

NAEB NEWS LETTER

Office of Executive Secretary
Urbana, Illinois
February 15, 1939

LET'S GO

The membership drive is on.

It is our hope that every NAEB member will secure at least one new member or associate member for NAEB.

There are a number of educationally-owned stations who are not now NAEB members, but who should be.

There are many educational institutions who broadcast educational programs and who are eligible as associate members.

With this issue of the News Letter you will find two copies of the revised NAEB Constitution. Read it over, then pass along a copy or two to a prospective member. If you will let the executive secretary know, he'll be glad to write a follow-up. Let's increase the membership NOW.

EDUCATIONAL STATIONS ON THE MARCH

Just look around you and see what progress is being made by the educationally-owned and operated radio stations. Your executive secretary has had an opportunity to visit such within the past month.

At WHA, Madison, Wisconsin, we found Mac McCarty and Harold Engel going their usual progressive rate. We brought back with us not only material for the NAEB News Letter and packet (which incidentally don't overlook), but a conviction that Wisconsin citizens are getting some mighty fine programs. Too, the facilities are always being bettered. You'll recall that Wisconsin has a pending application for full time operation and 50,000 watts.

In Minneapolis, Minnesota, we saw the beginnings of Burton Paul's new lay-out in the ground floor of one of the University buildings. The floor is being entirely reconstructed, including acoustical treatments, air conditioning, etc. Studios, control rooms, and offices are all provided in the new area.

A new building is going up at WUI, as you'll recall from past News Letters. At Ames, Iowa, there is a new antenna, and soon there will be a new 5 KW transmitter.

Gilbert Williams of WBAI, Purdue, says plans have been completed for new studios and other facilities for his station in Lafayette. Soon plans will be made available for distribution to NAEB members.

No doubt there is much other valuable information which substantiates the opening paragraphs. If you'll send it along, it will be included in future NAEB letters.

PRACTICAL REQUIREMENTS FOR RECORDING EQUIPMENT

By Mr. E. D. Peterson, ElectroSound Products, Inc.

Editor's Note - This article, by Mr. Peterson, is based upon some of the remarks made at the Kentucky convention and was prepared especially for N.A.E.B. members.

1. **TURNABLES** - This unit should be fabricated from material that will not bend or warp so that the surface presented to the record is substantially flat and parallel to the line of travel of the cutting head. It is practical to fabricate a turntable that will not vary more than plus or minus .003 of an inch in any direction while being rotated. It should be heavy enough and so designed that it will not easily vibrate or ring or rumble when receiving a slight mechanical impulse.

2. **TURNABLE BEARING** - Ball bearings or roller bearings have not been successful to date for this purpose because of the rumble they introduce. A 16" turntable should have at least a 1 inch diameter shaft and a bearing about 4 inches long. The weight of the turntable is usually received by a large ball at the lower end of this bearing. This ball should rest on a glass-hard flat surface so that it will not form indentations as the ball in rotating will raise and lower slightly causing a vertical displacement of the turntable, which in extreme instances, may result in a thumping sound in the recording.

3. **LATHE** - The cutting head carriage should be designed so that there is a minimum chance of any lateral play; that is, when the cutting head carriage is engaged with the lead screw or any device, the cutting head should not have any perceptible movement in either direction of the movement of the cutting stylus. Needless to say, the bearing surface the carriage rides across the record on should be smooth and not function as a lead screw as well. This would require the carriage to ride on a threaded rod which would wear it and allow the gradual development of side play in the cutting head. The assembly that guides the cutting head across the record should be within $3\frac{1}{2}$ inches of the center of the table or in line with the center of the table so that any play in the guide rods or any other assemblies used to control a lateral travel of the cutting head will not be unduly amplified. The lead screw should have as many threads to the inch as possible as this will in turn drive the cutting head at a more uniform speed. It is also very desirable to have the carriage engage as many threads on the lead screw as possible to eliminate uneven spacing of lines due to any irregularities in the lead screw. It is very important that everything contributing to the irregular spacing of grooves, as an irregularity of only .001 of an inch may drop the maximum permissible recording level as much as 10 DB., some means of easily adjusting the angle are readily obtained. The mechanism that drives the lead screw should be so arranged that it will reverse the motion and change the speed of the lead screw. This will allow the cutting of records from inside out or outside in and at variable lines per inch with one lead screw. The better machines now incorporate a line spreader as standard equipment. This is a very useful device for indicating the exact location of any passage on a

recording as well as being a means to prevent overcutting on passages of high level.

4. TURNTABLE DRIVE - A synchronous motor has been found satisfactory for driving this unit. Several means of coupling the motor to the turntable are in use; namely, belt drive, rim drive through a rubber idler wheel, and direct gear drive. The belt drive and the rim drive are usually the most satisfactory from the point of not introducing a rumble in the turntable, which shows up as a pattern in the record as well as being audible in the recording when low level passages are being reproduced. The direct gear drive will revolve the turntable at exact speed with less trouble than the other two methods, but unless elaborate means are taken to filter out the gear flutter, a considerable amount of turntable rumble may be introduced.

5. CUTTING HEAD - A great deal of information is usually given about the frequency response of a cutting head, but very seldom is anything said about what happens to the frequency response at different levels or as to what the straight line volume range of the cutting head is at different frequencies. In other words, how linear is the cutting head at the levels encountered in actual recording and what is the linear volume range. A cutting head whose frequency response is linear from 50 to 5000 C.F.S. over a volume range of 40 DB. at usable recording levels will make higher fidelity recordings than a cutting head with a frequency response from 40 to 100000 C.F.S. that is not linear.

It is possible to lower the surface noise and turntable rumble so that the maximum level on the record is 50 DB. higher than the noise level at 96 lines per inch. A cutting head that is quite sensitive is most desirable, otherwise a linear power amplifier to drive it becomes quite a problem. If a cutting head requires a level of minus 6 DB. (0 level, 6 kw.) to record just above surface noise, then it will require a level of plus 44 DB. which is about 150 watts to drive it to maximum recording level. If the cutting head requires a level of minus 16 DB. to record just above noise level, then the power amplifier needs only a level of plus 34 DB. or about 15 watts to drive it. The cutting head should remain a linear device up to levels required to record maximum volume on the disc at 70 lines per inch at a sustained single frequency in order to give maximum linear recordings of average speech and music at 120 lines per inch.

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