

AM Stereo Decision for Magnavox

Washington, DC ... After hearing conflicting testimony from its various staffs, the FCC at its 8 April meeting, on a 4-2 vote, directed the Broadcast Bureau to resubmit a final recommendation to approve the Magnavox AM stereo system. Commissioners Jones and Brown dissented, and Commissioner Lee was not present (though Chairman Ferris stated afterwards that Lee would have gone along with the majority).

Broadcast Bureau Position

Discussion began with the Broadcast Bureau's Jim Green presenting the staff's recommendation that all five systems under consideration (Kahn, Harris, Motorola, Belar and Magnavox) be, in essence, approved via the mechanism of setting minimum standards that all five systems currently meet. The justification for taking this position was that the

Broadcast Bureau & Office of Science & Technology at Odds

Commission would be better off setting standards and then letting the marketplace decide which system was best. It was not made clear whether the marketplace being referred to was the consumer marketplace or the broadcaster's marketplace, but in any case, it was admitted that over some undefined period of time, one, or at most two, systems would predominate.

This admission led Chairman Ferris to question the validity of letting the marketplace decide versus making some sort of technical determination as to which system was best, and then approving it on its merits. Also, the question of consumers requiring multiple receivers, or a "universal" receiver was broached with

conflicting testimony as to the costs of a "universal" receiver to the public. Commissioner Washburn seemed especially concerned by this, particularly in the instance of car radios. His point was that a car radio, by travelling from one market area to another might be incapable of AM stereo reception because of stations using different stereo systems. Unfortunately, no one seemed to have solid information as to the costs of a receiver capable of receiving all five systems, as opposed to receiving only one system.

Chairman Ferris also brought up the question of decision by lottery. If, in fact, all the proposed systems were technically equivalent, then why not decide by random selection? On this, the Broad-

cast Bureau did admit that there were technical differences, but deferred to representatives of the Office of Science and Technology as to the relative technical merits of each system.

The S&T Matrix

A number of personnel representing the Office of Science and Technology made plain their technical viewpoint that the Magnavox system was best. Dr. Powers pointed out that the consumers cannot rationally decide on a technical matter such as this, and that they probably couldn't even detect the differences between systems in any case. He also noted that making the consumer pay for a "universal" receiver was an unfair burden, when he felt that one system was better.

Larry Middlecamp, who chaired a joint committee representing the Broadcast Bureau and the Office of Science and Technology on this matter, then proceeded to describe how their Office came up with the Magnavox recommendation. A matrix of eleven performance factors (such as signal quality, degradation of monaural performance, etc.) was generated, and each of the five proposed systems were scored across the matrix. Weights were then attached to the various performance factors, and an overall score was then derived. Market research professionals would call this a rank order, unidimensional scaling technique which reduces a great deal of complex information to a rather simplistic score. As was pointed out in discussion of this methodology, if the weightings on the various performance factors

(continued on page 23)

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INSIDE BEE

- WKDC Tests **2**
- Production Tech **3**
- Reader's Forum **4**
- March FCC **5**
- The Audio Process **8**
- Texwipe Kit **9**
- Radio Ads **10**
- Free on VTR's **11**
- QSC Patents **12**
- Mexico Rep **13**
- Action-gram **15**
- "The Exchange" **14, 16-22**

WKDC Tests Motorola Stereo System

by Kathleen Imbema

Elmhurst, IL ... Even as the FCC indulges in a final round of debate concerning the feasibility of AM Stereo, individual stations across the country stand staunch in their defense of one particular AM Stereo system against the claims of its four competitors. Although the industry is unanimous in its approval and support of AM Stereo, opinions as to the superiority of one system as opposed to another flourish and usually clash.

Station WKDC of Elmhurst, Illinois, has been involved in AM Stereo testing for more than three years. Frank Blotter, President of WKDC, has not only tested various systems at his own station, but has also been present at different stations when other AM Stereo systems were tested. The insights that Blotter

brings to the AM Stereo discussion constitute a refreshing re-evaluation of the AM Stereo situation, its problems and priorities.

WKDC concluded its first testing of AM Stereo in December, 1976. Blotter reports, "As a result of our 1976 testing, we recorded "off the air" AM Stereo as transmitted during the day and night with specially built AM Stereo receivers. During daytime experimentation, WKDC told the listeners what was going on, and the telephone response flooded the station. First we fed both channels; then we mentioned that we would remove one channel, giving a one channel feed. We would then restore that channel and remove the other. Using today's standard receivers, those found in the home, listeners told us that they could easily tell the difference, based on the sound, and were able to follow what we had been doing."

Blotter adds that his station demonstrated both day and night mode AM Stereo transmission on standard broadcast equipment at the 1977 NAB Convention. Since that demonstration, WKDC has received both a number of inquiries about AM Stereo as well as visitors who want to know more; the Secretary General of the National Association of Commercial Broadcasters in Japan wrote to WKDC, asking if the station would permit two of their engineers to visit and examine their AM Stereo set-up. Of course, his request was approved, and later, engineers from all over the world—Sweden, Australia, England, South America and the United States—visited the station.

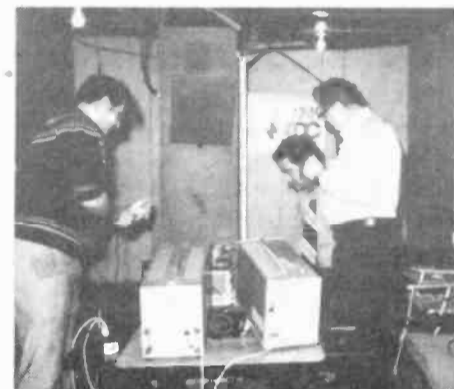
FCC Cooperation

Blotter points out that the FCC has received an incredible amount of data, petitions and reports, from manufacturers, engineers and others who have some interest in the AM Stereo decision. WKDC's President feels that the Commission has been "kind and considerate" to all of these petitioners, and was especially gracious in expediting WKDC's request for on-air testing in the fall of 1976. Blotter contends that the FCC's extensive testing procedures were necessitated by the number of systems now being considered for AM Stereo transmission. WKDC's contribution to the testing effort was important because of the station's Chicago location and the inherent difficulties of producing decent AM Stereo transmission in an area "...whose sky and air is saturated with signals from all frequencies and a multitude of electronic gadgetry."

WKDC and Motorola

Blotter points out that when he and Mr. Glenn Webster first built WKDC in 1974, the station was all stereo equipped, with the exception of final audio stages and transmitter, as required by FCC regulations. "Our transmitter is a Sparta (Cetec) 701B, and the frequency response was excellent for AM Stereo. There are

5 entrances in this transmitter through which the Motorola stereo exciter may be injected. After testing various inputs, the simple insertion proved best. Two easy solder points were needed; anyone could do this in 20 seconds. However, one must remember that all other components have to be right." Apparently, WKDC found Motorola's system more than adequate. Blotter is unconditional in his support: "If Motorola AM Stereo can work well under the existing conditions in the WKDC area, with our low powered 2 tower directional, it will work anywhere."



John O'Brien, Frank Hilbert and Charles Marick at the WKDC transmitter watching response curves during pre-testing.

More on Testing

WKDC did not stop with that testing; during the past year Blotter, Frank Hilbert, John O'Brien and Charles Marick of Motorola concluded supplementary tests for the FCC reports. Their purpose was to demonstrate the lack of interference problems or loss of signal propagation in transmission of AM Stereo.

"Our testing ranged from various signal types up to 100% modulation. Specific program material was tested at frequencies of 4500, 7500, 10,000 and 20,000 Hertz. All signal responses were photographed with a Polaroid-coupled camera to a 5441 Tektronix scope and a 7L5 spectrum analyzer. The photographs established that there are no interference problems of AM Stereo transmission."

(continued on page 9)


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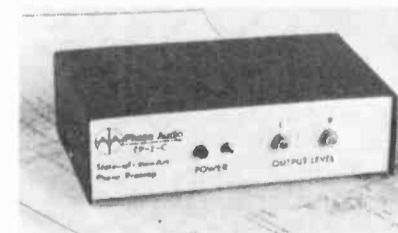
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Winn Schwartau on Recording:

Production Recording Techniques

Ossining N.Y. . . . Although the majority of production facilities today are built around the several mono and stereo machine formats we outlined in the last issue, not everyone can dedicate all the equipment or space to such a control room. This is especially true for the small 8 track or occasional 16 track studios whose primary business is their local music trade. To rededicate a sum of money for a new venture may not yet be feasible for these studios, although clearly, expanding into the production areas is desirable for them at some point. What can the small multitrack studio owner do to overcome these problems, and yet still offer his clients the freedom of using his room for their post-production?

As we mentioned last month, the conventional multitrack recording techniques, and certain production techniques are becoming increasingly similar, and it follows that a similar facility can be used to achieve both products ends. In the typical multitrack recording session, often the rhythm tracks will be laid down, then a few single instrument overdubs, then the voices, etc. until the entire musical picture is painted on a piece of tape either 1 or 2 inches wide. Production work follows the same pattern, painting the final composition by adding one element at a time. In this case though, we paint the production picture by adding a sound effect here, an announcer there, a few seconds of music perhaps a cross-fade until the entire

scenario is finished to the producer's satisfaction.

Production Procedure

In the mono-stereo machine format, when one performs the production task, we will see the various elements of the final product layed up on each individual machine waiting to be cued into the mix

at the appropriate time manually by pressing the PLAY button on the machine with the element required. This is done as often as necessary until the timing of the element's insertion is accurate enough to either match a picture, or fit into the required 28:sec or 58:sec allotted time slot. The advantages in this method of production work are pro-

found, yet this procedure is open to disagreement:

1. Each element is totally separate, on individual reels of tape.
2. Each element may be "shifted in time" with respect to the rest of the mix by playing the machine with that element at the proper time.

(continued on page 6)

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Broadcast Equipment **Exchange**

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The Audio Process, V.U.

Dear BEE:

Read with interest your article on the V.U. I am interested in your offer of providing a V.U. mount circuit board. Please advise when these will be available.

Henry G. Niederkofler
WCUE
Akron, OH 44313

BEE Replies:

Thanks for your interest, Henry, we have heard the same from a few other readers. In fact, one reader, Kenneth Rockwell in Old Bethpage, NY, has already built a circuit like the one shown in the article, and has promised to report on its operation. We will let you know if the board becomes available.

Dear BEE:

I enjoyed Bill Sacks' article on the VU meter very much. However, in the isolation circuit for the meter, he neglected to tell what IC he was using. Please let me know.

Hugh M. McBeath
KJBC
Midland, TX 79701

BEE Replies:

As shown at the very top, center of the figure, you can use a TLO-72 or the MC-1458 or 4558 IC in this circuit.

FCC Report

Dear BEE:

On page 5 of the March, 1980, BEE there was mention of two FCC reports on UHF reception, and a new technique called "multi-element depressed collec-

tor." I would very much like to receive copies of these reports, if possible.

James A. Allyn
KWWW
Wenatchee, WA 98801

BEE Replies:

We will see if we can get them for you, Jim, but give us some time as we're not sure they are still available at the FCC.

More on BEE

Dear BEE:

Please delete the following listing from BEE. We have listed _____ for several years with others but have never had any calls. Sold them on the first call and had six other calls. Great!

Jack Vobble
WLEW
Bad Axe, MI 48413

Dear BEE:

Enclosed is my listing for some equipment that I have available for sale. Please run the ads in the next issue of BEE.

For what it's worth, here are my thoughts regarding the "no prices published" policy....

I would much rather see all prices published in the newspaper itself, and NOT in the key-code! It is a hassle to look up prices in the key code, and it's impossible to get a feel for the value of piece of equipment if one has to go through several months of key codes just to get price information.

I also want all BEE readers to see my prices, not just those who get the key code with their issue. Very few readers will respond to an ad if they have no idea

(continued on page 11)

Announcing ... New From Kahn

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Circle 106 on Action-gram.

March FCC Developments

by B. Jay Baraff

Baraff, Koerner & Olender, P.C.

Washington, DC ... Once again, the past month has been a busy one for the Commission and the following are some of the highlights.

We would like to again remind you that for those of you attending this year's NAB Convention, we'll be staying at the Las Vegas Hilton. Please make a special point to drop by our suite.

IMPORTANT REMINDER: The annual financial Report (FCC Form 324) was to be filed with the FCC by April 1, 1980. If you have not done so, please contact us *immediately*.

Public Inspection File

Every broadcast licensee and applicant should be aware that Commission Rule 73.3526 (formerly Rule 1.526) requires that a public inspection file be maintained in the city of license or application. The file must be available for public inspection during normal business hours. For applicants, the file must contain a copy of the application and all documents related thereto, including amendments, correspondence with FCC, supplements, etc. The requirements for licensees are far more comprehensive and include, among other matters, ownership reports, employment reports, renewal applications and program-issue lists. Annual financial reports need not and *SHOULD NOT* be kept in that file. You can't request identification from anyone seeking to see the file. If you have any questions as to what should be in your file, please contact us immediately. For applicants, failure to maintain the file can mean a serious issue in a hearing. For licensees, it can mean a substantial monetary fine if not worse.

Distress Sale Assignment

A. The FCC has denied permission for Grayson Enterprises, licensee of Station KLBK AM/FM, Lubbock, TX, to voluntarily sell those stations as a result of hearing issues designated against the licensee for four other stations on lack of candor, misrepresentation, unauthorized change in studio location, fraudulent billing and program log falsification. Those stations are being sold by distress sale. Thus, until the distress sale applications are approved, or the character issues are favorably resolved, the FCC will not permit voluntary sale of these stations which would generate substantial and unwarranted benefits to the principals.

B. In a similar case, the FCC permitted the assignment of license of WMIL-FM, Aukesh, WI, licensed to Stebbins Communications, Inc., which is also the licensee of Station WMJX(FM) in Miami, which was designated for hearing and subsequently denied renewal for broad-

casting false, misleading and deceptive matters with respect to contests. However, the Commission indicated that, in this case, the principals were not involved in the wrong-doings but only exercised a lack of control.

C. The FCC has now established new procedures to be followed in future distress sale proceedings. The buyer and seller will each submit an appraisal of the

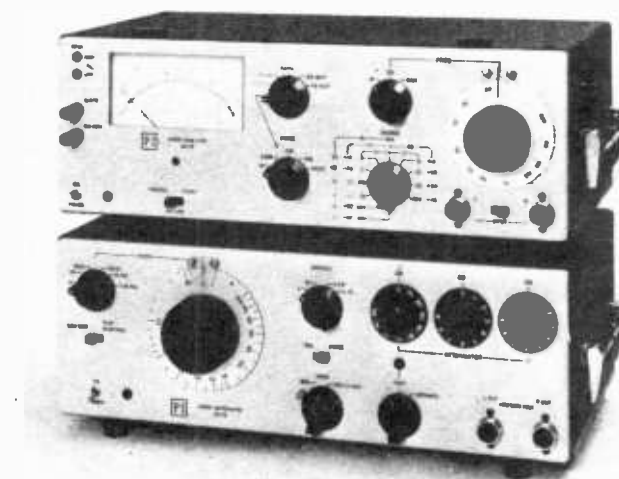
station's fair market value and the average of these appraisals will be used to determine the ratio of the purchase price of the fair market value. If the difference between the appraisals exceeds 5% of the average of the appraisals, the parties will jointly retain a third appraiser and the average of those appraisals will be used to calculate the ratio. No distress sale will be approved in which the ratio

between the purchase price and the fair market value exceeds 75%.

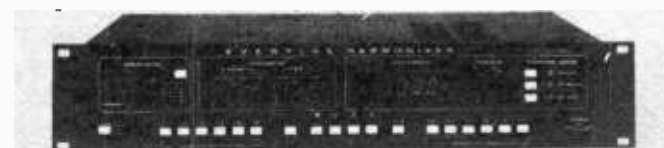
Increase in Assignments

In a major proposal, the FCC has requested comments changing the availability of commercial FM broadcast assignments to allow stations with Class A facilities to operate on Class B-C
(continued on page 12)

SPECIALS



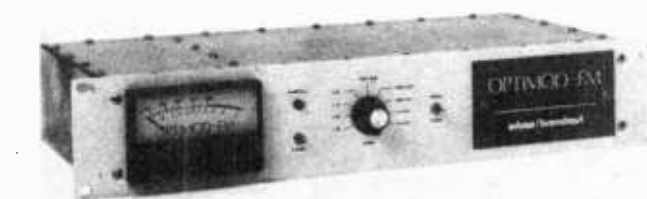
AT-51 Potomac Test Set—IN STOCK



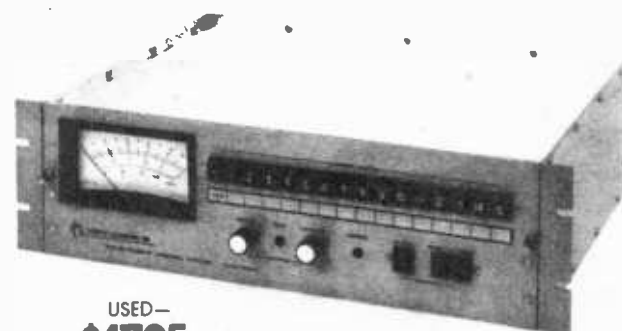
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Elements of Production Recording

(Continued from page 3)

3. Once the mix is done, it's done. One is mixing straight to mono (stereo), and each attempted pass with all the elements is a mix.

These advantages have let the production studios for many years feel they had all that was necessary to turn out their products. But, in certain cases, specifically those production efforts which involved some lock-up or sync with film or video tape, other techniques evolved which have seen growing acceptance into the "audio only" production rooms. The actual use of the multitrack storage medium as the single production tool, permitted many additional advantages, and often time savings over the older traditional methods. For example: we are doing the sound track to a audio-visual presentation for the local hospital as a public health education presentation. The program will be ultimately synchronized with a remote-triggerable 16mm film projector, and will be shown both on a still frame and continuous basis.

The various elements to be used would include:

1. Several pieces of music, placed throughout the show, many to be segued into each other.
2. An announcer for the running commentary.
3. Several actors: some in conversations, some alone, etc.
4. Sound Effects: hospital, sirens, emergency room, background noises, etc. These effects will run almost continuously throughout the show for added realism.
5. The sync track's pulse and drive to the slide/motion projector.

One might say, well, we can do this show very simply by mixing certain elements together and piece the entire show together by editing it. That's true, yes. But, if we want to obtain a realistic effect, we want to have the sound and picture as locked together as possible. By first laying down the sync track, and

track of our multitrack, as will the announcer. If we are doing an 8 track production effort, the remaining 6 tracks will work very much in our favor, and in the creative interests of the show. Consider the music programs to be used. At some points we may want to change musical program slowly, other times like

background noise of normal street and vehicle activity. This would make a transition, but NOT suddenly, into the background noise of the emergency room, with conversations, children crying, paging announcements, etc. By having several of these elements on separate tracks, the manipulation of them with

A well layed out track sheet can help you produce your show and save valuable time in searching out segments to be rebuilt or mixed.

CLIENT		PRODUCT							DATE
TIME	TRK 1	TRK 2	TRK 3	TRK 4	TRK 5	TRK 6	TRK 7	TRK 8	PICTURE
:00	Intro Music	—	—	—	—	—	—	SYNC Title	Opening Frame
:30	Intro Music	Anncr. Music	—	Announcer Opens Shows	—	Sirens	—	SYNC	Wide Shots of Hospital Complex
1:00	—	Anncr. Music and Fade	—	—	Street Noise	Sirens	Doors, Stretcher	SYNC	Ambulance
1:15	—	—	Doctor's Talking	Emergency Room Noise	Street Noise	Page System	—	SYNC	Emergency Room Activity
1:35	Low Elevator Music	—	Doctor's Talking	Emergency Room Noise	—	Page System	—	SYNC	Doctors Conference Over X-ray
								SYNC	

determining the exact length of the show, we may lay in additional elements on other tracks of the multitrack machine in exactly the right position with respect both to the picture and other audio signals.

The Details

The sync track will require only one

a switch. If we dedicate two channels of our remaining 6 for the music, and provide sufficient overlap between them, we may have a great deal of flexibility in deciding exactly where to perform the cross-fade between segments. In the multi-machine format, one will find oneself locked into a final choice earlier in the game than if one had used a multitrack machine, and decided in the final mix. The sound effects, too, may occupy more than one or two tracks. Having overlapping channels of sound effects creates a more realistic impression when the effects are mixed into and out of each other rather than simply keyed in and out. For example, if (as in our hospital presentation) a patient is seen being wheeled on a stretcher from the ambulance into the emergency room, we would expect to hear a siren, the opening of the doors of the ambulance, the stretcher being removed and rolled on the street, and behind all of this, the

respect to the picture is indeed a simple matter.

When we get into longer shows, instead of the radio or TV commercials, we may have several hundreds of effects, voices, etc., to be inserted into the multitrack tape before we are ready to do the final mix. When we insert these pieces we will want to be watching the film, and possibly retime their insertion a few times until the best mixture is achieved. The Sel-Syncing of SFX, voices, etc., into a multitrack tape is becoming a new production tool, and has dramatically increased the power and flexibility of the production engineer in creating a well-produced show.

Keeping Track of Tracks

Perhaps the most difficult thing to do in this method of production is to keep track of "What is where on what track" (continued on page 13)

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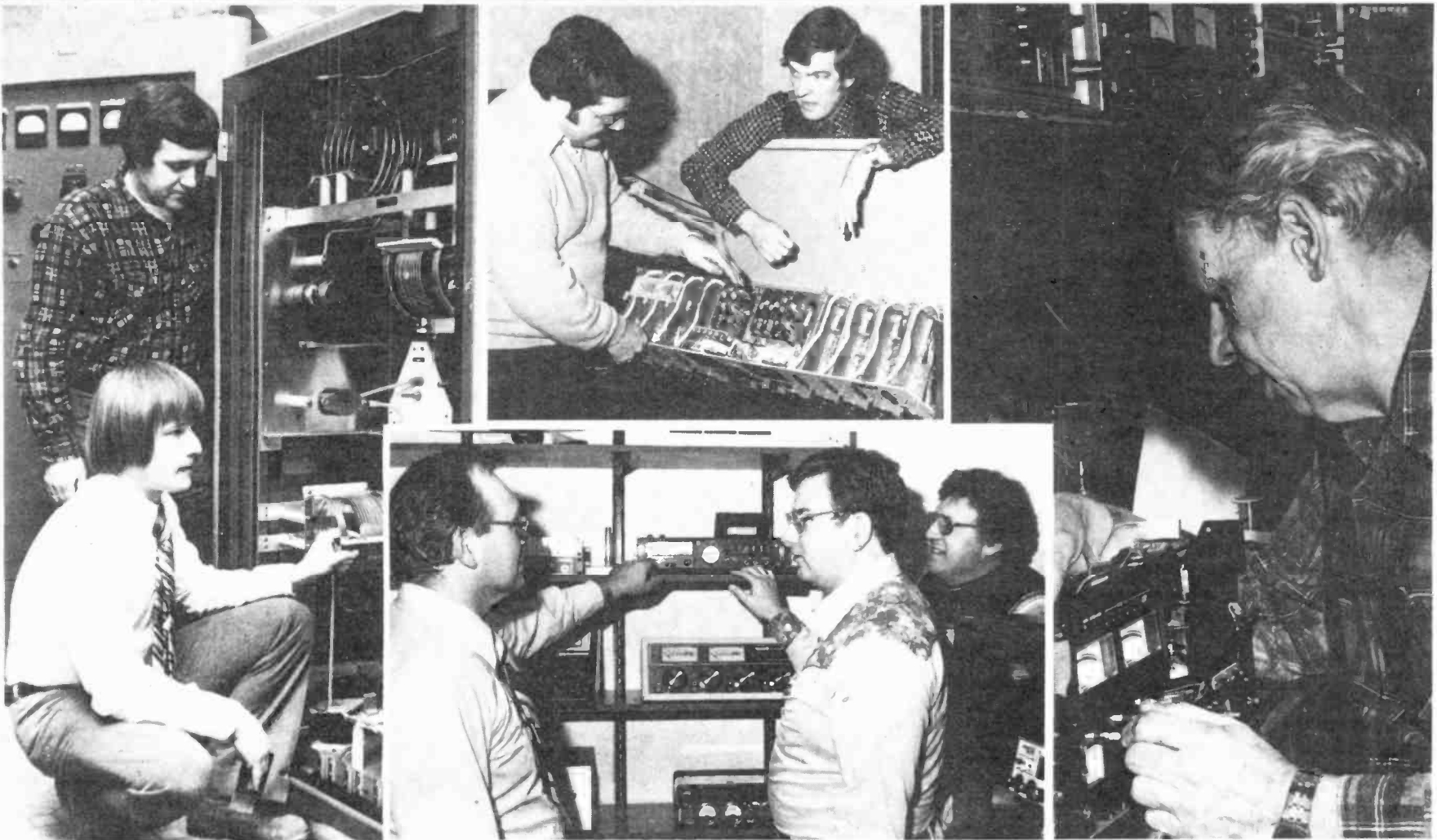
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SEE YOU AT THE NAB!

Bill Sacks on the Audio Process

Capacitor Basics

Arlington, VA ... This month, we are going to look at one of the most neglected sources of poor sonic quality, our old friend the capacitor. Since we're in the real world, and "ideal" capacitors do not exist, we have to look at the electrical equivalent of a capacitor which is quite complex. When one examines capacitors, here are a few factors one must consider:

ESR: Equivalent series resistance: this is the loss resistance of the leads, plates, and their bending to one another. Capacitors designed for use with high ripple currents usually have a low ESR.

IR: Insulation resistance: this is the dielectric leakage, and acts as a shunt resistor across the capacitor. This is most critical in timing cir-

cuits. Dielectric absorption (D.A.) is a critical factor in quality audio applications.

In audio circuits the capacitors have often been ignored as a source of transient distortion, and as a source of indecisive sonic quality. The worst offenders in this regard are most of the ceramics and electrolytics. In my opinion tantalum oxide is "grungier" sounding than some

aluminum oxide. Major factors causing this lack of clarity are the high DA and poor impedance vs. frequency curves.

Which Caps Sound Best?

Noninductively wound film dielectric capacitors have an open, transparent sound. Some good sounding film dielectrics are: polystyrene, polypropylene, parylene, and polycarbonate. All of them are fairly expensive with the exception of polystyrene, which sounds great but can easily be destroyed by flux cleaning solvents. Polyester film (mylar) is a fairly good sounding and inexpensive alternative to some of the exotic types listed above if the absolute capacitance value is not that important (they drift). The film caps are physically large (except Metalized Polycarbonate, and Metalized Polyester) and maximum capacitance values are limited to about 5 micro F. A piece of wire, of course, still sounds better than all of the above.

What to Do About Electrolytics

Electrolytic capacitors are the only practical method of obtaining large values of capacitance for low impedance circuits. Unfortunately, in many instances they are used incorrectly. They should be properly polarized, low ESR types. They also should be bypassed with capacitors exhibiting good high frequency characteristics. This applies to de-coupling as well as coupling caps. This entire subject was thoroughly treated in "Selection of capacitors for optimum performance" by Walter G. Jung, and Richard Marsh, presented as a 2 part series in "Audio" magazine in the February and March 1980 issues. (I also recommend reading a series in those two issues about T.I.M. by Robert Cordell.) I would like to thank Mr. Jung for his assistance in preparing this month's column. I suggest that one read the above mentioned articles and then try it. The audible difference quality capacitors make is astounding.

Corrections, Better Late Than Never

"Do we still need transformers?" by Bill Ashley contains a few errors concerning noise figures (see Dec. '79, BEE, page 2). Figures 1 and 2 mistakenly show the noninverting node of the input tied to ground, not quite a floating circuit! Also, a crucial resistor is missing; the resistor forms a voltage divider with the noninverting input resistor. It should equal the value of the feedback resistor, and connect from the op-amp noninverting input (pin 3) to ground, as shown in figure 4. Please note that these circuits were shown for illustrative purposes only, and are not intended as build-it projects. We will have "build-it projects" in future issues of BEE. One final note,

(continued on page 9)

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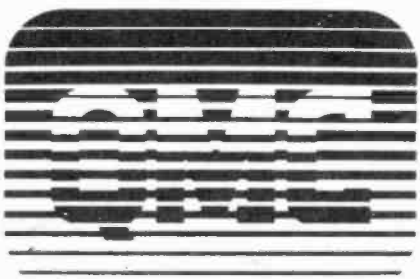
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WKDC Tests

(continued from page 2)

Blotter becomes quite enthusiastic at this point, stating, "The frequency response was fantastic and dispels the old engineering belief that AM Stereo will not sound as good as that other service. Stations properly equipped and engineered will be equal to any FM station anywhere."

Before he commits himself entirely as a Motorola standard-bearer, Mr. Blotter cites the results of yet another test conducted during 1979: "A considerably updated Motorola stereo exciter from the original 1976 model at WKDC was tested at clear channel 50,000 watt WGN, Chicago, with AM Stereo receivers in Iowa, Michigan and Minnesota. The

results of this test confirmed our earlier findings at WKDC, three years before." This final test, conducted by WGN, Chicago, seems to have won WKDC's support for Motorola. Frank Blotter, however, is careful not to allow partisan interests to deflect attention from what he believes to be the larger and more important issue: the shot in the arm that AM Stereo will provide for an ailing industry segment.

"The quality of AM Stereo is surprising, and will be a gigantic help to the AM business. When it is authorized, stations will not even have to advertise that much, for the automobile dealers will do it for the station, trying, of course, to sell as many car receivers as possible. One manufacturer is scheduled to start production of AM Stereo receivers as soon as the FCC decision is made. The same, I'm sure, holds true for the manufacturers of home sets and the dealers with the new AM Stereo receivers on their shelves. If a station does not go stereo when authorization is granted, it may be pretty embarrassing when the listeners ask, 'Are you AM Stereo?'"

Again, Blotter sidesteps personal preference, repeating, "I don't have any interest in any brand supplier, and cannot benefit financially from this, but AM Stereo will be great for stations everywhere. I'm just satisfied that I could give something back to the industry that has supported me for the past 45 years."

Cleaning Kit from TEXWIPE

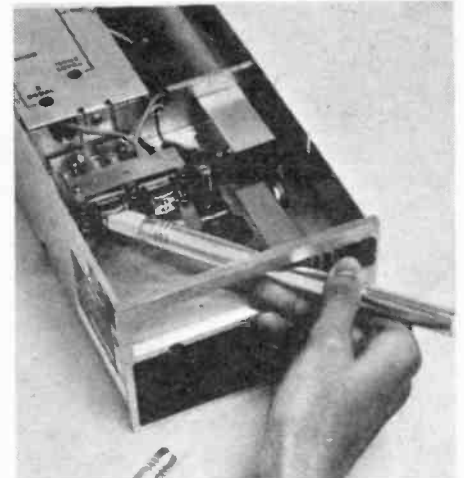
Hillsdale, NJ . . . Broadcast maintenance engineers are all too familiar with the difficult task of maintaining clean tape heads. Although many engineers use cotton swabs or pencils wrapped with cloth tips, the effect is often inadequate and sometimes damaging to the equipment. As usual, one of the most basic and simplest tasks has, for some time, been largely forgotten by equipment manufacturers.

No more. The Texwipe Co. has just come out with a new cleaning kit, custom designed for audio heads. Officially designated as Audio Tape Head Cleaning Kit, TX250, this handy little package contains everything needed to keep tape heads in peak working order, ensuring peak sound fidelity and a low failure rate. Priced well at \$27.50, the kit contains enough material for more than 900 cleanings.

The TX250 Kit contains two specially designed Audio Cleaning Pens, one for pressure rollers and one for heads. Each pen holds an adjustable, lint-free, absorbent Clean-Wick which can be cut to the exact shape needed to perform its special cleaning task.

Some of the other special components of the kit include a custom-blended electronic grade Audio Tape Head Clean-

ing solvent, ten replacement Clean-Wicks, a Clean-Wick Cutter for shaping the pen tips, a machine-tooled open-



front cartridge shell Pressure Roller to elevate the rollers into an easy-cleaning position, and a Space-Saver Rack to keep cleaning materials handy.

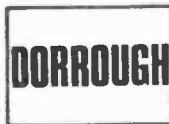
Not only do the TX250 Kit materials clean equipment; they will also clean oxides, dust, airborne contaminants, lubricant residue and oil from fingertips. For a variety of uses and a professional results, consider the Texwipe Kit. It looks like one of the best things to come along in a small package in quite some time.

Capacitors

(continued from page 8)

my V.U. meter amp build-it project diagram last month was abused by a layout artist formerly contracted by BEE to ink pencil drawings. The diagram was returned to us one day before we went to press, too late for corrections. We have a new artist, and hope to avoid this sort of thing in the future. Hot stuff next month, no (April) foolin'.

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International Equipment Representatives

Radio-A Unique Medium

New York, NY . . . Radio is not a "primary" medium. It is, instead, "fragmented," "invisible," "expensive," and "ineffective." Television, on the other hand, is "powerful," "persuasive," and "flexible."

This analysis only hints at the scope of

the current advertising campaign recently launched against radio by the Television Bureau of Advertising, an effort which virtually assails the would-be advertiser with dire warnings: "... we extend a word of caution . . . look out. The low out of pocket cost of a typical

radio spot may not be low at all if you know the audience you reach, and the 'low cost' radio spot can be very expensive if it doesn't produce results."

Radio broadcasters can only, in turn, issue their own warnings to those unquestioning believers in America's "primary medium": when it comes down to sales effectiveness, the biggest medium may not be the best. It may very well be true that people are listening generally less than before. However, it is also true that it is not reaching a large audience that determines marketing effectiveness, but rather, reaching the *right* audience.

Television no longer commands a universal audience. The viewing audience today has grown immeasurably sophisticated and critically aware. Commercial programming has, for some time now, been under attack for the low quality of its presentations and its limited appeal. The heavy T.V. viewer is profiled as working class, poorly educated, and at the lower end of the economic scale. He or she spends more time in the home, or, if employed, depends on T.V. as the main leisure activity.

The radio listener, on the other hand, spends much of his or her time on the

go, professionally and personally. Both work and play demand a dynamic lifestyle; higher wage scales permit a variety of recreational options and leisure activities. Men and women engaged in kinetic and well-defined life patterns *select* stations, channels, programs, and they select a medium that travels with them—radio. Radio, then, inherently provides a programming option that many viewers are now demanding of television—market segmentation.

No longer can the T.V. advertiser be assured that the audience he reaches is an audience that will be interested in his product. The effectiveness of T.V. advertising actually decreases during the second and third quarters of the year, times when the bland program offerings become the most unpalatable, consisting, as they do, of stale reruns and tasteless pilots. Radio, instead, remains vital throughout the year, catering to a discriminating, four-season audience.

Radio is less expensive, more flexible and, most importantly, adaptable. If handled gently this under-estimated medium may soon outdistance its large and unwieldy competitor. Radio is, after all, *red hot*.

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hours of listening and research was it understood how and why the unit worked. This understanding plus hundreds of hours of studio application led to the present model, the EX2, with its four enhancement settings. The EXR EXCITER restores natural presence, clarity, fullness and individual instrument definition lost in the reproduction and transmission process. It adds to the apparent

signal strength without noticeably triggering limiters or compressors, and its S/N ratio of better than 90db makes it welcome in any audio application. Since there are no multiplier effects or phase problems introduced to the broadcast chain, the EXR EXCITER is totally compatible with previously enhanced program material.

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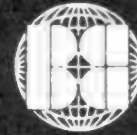
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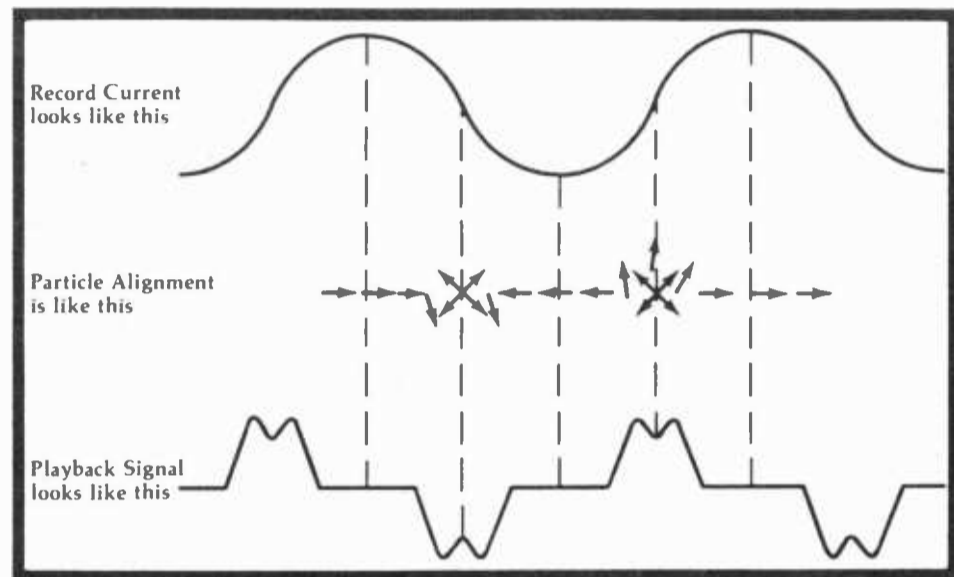
What About the Control Track?

Knoxville, TN ... A good friend asked me why the control track signal is distorted in playback while in record it is a sine wave. He also asked me to explain the R & X circuits in RF playback amplifiers. The control track question is easier and I'll study R & X.

In record an AC signal derived from the headwheel tach or tonewheel is recorded by an unbiased low frequency

When the AC signal passes through zero, or has low energy, the particles have a less absolute alignment. In playback it is always the changing alignment of magnetic particles that produce signal current in the transducer.

In order to have a control track signal which is suitable for controlling capstan phase, it is necessary to have a tuned amplifier which is phased by the incom-



transducer on the bottom 1/16th inch of tape. Recording any AC signal without bias produces a highly distorted recording. Consider the following: When the AC signal is positive, the magnetic particles on the tape are aligned in a horizontal direction with all North and South poles in parallel. When the AC signal is negative, this alignment is reversed.

ing control track playback signal.

After my explanation, my friend looked at me blankly and asked, "But why is the control track signal distorted?" "It has no bias," I begged. "I know that," he said, "but why is that; why does it have no bias?" "Oh," I said, "you want to know why the control track signal is distorted; hmmm, where is that R & X circuit?"

Reader's Forum

(continued from page 4)

of how much \$\$ the seller wants for his equipment. Also, not publishing prices makes it impossible for "bargain hunters" like myself to hunt same!

If it were my publication, I would REQUIRE that ALL ads state prices IN THE AD!!! No price given ... no ad. This isn't unreasonable; many newspapers require that the seller publish the price in order to run the ad.

The key code list is enough of a hassle! Put the prices back in the paper all the time so that ALL BEE readers have a fair chance to buy and sell!

Keep up the good work ... we need BEE!

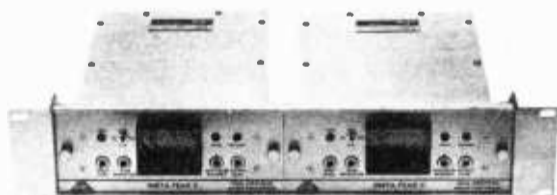
Hank Landsberg
Drake Chenault Ent.
Canoga Park, CA 91304

BEE Replies:

We appreciate your concern, Hank, but as Jack Vobbe's letter (and many others we've received over the years) says, BEE moves equipment. We certainly agree that sellers should include asking prices, but remember, many people don't know what the right asking price really is in the market. In fact, we have been asked by a number of people to publish an annual "Blue Book" on prices realized for equipment listed in BEE each year. It's not a bad idea, except the costs involved in putting it together might exceed the revenues from selling the "Blue Books." We have noted that about one-third of the listings come in with asking prices, but we cannot state that these items are sold any quicker than the ones that come in without asking prices. We simply don't feel that we can insist on an asking price without putting some of our readers in an untenable position. All we can say is if you have an asking price in mind, please list it!

THE SUPER MODULATION AUDIO PROCESSING GROUP

• THE INSTA-PEAK II • THE LEVEL GUARD • THE WIDE BAND LIMITER •



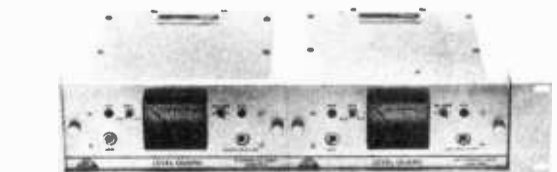
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- AM and FM Response Shaping



Wideband Composite Limiter Model WBL

- Stops all stereo filter and pre-emphasis wave-form over-shoot
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Good audio processing does not have to be expensive and complicated. ESP products are value engineered, have operational simplicity and are maintenance free. Prices start at \$495 for the WBL-1, the original wide band composite limiter. The "Level Guard" \$545, the "Insta-Peak II" \$575. Add second unit for stereo applications.



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QSC Files Three Amplifier Patents

Costa Mesa, CA . . . Three patent applications have been filed for QSC Audio Products' recent line of pro-audio power amplifiers. According to Patrick H. Quilter, chief designer, the circuitry embodied in the patents gives the QSC amplifiers several advantages not available in other amplifiers. These benefits include full protection against short-circuit loads of any duration, without loss of audio performance; protection

against DC and sub-audio faults without unwanted audio shut-downs; stable high-frequency performance, improved transistor cooling and increased overall reliability. Mr. Quilter describes the specific improvements as follows.

"One major problem in designing reliable pro-audio amplifiers is to assure protection against common mistakes and accidents. Shorted speaker cables can cause unprotected amplifiers to fail in-

stantly, so short-circuit protection is vital. There are numerous electronic protection circuits, but most of them detract to some extent from maximum audio performance, particularly into the heavier loads. Thus, some companies choose not to use protection circuits, thereby increasing the chances of catastrophic amplifier damage. Other companies prefer to fully protect the amplifier but must accept that some excess distortion may

appear during heavy peaks, as the protection circuits begin trigger. Our approach relies on a two-stage protection. Full-time electronic limits are used, at a level high enough to pass full-power audio, but adequate to protect the output transistors against instant failure."

"If the short persists, a second level of protection comes in, which cuts the limits to a lower value, safe for any length of time. This second level of protection cannot be triggered even by highly reactive speaker loads, so full audio performance is maintained without loss of protection when actually needed."

Low cut-off

"Another basic problem with modern, direct-coupled amplifiers is that there is not inherent low frequency cut-off to the speakers. If a power transistor fails, the amplifier can destroy speakers with raw DC power. The usual solution is the DC protection relay or crowbar circuit, which acts to remove power after detecting a DC fault. Unfortunately, the circuits either tend to false-trigger and cause unwanted shut-downs or may fail to act on major faults. Our second patent addresses this problem by describing a re-arrangement of the basic power supply components. We are able to retain all of the well-known audio advantages of modern amplifiers, while eliminating the DC path to the speakers. This provides fool-proof DC and sub-audio speaker protection, while also eliminating the false-triggering problems."

"Our third patent describes the basic, overall circuit which we developed for our amplifiers. In combination with the developments covered by the other patents, we have achieved an optimal, greatly simplified design which enhances overall reliability, allows us to direct-mount the power transistors to the heat sinks for better cooling and, which offers excellent high-frequency performance without the need for dangerously high slew rates. The net result is clean, stable operation, without the occasional ultrasonic oscillations and blown tweeters which plague some of the "high slew-rate" designs."

"We have combined these major developments with many other improvements and features which we think add up to unmatched performance. These circuits are used in all nine current QSC power amplifiers."

Sony Caters to Religious Market

New York, NY . . . The religious broadcasting market is large, economically powerful and ready to invest in an all out campaign to promote, via radio and television, Christianity. The most common complaint voiced by the religious market is that they have not been allowed, in the past, to buy. Prime time as well as industry attention has been reserved for the commercial stations, the stations that belonged on radio and television, the stations that drew the advertisers. Everyone underestimated the broad appeal of a product whose main pitch is that you really can go around more than once.

The recent NRB show held in Washington, D.C., demonstrated the vitality of the religious market as well as the meager response of suppliers to the special needs of this market.

One Company's Approach

One of the most prominent manufacturer's display at the NRB show was hosted by Sony, a company which seems

to be among the first to recognize the unique nature of the religious market, to understand the special physical needs of that industry.

BEE recently spoke with Sony's Irwin Ungerleider who confirmed his company's interest in and commitment to the religious market. Ungerleider explained that Sony has three separate product areas which are directed toward the needs of religious broadcasting: 1) an industrial line featuring the Beta-max film projector, the Super 8 telecine; 2) a full blown broadcast line, featuring

a compact editing system; 3) a line of gang duplicators especially geared toward the needs of the religious broadcast station.

Mr. Ungerleider spoke at length about the concerns of religious broadcasters and Sony's interest in their development. He assured BEE that Sony's efforts to deal with this market had just begun, and that his company would be involved in further research, aimed at understanding not only the physical needs of the religious market, but also the forces which have led to its commercial success.

March FCC

(continued from page 5)

channels, if a Class A channel is not available; to add two new classes of stations—Class E-1 with maximum facilities of 20 kw antenna height, 92 meters above average terrain, and Class C-1, with maximum facilities of 100 kw, 305 meters antenna height; to permit

Class B (B-1) facilities in Zone 2 to require that all existing Class B and C stations meet certain operating minimums for power and antenna height or be subject to reclassification to a lower class channel; to adopt a new separation cable to reflect the updated propagation curbs. If you are interested in filing comments, they are due June 13.

(continued on page 23)

How to become a SUCCESSFUL CONSULTANT in your own field.

Have you ever wished you could quit your job and start working for yourself?

Well, maybe you can! Many people are amazed when they discover the tremendous amount of professional experience and specialized knowledge they've accumulated — experience and knowledge that others will gladly pay for. Literally thousands of people who made that discovery are now prospering as independent consultants.

The way to begin is by reading *How to Become a Successful Consultant in Your Own Field*, by Hubert Bermont.

Clear, straightforward, packed with solid information and advice, this authoritative manual tells you everything you need to know to establish your own independent consulting practice. Here's a sampling of the contents:

- What does it take to be a successful consultant? (See Chapter 1.)
- How to get started (See Chapter 3)
- How to operate your business — a collection of "tricks of the trade" (See Chapter 5.)
- What to charge your clients — plus five helpful rules on fees. (See Chapter 6)
- Why you should never work on a contingency (speculative) basis. (See Chapter 7.)
- Ingenious ways to promote yourself — and make people want your services. (See Chapter 9.)
- Contracts: why you should avoid them at all costs (See Chapter 10.)
- Just what do consultants do all day? (See Chapter 11)
- How to market your ideas. (See Chapter 11.)
- Why you'll never have to worry about competition (See Chapter 13)
- And much more!

Perhaps no one is better qualified to have written this book than Hubert Bermont. He has served as consultant to more than 70 major corporations and trade associations, including the U.S. Chamber of Commerce, McGraw-Hill, the Electronic Industries Association, Evelyn Wood Reading Dynamics and the Smithsonian Institution. Yet he made the decision to become a consultant only after being fired from an executive position at the age of 43. You'll learn first-hand how he did it — and how you can do it, too!

How to Become a Successful Consultant in Your Own Field is just \$20 (tax-deductible if you use it for business purposes), and you're fully protected by this unconditional money-back guarantee: Keep the book for three weeks. If you're dissatisfied with it for any reason whatever, simply return it and every penny of your \$20 will be promptly refunded — no questions asked!

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on page 15 . . .
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Production Recording

(continued from page 6)

and when?" When hundreds of voices and elements are combined into 8 (or more) channels, in various planned cross-fades, jumps, or what have you, even the most sober-minded engineer can become befuddled. One possible solution to this is another take-off from the multitrack recording industry, but with its own set of refinements: the track sheet. In a fairly typical 24 channel record session, usually, each channel has one instrument on it for the length of the song, and that's it. So a simple chart of Track # and Instrument is all that's necessary. In our example, though, one track may contain 15, 20 or more pieces, constantly changing throughout the piece. A modified track sheet, describing in detail would be of great benefit.

A simple way to do this is to break the show into several time slots, each of approximately 30 seconds, (any will do, depending on how often things change) and put on one column of the track sheet the time listings. If one special time or more is critical, and not on the half-minute, be sure to add it too, especially if many elements change there. The next set of columns would be the individual tracks, containing the various narratives,

ie: announcer, doctor's talking, sirens, etc. Two points can be made here that will be invaluable to the production engineer involved in many of these projects: on each entry to the Track sheet that is made while the elements are being added into the tape, have a listing indicating, either on the entry itself or on a separate sheet, the source of the element. If the SFX come from the BBC record library, then list the Disc #, track, etc., so one can always go back to it instantly. Music libraries should be referenced as well, as should any original recording done in one's facility or from outside tapes.

The last column of one's track sheet only applies if one is doing anything to picture. Indicate what is happening on the film in this column. It results in an easier reference for finding places in the tape and film for mid-show cueing. If the film has a frame counter on it, that will, of course, work fine.

There are many ways in which to do a complex audio/vidual show, and this is only one way. But for the small studio owner who wants to get involved in some aspect of the production industry, we have, hopefully, demonstrated that

New Mexican Affiliate

La Jolla, CA ... In order to meet the extensive demands of its Mexican and Latin American clients, *Broadcast Equipment Exchange* has affiliated itself with International Equipment Representatives, Inc., a new and flourishing export management company headed by Luis Carrillo.

Carillo, ex-CEO of radio stations X-TRA-AM, XEROK, and Chairman of the Board of five companies in Mexico, claims that one of the main advantages that his company will have over its competitors is that the I.E.R. sales staff will visit all stations and recording studios of

his existing music facility is quite sufficient for the job, and often even more desirable than the mono-stereo format.

Last month I received a couple of letters from some suburban NY students who were interested in getting into the music field. They had little experience, just the home stuff, and wondered if production engineering might be a way to get started. I spoke to a few studio owners, who go through the "No-Experience-No-Job Catch 22" of our industry and they had some insights which may prove valuable to those newcomers to the field. Until next month....

the Republic of Mexico at least ten times a year.

In the past, manufacturers have been faced with several problems when trying to deal with the Latin American market: cultural and language differences, credit and/or collections. Since I.E.R. is an American corporation, its home office in California, many of these problems can now be circumvented. I.E.R. will work with the manufacturers to review their marketing plan for Latin America, and then recommend the necessary adjustments to ensure increased productivity.

I.E.R. will also collaborate with their representatives to prepare the necessary literature in Spanish and distribute it to the consumer in the most effective way. At NAB/Las Vegas, bilingual engineers representing I.E.R. will visit and translate for Latin American visitors at the manufacturers' separate booths.

BEE enters into this new relationship with confidence and high expectations. I.E.R. should provide a valuable service to manufacturers and clients within this country and in Latin America. Welcome aboard, I.E.R.!



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Si necesita equipo usado a precios razonables para su estación, nuestro personal bilingüe le proporcionará directamente toda la información del equipo que se anuncia en esta publicación.

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International Equipment Representatives

Circle 115 on Action-gram.

ACTION-GRAM

APRIL 1980
USE BEFORE
JULY 1980

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4/80

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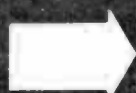
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March FCC

(continued from page 12)

Petition to Deny Process

The FCC denied a request for rule-making filed by NAB and NRBA asking that the petition to deny process be revised so as to eliminate petitions that are inconsistent with the requirements of the Communications Act. The FCC felt that if it implemented the suggestions submitted by NAB that this would necessitate an additional round of pleadings and might further delay the entire process. Instead, the licensee can make

its own threshold determination as to what issues raised appear to have substance and which are frivolous.

Ascertainment Checklist

The FCC modified its "Other" category on its checklist to insure that all significant elements and institutions in any particular community are contacted by radio and TV renewal applicants. Thus, persons who do not fall within one of the 19 categories now specified in the checklist would have the burden of contacting the local broadcaster so that it can decide whether that group is

significant in the community of license. This rule change was brought about by gays and handicaps who felt that they should have specific categories in the checklist.

Minority Ownership Policy

Station WDRK, Greenville, OH, petitioned for rulemaking to require the Commission to maintain a position of neutrality regarding all persons making application to it with no particular benefit given to anyone due to minority status. However, the FCC felt that it was still proper to award merit in a proceeding involving a minority owner-

ship, where such ownership was likely to increase diversity of content.

Comparative Application

The FCC denied an application for a new FM in Hattiesburg, MS, because of the affects of an earlier decision denying the renewal of Station WSWG AM/FM, Greenwood, MS, of which one of the applicants' principal was a 25% stockholder. The Administrative Law Judge felt that his application was not entitled to comparative consideration because of the serious nature of the issues in that other proceeding.

AM Stereo

(continued from page 1)

were changed, the end result (ie: Magnavox having the highest score) might also change. Middlecamp responded that he felt the performance scoring and weights could be justified, but the data was not made available to BEE for further analysis.





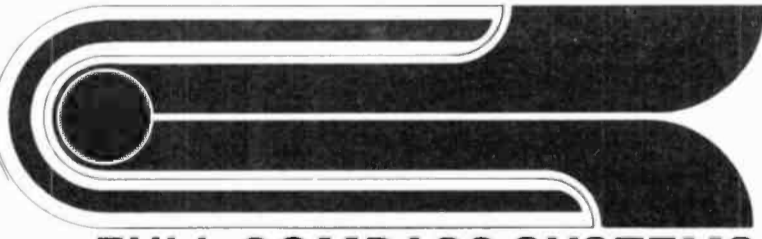
The Vote


Commissioner Quello brought the matter to a head by asking for a vote on the matter. The Commissioners then voted 4-2 to direct the Broadcast Bureau to recommend a single system, and present that recommendation to the Commission. It was left unclear as to whether the Broadcast Bureau had to go along with the Science and Technology recommendation of the Magnavox system as the system to recommend. Chairman Ferris, when questioned by BEE, would not clarify this point, but he did leave the impression that the Broadcast Bureau's recommendation would be approved quickly. Commissioners Brown and Jones, who dissented, said that they would publish statements on the reasoning behind their positions, but these statements were unavailable immediately after the session.

One thing that seemed clear was that the broadcaster's input from extensive testing (as reported in BEE, etc.), was not of great concern to the Commission. There was no mention made of who tested which systems, and what they felt were the relative merits of each system. The Office of Science and Technology, until it shows otherwise, presumably made its evaluations based on its own analysis, and not the broadcasters. The Broadcast Bureau's original position, which in essence approved all five systems, would have had the effect of getting AM stereo off the ground immediately. By insisting on the approval of a single system, the Commission may be putting those of the proponents who are ultimately rejected in the position of bringing suit in the Court of Appeals, under the Administrative Procedures Act. This, of course, will do nothing but delay the introduction of AM stereo, for perhaps another few years.

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