313) 956-0103, Fax (313) 252-6819;

Dynascan Corp.—Jerry Kalov, president, 6460 West Cortland St., Chicago, IL 60635. Phone (312) 889-8870, Fax (312) 889-1678;

Ford—Don McIsaacs, audio business planner, audio systems, electronics Division, Ford Motor Co., Regent Court Bldg., 16800 Executive Plaza Drive, P.O. Box 6200, Suite 310 Dearborn, MI 481266200. Phone (313) 845-1580, Fax (313) 845-4267;

Jensen—Pat Murphy, International Jensen Inc., 855 Caton Road, Lumberton, NC 28358. Phone (919) 739-6121;

Mitsubishi—Rick Moore, Mitsubishi Electronics, 46501 Commerce Center Drive, Plymouth, MI 48170. Phone (313) 455-3844;

Panasonic—Robert Finger, assistant director, audio/video and Information Systems Division, One Panasonic Way, Panazip 1E-6, Secaucus, NJ 07094. Phone (201) 348-7768. Also, andrew Nelkin, assistant general manager, Home Audio Division. Phone (201) 348-7695, Fax (201) 348-7954;

Philips Consumer Electronics (Philips, Magnavox, Marantz Mike Piehl, marketing manager, Philips Consumer Electronics, One Philips Drive, P.O. Box 14810, Knoxville, TN 37914-1810. Phone (615) 521-4390, Fax (615) 521-4406;

Sony Corp. of America—R.E. Dillon, executive VP, Sony Drive, Park Ridge, NJ 07656-8032. Phone (201) 930-6050, Fax (201) 9300893. Also, Michael Vitelli, president, Personal Audio Products Co. Phone (201) 930-7645;

Thomson Consumer Electronics (RCA, GE)—Monroe Gordon, manager, marketing support, 6225 Run-

(Cont. to pg. 14)

NEW FROM ATI!

HD1000 STEREO HEADPHONE AMPLIFIER

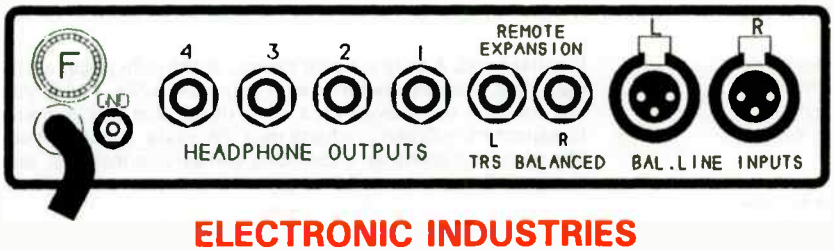
Drive directly four stereo headphone outputs with a mix of a stereo line level input plus a panned front panel microphone input for adding paging, annotation or instructor comments.

Drive all types of headphones with efficient, quiet, high compliance, low distortion drive circuitry. Balanced, instrumentation amplifier line and microphone inputs provide low noise and excellent common mode hum rejection.

Loop the HD1000 balanced stereo remote expansion outputs into additional HD1000s for more groups of four outputs each. Daisy chain any number of small HD1000 single stereo headphone amplifier modules distributed amount various locations for classrooms, study carrells and offices.

The HD1000 is designed for attractive desk or EIA rack mounting singly or two side-by-side. The HD100 moduale is small enough to hang under a desk or mount behind a panel and attractive and rugged enough to place on top.

HD1000	Four Output Headphone Amplifier	$395.00	B
HD100	Single Output Headphone Amplifer	$150.00	B



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NOW THERE ARE TWO MODELS OF COMPUTEMPS TO CHOOSE FROM

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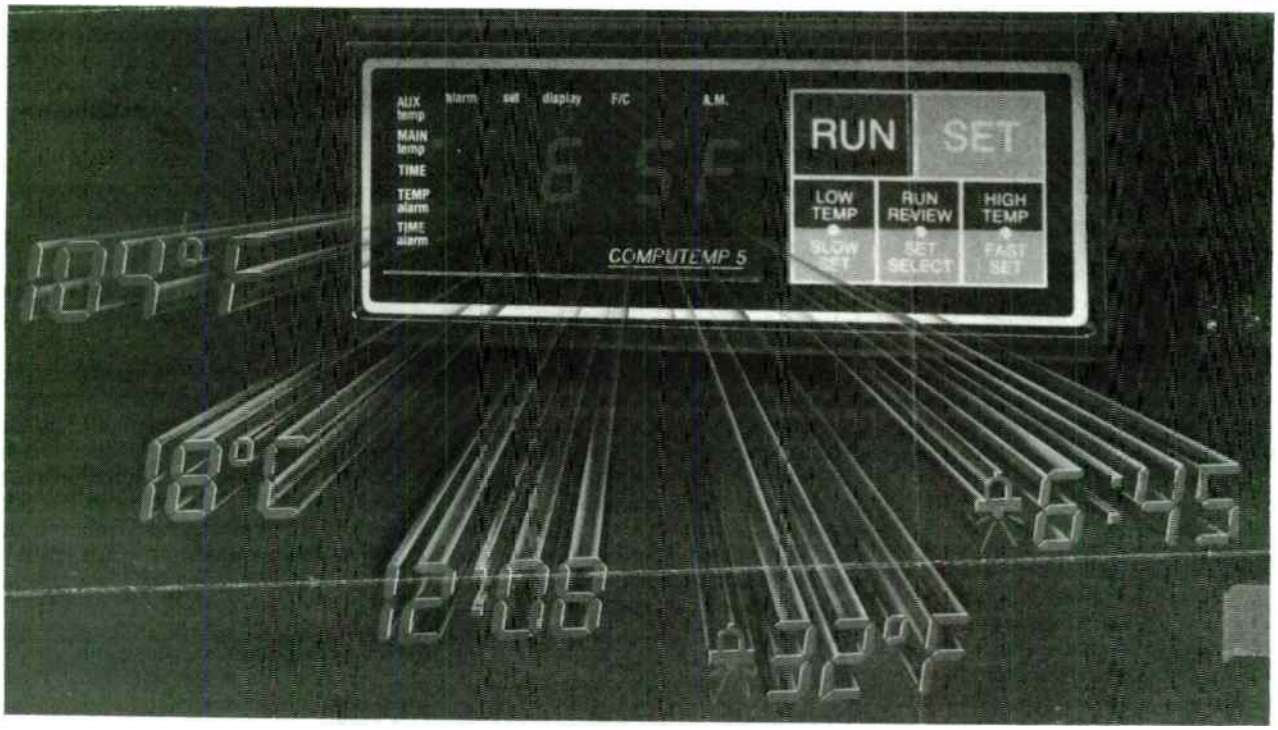
5 in 1

DUAL TEMPERATURES
TEMPERATURE ALARM • MEMORY
CLOCK • TIME ALARM



CompuTEMP 5

SPECIAL HOLIDAY SEASON PRICE FROM ELECTRONIC INDUSTRIES

Computemp 5 just $56.95
Computemp Plus just $47.95

Above prices do not include shipping & handling

CompuTEMP Plus gives you a VISUAL DISPLAY of the current temperature at two locations (±1°) in C or F; and you can be warned by an AUDIBLE ALARM when a too high or too low temperature is reached at either remote location.

No glasses needed to read the large .6" primary display. **CompuTEMP Plus** also displays TIME and DATE. It can be set to wake you with an AUDIBLE ALARM at the time you set. Time is either 12 or 24 hour format.

CompuTEMP Plus runs more than one year on a 9V battery. With standard cord, the main sensor may be placed 15' away from the console.* That could be outside or inside or both in different rooms.

The most popular feature of **CompuTEMP Plus** is the memory. Recall the low or high temperature of the day by pressing one button. Temperature and the time it occurred will be displayed.

Only 6.5 "W x 2.6"H x 1.4"D, the instrument can be used on a counter, desk, or table, or wall mounted. In the home, popular console locations are in the kitchen, on a night stand, near a window for easy sensor cord route to the outside, or near the home thermostat.

* Accessories can be added to extend either sensor to any location (up to 1000').

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(Cont'd from pg. 12)

ning Ridge Road, Syracuse, NY 13212-2510. Phone (315) 452-4151. Also, Marc Navarre, product manager, Hi-Fi. Phone (315) 452-4224, Fax (315) 4524294;

Yamaha Electronics Corp, USA—Don Palmquist, resident, 6722 Orangethorpe Ave., Buena Park, CA 90620. Phone (714) 522-9105; Stations also have asked who to contact at retail chains concerning their placing orders with manufacturers for AMAX-certified receivers. NAB has contacted:

K-Mart—T.J. Hooks, lead buyer, major appliances, 3100 W. Big Beaver Road, Troy, MI 48084-3163. Phone (313) 643-1587. Fax (313) 643-3241;

Sears—Attilio Cosgrove, buyer, personal portable audio. Home Office, Sears Tower D/657 BSC 25-16, Chicago, IL 60684. Phone (312) 875-2018, Fax (312) 875-4994. Also: Harry Ruther, P.E., senior product engineer, Sears Laboratories, Sears Tower D/817 BSC 23-26 etc. Phone (312) 875-7620;

Wal-Mart—Mike Antonetti, radio receiver buyer, 702 Southwest 8th St., Bentonville, AR 72716. Phone (501) 273-4412.

******

VCR-QUALITY TV OVER PHONE LINES

Using a new, experimental Bellcore (Livingston, NJ) technology, VCR-quality television, voice, and data can be sent simultaneously over a single copper telephone line. Asymmetrical digital subscriber line (ADSL) technology, using digital signal processing (DSP) techniques and experimental very-large-scale integrated (VSLI) circuitry, can expand the transmission capacity of today's copper-based telephone network. DSP raises weak transmissions to acceptable levels and VLSI circuitry allows that processing to be done using a few specialized high-speed microchips instead of requiring large, expensive computers.

ADSL technology is proposed primarily for the "customer loop" that links residences and businesses to the central switching office. Even though future telecommunications systems are generally expected to be based upon fiver-optics technology, a large percentage of the customer loops are still copper-based. According to Bellcore, ADSL can serve as "an interim technology that can link fiber and copper telecommunications facilities" and provide customers with a sneak preview of "information age" services— including access to library data bases, shop-at-home services, and long-distance "video learning." While ADSL in not intended to take the place of future fiber-optic networks, on the short term it can provide enough capacity for customers to be able to receive VCR-quality video along with a regular phone call. Bellcore has already developed an algorithm for the real-time compression of video signals within the capacity of an ADSL line. Customers could also use ADSL to transmit low-speed data from their PC's and fax machines or to access data banks. Those services could be provided without the expensive conditioning of lines or installation of circuit repeaters now needed to get similar services over the already-existing copper lines.

******

GENTNER CHANGES NAME TO REFLECT CORPORATE MISSION

Gentner Communications corporation (NASDAQ:GTNR) a provider of radio broadcast and audio teleconferencing equipment, today announced the official change in the Company's name to Gentner Communications Corporation. Prior to the change, the Company was named Gentner Electronics Corporation.

(Cont. to pg. 15)

E.I. CARTRIDGE REBUILDING SERVICE

- *COMPLETELY CLEANED*
- *ONLY APPROVED TAPE*
- *72-HOUR TURN-AROUND SERVICE IF REQUIRED*
- *ALL CARDS 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.
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World Radio History

COMMON POINT CLASSIFIEDS

EI Classifieds

EI Classifieds are free to the readers of Common Point magazine. To place an ad type it on the acknowledgement card that comes with each issue and mail to us. We assume no responsibility for the condition of any of the equipment or services in these ads.

FOR SALE 1—Gentner SPH-4 Telephone Hybrid. Excellent $500.00, 1—CRL IPP100 Mic Processor. Excellent $1,300.00, 1—CRL PMC-300A with SPF300 NRSC Adapter. Excellent $1,000.00, 1—QEI 7775 Composite FM ATS System. Good Condition $500.00, 1—Collins 310Z2 20 Watt FM Exciter. Excellent $2,000.00, 1—CCA FM40E 40 Watt Frequency Agile Exciter. Very Good $2.000.00, 1—CRL SEP400A Mono 4 Band Compressor. Almost New $1,000.00, 1 CRL SEC400 Mono 4 Band Compressor. Almost New $1,300.00, 2—Moseley MRC-1600 Remote Control for Wire Line $1,800.00, 1—Marti RPT-1 RPU Transmitter. 455.087 ' 455.187MHz good condition with rechargeable battery $350.00, 1—Sparta/Cetec 3410 10 channel stereo console. Very Good Condition $1250.00. Contact: Mark Persons 218-829-1326 phone 218-829-2026 fax.

FOR SALE 1987 Advanced Micro-Dynamics TC-8 Remote Control system, $1,500.00. 150 ft. AM tower, still standing. Harris solid state 1000 watt AM transmitter, bought new in 1986 and used four years, Gentner Audio Processer. These items need to be sold immediately! Contact: Wanda Smith (901) 989-5981.

HELP WANTED: I am seeking a position in radio or TV - I have some basic engineering experience and also DJ & production. Please call me evenings at (717) 636-1355 if you have any leads for me. Bldg. 12 Apt. 5 Freeland Village, Freeland, PA 18224. John Askey.

TALKBACK

WICHITA, KS—Great information keeping informed on FCC activity.

LEXINGTON, NE—Super info! Hats off to Metz—excellent technical tips.

SIOUX CITY, IA—Enjoy informative articles, Thanks.

ROSWELL, NM—Great reading! Information we can really use.

WARRENSBURG, MO—Common Point is a must read for me each month. I keep them on file for future reference.

******

(Cont'd from pg. 14)

Mr. Russell D. Gentner, Chief Executive Officer, stated, "The primary purpose for the name change is to better reflect the Company's mission to help people 'Improve Communication Through Innovation.' Our goal is to help people communicate by providing them with useful, innovative products they can use as communication tools. With our recent efforts in the Audio Teleconferencing market and our continued development of communication equipment for radio broadcasters, Gentner has truly become a diversified communication company."

Mr. Gentner also noted that on September 30, 1991, the Company successfully completed a secondary public offering of 1.25 million Units, resulting in a net capital increase of over $3.2 million. He said that the additional capital raised through the secondary offering provides the Company with the funding it needs for future growth and the fulfillment of its mission.

*****

FORMER PRESIDENT CARTER ENDORSES SISTER STATION AGREEMENT BETWEEN U.S. AND SOVIET BROADCASTERS

Former President Jimmy Carter has joined the National Association of Broadcasters in support of a major effort to establish sister station agreements between broadcast stations in the U.S. and the Soviet Union.

The agreement was announced by Carter and broadcast leaders at a U.S.—U.S.S.R. broadcasting conference at the Carter Center at Emory University in Atlanta. The initiative also will involve the support of the U.S. Information Agency (USIA), which is responsible for Voice of America, and the International Association of Sister Cities.

NAB President & CEO Edward O. Fritts said a U.S.—U.S.S.R. commission organized by the Carter Center and the USIA will identify and recruit the appropriate local broadcast stations in the Soviet Union to participate. Fritts also said the program's objective will be to strengthen the cultural, educational, economic, and professional ties between participating U.S. and Soviet stations.

Among the program benefits will be exchanges involving broadcast trainees and visits by American broadcasters offering guidance on broadcast technology, programming and management, Fritts said.

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U.S. HAS DAB STRATEGY FOR WARC

The FCC and the White House have decided to seek an S band allocation for satellite and complementary terrestrial DAB at 2.3 Ghz. That recommendation will form the basis for DAB proposals and negotiating positions of the U.S. delegation to the World Administrative Radio Conference (WARC) next year.

The specific band to be considered is 2310-2360 MHz

FCC Chairman Al Sikes indicated that the FCC is examining carefully the development of solutions for achieving terrestrial DAB within spectrum currently allocated to broadcasting.

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The FAA has recently reported that new AM and cellular applications will be studied only for obstruction hazard considerations and will no longer be subject to EMI studies to determine possible hazard to aircraft communications. This is the first signal that the FAA may be softening its position with respect to broadcast interference to aviation radios. Meanwhile, the FCC has relaxed restrictions on the issuance of CPs for FM facilities which received an FAA objection due to EMI considerations. In cases where the FAA had been given the opportunity to renew their objection to the FM proposal, but did not take advantage of that opportunity, the FCC will issue a CP conditioned upon one year of operation without interference to avionic receivers . . .

—from Evans Associates Broadcaster's Report

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- Measures performance characteristics of RF cables, connectors and amplifiers (when used with an RF sweep source)
- Education

SPECIFICATIONS

FREQUENCY CHARACTERISTICS

Measuring Frequency Range: 1 to 1000 MHz
Center Frequency Resolution: 1 MHz
Center Frequency Accuracy: ±3 MHz after calibration
Frequency Span and Resolution Bandwidths:

Frequency Span, MHz/DIV	-3 dB Bandwidth, kHz	
	NORM	FIXED
100	1000	1000
50		
20	300	
10		
5	100	
2		
1	30	
0.5		
0.2	10	
0.1		

Frequency Span Accuracy: ±6% at Center Frequency above 100 MHz, ±10% at Center Frequency below 100 MHz
Sweep Width: Approx. 3 ms/DIV; adjustable approx. 5%.

AMPLITUDE CHARACTERISTICS

Measurement Range: 15 to 123 dBµV (80 to 123 dBµV on panel and 15 to 80 dBµV on screen)
Maximum Input Levels: 123 dBµV at Reference Level setting above 100 dBµV, 103 dBµV at Reference Level setting below 100 dBµV, DC: ±50 V
Dynamic Range: 70 dB at frequencies above 10 MHz, 60 dB at frequencies below 10 MHz
Frequency Response: Flat within ±2 dB
Display Scale: 10 dB/DIV fixed, 8 divisions
Display Accuracy: ±2 dB
Input Impedance: 50Ω/75Ω, switch selectable

CALIBRATION OUTPUT SIGNAL

Frequency: 100 MHz ±10 kHz (plus harmonics)
Amplitude: 80 dBµV ±0.5 dB (terminated into 75 Ω)
Output Impedance: 75 Ω

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CRT Type: 3.5 inch rectangular with internal graticule
Display Area: 8 x 10 divisions (0.25"/DIV)
Center Frequency Indication: 3-1/2 digit LCD display
Operating Temperature Range: 0 to 40°C
Power Requirements: AC: 100/115/215/230 V ±10%, 50/60 Hz; DC: 12 to 15 V, less than 1.2 A; Battery: 12 V, 1.8 Ah internal rechargeable nickel-cadmium (1 hour or more continuous operation following 2 hour recharge cycle)
Dimensions (H x W x D): Approx. 11.5 x 30 x 34 cm (4.5 x 11.8 x 13.4")
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