Smart Magnecord Users Place High In Audio Devices Sound Contest

We have always contended that Magnecord users were the smartest people in the world. Proof of the contention is in the results of the recent Audio Devices' sound recording contest.

Of the twenty prize winners, fifteen mentioned the make of recorder. Ten of recorded simultaneously at the control room and at the transmitter. A time announcement starts each break providing a definite cue for the correct playback.

"This procedure immediately frees the announcer for other duties. The playbacks are usually run off in the control room. However, when another program is scheduled for recording, the transmitter operator runs off the 'break.' This makes it possible for the control operator to give undivided attention to the recording.

"Our FM station relays most of its programs from a music network. Chain-breaks are recorded and played back at the transmitter. This makes it possible for one man to perform the complete operation.

"Recording programs for later use is a large part of the schedule. Performers and the control room can arrange for recording at the convenience of all concerned. Most important, too, is the finished end result. Should a musical group find, for example, that the third selection was not quite up to their standards, then that selection can be done over on another length of tape and inserted by editing into the proper place instead of the defective performance.

Should a program run too long, judicious use of the shear can be employed to clip out a chorus or other portion, so

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Cordette Christmas

The Magnecord advertising department has been urging, ad-wise, that there is no finer Christmas gift to the high fidelity enthusiast than a Magnecordette.

They're right!

The Magnecordette was designed for the high fidelity enthusiast. It features a recording amplifier and pre-amp playback. It was designed with the thought that any high fidelity enthusiast already has a quality power amplifier and a good speaker, and duplication would be unnecessary.

The mechanical unit, the tape transport, is the same PT6-AH unit which has become the standard in broadcast installations. The PT6-G amplifier has an extended frequency range of 60 to 15,000 cycles +3 db at 15 inches per second tape speed, and 50 to 10,000 cycles +3 db at 7½ inches per second tape speed.

There's no finer recorder for the high fidelity enthusiast than a Magnecordette!

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Clever Magnecord Users Are Contest Prize Winners

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prize winning paper in the Audio Devices sound recording contest, Jesse C. Durham, technical director of the Armed Forces Radio Service in New York, described an ingenious and practical method of editing without cutting tape.

That a tailor-made program results. Microphone placement, balance and other acoustic problems can be arranged to the satisfaction of all concerned.

A small but somewhat difficult problem for the average station is in the producing of an "echo" for dramatic work. A very effective "echo" was developed at WDRC by using an extra head. To get the effect, it is necessary to record the program on tape. The extra head is used as close as possible following the record head, to pick up the material just recorded, and it is fed back to the mixing panel where it appears delayed by about 1/15 second. The "echo" is fed back into the program and the amplitude and duration is controlled by the mixing gain control.

The recording equipment at a station can vary to suit the programming needs. The main recording bay at WDRC consists of two Magnecord tape units and amplifiers, one large reel mechanism, a monitoring amplifier, a speaker, jack strip and selector switches. A five-position rotary switch selects the desired program by bridging various studio units.

Vertical keys that are program interlocked to prevent two programs getting onto one recorder, select the recorder. This provides for continuous recording or playback, simultaneous recording of one program and playing back another, playing back of two programs at the same time on AM and FM, and for recording a program in duplicate. The rest of the tape equipment is a binaural unit, portable and battery units and a recorder at each transmitter.

Two of the three announced second prize winners also used Magnecords. The other did not specify. In his second

Lyle Thompson, chief engineer of the John Keating Company, Seattle, Washington, checks the automatic starter for company Magnecords described in his prize-winning paper on "Automatic Start for Taped Programs."

The advantage of the unique method is an instantaneous system which allows airing of a completely edited show a short time after its performance. The process is used daily by the Armed Forces Radio not only for economy of operation and saving of editing time, but to present a much smoother show.

For the operation of the instantaneous editing process Two MagneCorders form a continuous loop, and a third records the final edited show. It's operation is shown in the accompanying diagram. Normal switch "B" is closed feeding the program through the amplifier to the recorder after a second delay on the tape loop. The tape machine remote control switch is closed and the machine is running, recording the program. The operator leaves the monitor switch "A" in position to listen to the direct feed (without the six second delay).

When the operator hears the beginning for a program segment he wants to edit, he thinks back to determine the cue point beginning this segment. Then he flips switch "A" to monitor the delayed feed and waits for the cue point. When the cue point is reached, the operator opens switch "B" and stops the tape machine with the remote control switch. He immediately goes back to the first position to pick up a cue point for the end of this program segment.

When the end cue is determined, the operator goes back to a monitor position at the end of the time delay. When he gets his cue, he again closes switch "B" and resumes recording. The operator then goes back to monitoring the direct feed to be ready for the next program elimination.

At AFRS the editing system is used to tailor athletic events to a definite time block. The Armed Forces rely heavily upon commercial radio and television programs but, at the same time, can recommend commercial products. Without the instantaneous editing system there would be a laborious and almost impossible splicing job.

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UNITIZED CONSTRUCTION

The Magnecord M80 features a "unitized" construction. Each assembly is independently removable for service. Each assembly, although completely integrated with the other assemblies, functions as a complete independent unit.

The assemblies are:
- Two reel motor and brake assemblies
- Capstan drive assembly
- Stabilizer roller assembly
- Head assembly
- Front panel assembly
- Push button control assembly
- High frequency bias erase oscillator

TAPE DRIVE SYSTEM

The drive system of the Magnecorder M80 consists of the two reel motor and brake assemblies, the capstan drive assembly and the stabilizer roller assembly. Unique design makes this unit the most positive tape transport mechanism.

The stabilizer assembly of the pressure roller consists of a flywheel, a tape roller and a bearing housing, as well as a compliance arm guide. Precision ball bearings are used as both ends of the roller shaft. This assembly eliminates effects of tape sticking and high frequency flutter in the pay-off reel.

CASCADE STAGE

To improve the signal-to-noise ratio, Magnecord engineers J. Lee Price and William F. Boylan went outside the audio and recording field as it is recognized. Most of the recent work in improve the signal-to-noise ratio has been confined to improved design of existing methods. However, maximum results through refinement have been attained.

Price and Boylan went to the work done during World War II in research for a low noise ultra high frequency amplifier for radar by Dr. Henry Wallman, professor at Massachusetts Institute of Technology. Wallman and his fellow researchers at MIT developed a "CASCADE STAGE" also known as a grounded grid triode circuit.

Wallman's problem was to develop an ultra high frequency amplifier, more complex than an audio amplifier. In ultra high frequencies absence of atmospheric noise such as static, emphasized amplifier noise which became the limiting factor. Two tubes were connected in series, and the maximum gain of the first was used to over-ride and cushion the noise of the second without resistors which themselves introduce noise.

The basic cascade circuit, as adapted by Price and Boylan for the Magnecorder M80 amplifier, consists of a grounded-cathode triode feeding into the cathode of a grounded-grid triode.

With this circuit arrangement, the upper tube has a fixed DC grid potential at AC ground. This tends to hold the lower triode plate potential fixed, but permits its current to flow in a load resistor. The behavior is similar to a pentode with the advantage of having no screen current and its accompanying partition noise.

The output conductance of the first tube is of the same order of magnitude as the optimum source conductance for the second tube, so the full power gain of the grounded-cathode triode is utilized. No physical coupling resistances are needed, and effective isolation of input and output circuits and low input capacity result in minimizing the effect of noise.

The cascade was further modified by use of a "grid leak" or "contact potential" bias in the upper triode. With this biasing method tube variations have very little effect on the biasing of either triode.

Omaha Newscaster Double-Tapes Trial

Intense public interest in a recent gory, double-murder trial in Omaha demanded unusual coverage by Station KFAB, Omaha. Hugh McCoy, KFAB Newscaster, received permission from the trial judge "in a precedent setting decision" to broadcast directly from the court room.

A method of double-taping using two sets of Magnecorders was devised by Al Bates, KFAB chief engineer. McCoy's report of the two and one-half hour testimony was taped on Magnecorders in the stations mobile transmitter. At the same time, the reporting, via a microphone strung through a window to the mobile unit, was transmitted to the station where it was recorded on the station's Magnecorder installation.

Hugh McCoy, featured newscaster, KFAB, Omaha, (left). Chief Studio Engineer Al Bates inside mobile transmitter unit operating Magnecorders.
Chrysler Relies On Magneicorders In Automotive Sound Research

Auditioning sounds in a noise-proof laboratory is the newest step in automobile engineers' quest for ever quieter motor cars.

The Chrysler Corporation Engineering Division has developed a procedure for tape recording car sounds and playing them back to a jury of "ears"—to determine motorists' reactions to noise levels, which cannot otherwise be measured in terms of human hearing.

According to L. M. Ball, who heads the division's Electronics Laboratory, the system grew out of "a realization and appreciation that noise is a subjective, a psychological, an individual experience. The way in which human beings react to noises is not something that can be plotted readily on a chart or shown on a meter to measure noise, such as a decibel meter."

So Chrysler engineers place sensitive microphones and Magneicorder binaural recorders in Plymouth, Dodge, DeSoto and Chrysler automobiles under test, locating the mikes at drivers' or passengers' ear levels for record sounds in a car as an owner would hear them. They also record specific sounds for special evaluation by placing the microphones in localized areas such as under the hood to detect engine noise, or adjacent to wheels to pick up pavement rumble.

The resulting recordings go to the "sound jury." This body of engineers, designers, and selected "average driver" types (both men and women) then gather in a room especially constructed for sound work. They listen to the high-fidelity tape recordings played over reproducing equipment of the finest kind available. (Magneicord)

In rapid succession they hear, over and over again for comparison purposes, the recordings greatly amplified. Comparative wind noise, wheel rumble or fan noise produced by different types of construction or design, thus amplified, can be easily and accurately compared.

Mr. Ball explained that noises which may show very little difference as far as a decibel meter is concerned, make widely varying impressions on listeners if they are heard in an automobile in motion. Yet, in the noise-proof laboratory all the auditors will agree that of two sounds, between which the meter seems to make little distinction, one of them may be acceptable and the other may be unpleasant.

As an example, he said, in one test of a cooling fan, an increase of only about five per cent in fan speed made a substantial difference to the listening jury, but the decibel meter remained relatively unimpressed.

The sensitive tape recordings clearly reveal to Mr. Ball that, in making changes to reduce the sound level in a car, it is the combination of the changes that counts and not necessarily any particular one of them.

Mr. Ball pointed out that engineers have learned from the auditions that they rarely make changes that reduce sound in big bites; instead the work may be a painstaking effort in many directions, each change contributing to the whole and often achieving a far greater improvement than the promise held out by the changes individually.

Magneicorder Named All-American at VPI

Manufacturers are not ordinarily a sentimental lot. Maybe it's football, All-Americans, Homecoming and Homecoming queens. At any rate we're feeling like a happy Dean welcoming old grads and hearing of their progress.

We were put in this frame of mind by a very nice letter from Virginia Polytechnic Institute. V.P.I. purchased one of the first complete Magneicord dubbing set-ups with two D-3 dubbing amplifiers, seven PT6-6-AH recording mechanisms, and a PT6-J amplifier.

According to R. D. Michael of the Virginia Agriculture and Home Economics Service, V.P.I. makes thirty tape duplicates each week to service Virginia radio stations with five or six five-minute talks by V.P.I. experts in the Extension Service.

The PT6-J amplifier is also used to pump a daily 15-minute live broadcast to Station WDBJ in Roanoke, forty miles from the campus.

"It's nice to hear of you ..."