with a scissors so it is smaller in diameter than the needle. This will allow the point of the needle to be brought up close to the face of a head. Place on a wood or plastic block.

2. Connect a 1.5-volt dry cell to the head pins thru a 100-ohm resistor, with polarity as specified on the head drawing.
3. With the coil excited, move the head face up to the colored (true magnetic South seeking) point of the compass needle, leaving about 1-mm space. The point will move to the South side of the head gap. Double-gap erase heads or Z-Combo heads will have one polarity for the center pole and the other polarity for the two outside poles.

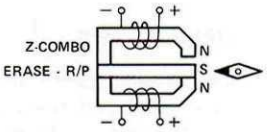

Fig. 10

B. ERASE HEADS

NORTRONICS Erase Heads are of three basic types of core construction:

1. **Metal Core Erase.** Type SEQ, SEH, MEF, B2EH, B1EF, A2H, A2Q, A1HC, etc. for 1/4-inch tape, shown on pages 29, 39, 40, 50, 51, 52, 59, 64. These are low in cost and are available in a variety of case styles and mountings. They have good efficiency up to 60 kHz and can operate at frequencies up to and including 100 kHz, and also with D.C. excitation.
2. **Metal/Ferrite Hybrid Core Erase.** Types PR-B1EF, PR-B2EH, PR-B2EQ and PC-B4-EQ "PRO" series for 1/4-inch tape, shown on pages 28, 32, 60 and 61. STE types for 1/2, 1-inch, and 2-inch tape, shown on pages 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24. These are double-gap erase heads with ferrite center "I" core and laminated Hi-Mu "C" cores, giving the long life and high efficiency of ferrite plus the smooth tape contact surface of polished metal. They are recommended for professional studio recorders which require great depth of erasure and efficient low-power operation at frequencies up to 250 kHz.
3. **Ferrite Core.** Types H805004 and H806036 1-inch full-width ferrite erase. Types W1ER and W2ER single and two-channel erase heads for Cassette recorders. These are extremely efficient erase heads capable of being operated at frequencies as high as 500 kHz for use on high speed duplicators. They are of double-gap all-ferrite construction. See pages 25 and 87.

Application: Metal-Core Erase Heads

Always use a coupling capacitor between the secondary winding of the oscillator transformer and the erase head. If the capacitor is large, about ten times the series-resonance value, it will have little effect upon the erase head voltage, which will then be equal to the transformer voltage. Reducing the capacitance value will begin to increase the erase voltage until a maximum of approximately 1.5 times the transformer voltage is reached at exact resonance. This gives a measure of control of the erase head voltage so it can be set on the recommended nominal value. The head will erase the specified 60 dB at voltages (or currents) 15% above or below the nominal.

The erase voltage will be proportional to the frequency. A head requiring 40 volts at 60 kHz will need 67 volts to produce the same erase current and degree of erasure at 100 kHz. Typical erase circuits are shown in Figure 11.

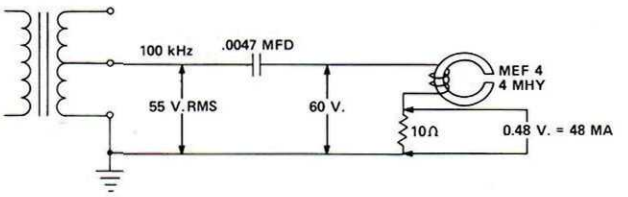

Fig. 11

Application: PR-series Professional erase heads for 1/4-inch tape; STE-series Studio erase heads for 1/2-inch, 1-inch, and 2-inch tape

These superior quality heads are capable of erasing saturated recordings down to the noise level of virgin tape. Dual gap construction and highly efficient core structure require very low power consumption for full erasure.

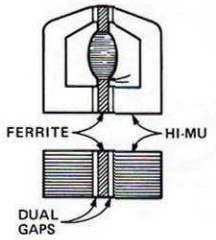

Fig. 12

The hybrid core design features an efficient, long wearing ferrite center I-core and laminated Hi-Mu metal side E-cores for smooth tape contact. The resulting two-material core structure combines the advantages of both ferrite and metal, without the disadvantages.

Excitation. The voltage and current values given in the specification tables are the nominal figures required to produce a minimum erasure of 70 dB from a saturated 400 Hz recording. The heads should be operated within a tolerance range of ± 20% of nominal to insure the 70 dB erasure and prevent saturation of the magnetic core.

Frequency. Because of their high efficiency, these hybrid erase heads may be operated at frequencies up to 250 kHz. Current requirement will remain fixed, but the voltage must be increased proportional to the frequency. Power dissipation will also go up in proportion to frequency.

Power. At 100 kHz the power requirement of the PR-B1EF full-track erase head is approximately 0.7 watts, and the PR-B2EH 2-track and STE Studio erase heads will use about 0.25 watts per channel. To calculate the power, multiply the rms voltage and current (volt-amperes), and then divide by the "Q", which is approximately 7. It is quite important for an energized erase head to be properly "heat-sinked" by securely mounting it to a metal bracket and nest. Also, the movement of tape across the head face serves to carry away the generated heat, reducing temperature rise. These precautions are more important for the multi-track heads operating at higher frequencies.

Saturation. The hybrid erase heads will saturate, causing driving waveform distortion and loading if the head current is increased more than 20% above the nominals given. An ideal way to adjust the drive on a particular head is to increase the voltage until distortion is detected on an oscilloscope, then reduce the drive by 10%.

Coupling. It is recommended that a coupling capacitor be inserted between the erase head and its driver in order to prevent low frequency noise from being coupled to the head and then recorded on the tape, and also to permit a degree of control over the voltage being applied to the head.

The curve (Fig. 13) shows the variation in head voltage, E_h, as a function of the coupling capacitor, C_c. The head voltage