

TALK

SOUND

FROM THE MAKERS OF "SCOTCH" BRAND MAGNETIC TAPE

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SPLICING TECHNIQUES FOR MAGNETIC TAPE

Magnetic tape and magnetic film are generally recognized today as the ultimate in high quality, low distortion recording. One of the most appealing and useful characteristics of magnetic tape is the ease with which it may be cut, edited and re-spliced without impairing the quality of the recorded information on the tape. The fact that tape ends can be joined so easily, however, has led to considerable trouble in operations where poor splicing techniques and/or poor splicing materials were used. It is possible to make splices in magnetic tape which will be as strong as the tape itself, will wear without fraying or loosening, and can be detected insofar as magnetic performance is concerned by only the most sensitive computer-type recorders. This article discusses methods and means of producing such splices.

GENERAL CONSIDERATIONS

Most pressure-sensitive tapes now on the market have adhesives which are unsatisfactory for use in splicing magnetic tape. Splices in the wound roll of tape are subject to considerable pressures and temperature

variations, and the adhesives used in ordinary pressure-sensitive tapes will "creep" or "bleed" around the splice. This is a particularly serious condition, since not only the strength of the splice is impaired but also the adhesive invariably contaminates the magnetic side of the tape, causing adjacent layers to adhere, one to the other, with resultant loss of recorded intelligence in the contaminated area due to poor head contact. The adhesive can also transfer to the heads and guides of a recorder, and thus ruin a considerable amount of tape.

To prevent trouble from the adhesive of the tape, a tape specially formulated for splicing magnetic tape is available, guaranteeing trouble-free performance if properly used.¹

Translucent white in color, this acetate-backed, pressure-sensitive tape for splicing is universally used with quarter-inch magnetic tape. Its mil and a half thickness provides thin yet strong splices. A new pressure-sensitive adhesive has these thermosetting characteristics: The bond with the magnetic tape increases under the effects of time and temper-

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atures encountered in use. Also, of course, the adhesive will not ooze or bleed around the edges of the splice. Eliminated is any tendency to gum up recording heads or cause the adjacent layers of magnetic film to stick together on the reel. This standard splicing tape is available in numerous sizes and widths for editing and splicing regular program recordings.

In the quarter-inch magnetic tape field the diagonal butt splice is by now a tradition. Such splices, properly made, wear without fraying or loosening. To make a perfect splice the ends of the tape to be joined should be held in some rigid fashion to prevent displacement while the splice is being made. There are three ways of doing this:

- A. By holding the tape securely between fingers and cutting with a pair of scissors.
- B. By laying on a flat surface (example, soft wood block or sheet of rubber) and cutting with a razor blade. This technique can be further improved by placing a straight edge along one side to position both tapes.
- C. By using a commercially available splicing block.

The two ends of the magnetic tape to be spliced should be overlapped sufficiently to enable easy cutting and true alignment of both tape ends, providing the recorded information will allow this much tape to be removed. Naturally, no cutting will be done at all if a break in the tape is being repaired. Line up the ends of the tape so both sections are butted and are in alignment with each other. The splicing tape must always be placed, of course, on the backing (or "shiny") side of the magnetic tape.

For quarter-inch wide magnetic tape, the angle of the cut ends is not critical but one must use a diagonal cut

to avoid a "pop" at the splice point. All angles are measured from the edge of the tape. A 90° cut is to be avoided always. As the angle of the cut edge becomes smaller, the strength, flexibility and magnetic invisibility of the splice becomes greater. A 45° angle is satisfactory although a 30° splice is approximately as strong and flexible.

A piece of standard splicing tape is centered over the butted ends parallel to the splice. The width of the splicing tape used should never exceed $3/4$ " for general work, since wider tapes impair flexibility. After firmly pressing the splicing tape into position, rub firmly with the fingernail or other semi-hard object to press out all air bubbles. The excess splicing tape is trimmed by cutting into the magnetic tape slightly. Thus danger of exposed adhesive from the splicing tape is eliminated.

SPLICING WIDE-WIDTH AND HEAVY BACKING MAGNETIC TAPE

In splicing 35mm, 17.5mm and 16mm magnetic film the wide width and heavy backing introduce new and more critical splicing problems. At the express desire of the motion picture industry a new splicing tape was specially developed for motion picture application.

Somewhat different, modified splicing techniques are required when working with magnetic film. In motion picture application maximum strength and flexibility are essential. In the magnetic film field sprocket holes plus the increased width and thickness have in the past made it more difficult to obtain a sufficiently strong yet thin and flexible splice. To meet the need for a strong, yet thin, splicing material, a special pressure-sensitive splicing tape is available. While identical in adhesive characteristics to the standard splicing tape, the tape is slit to 35mm, 17.5mm and 16mm widths.² Also translucent white, it features

standard sprocket holes -- double perforated for use with 35mm and 16mm magnetic film, and single perforated for use with 17.5mm magnetic film. It is made with a tough "Mylar" (DuPont trademark) backing, providing nearly twice the tensile strength and six times the tear strength of the acetate-backed tape previously used for splicing, yet is no thicker.

Because of the stiffer backing employed in the manufacture of magnetic film and increased rigidity, the edges of the splice have a tendency not to conform as readily when passing through the head, tending to lift at the edges of the splice. Therefore, a low cutting angle is desirable from the standpoint of strength and head conformity. However, it can be clearly seen that if the angle is too low the splice will tend to lift while rounding small diameter rollers.

Although the "lazy S" or "ogee" splice allows excellent flexibility and strength, preventing buckling of the magnetic film as it passes over the rollers or guides, the difficulty of making this type splice has limited its use.

As a result, the diagonal butt splice has been most widely used with magnetic film as well as quarter-inch magnetic tape.

The excellence of a splice in magnetic tape can best be judged by the degree of disturbance which it causes in the magnetic record upon playback. The use of proper splicing methods and materials as discussed in this bulletin produce splices which are essentially acoustically invisible.

- 1- "SCOTCH" Brand #41 Splicing Tape manufactured by Minnesota Mining and Manufacturing Co., St. Paul 6, Minnesota. Available in standard rolls 7/32", 1/2", 3/4" x 22 yds., or by 150 inches in length.
- 2- "SCOTCH" Brand #157 Splicing Tape. In ordering, specify 35mm, 17.5mm or 16mm widths. Rolls are 22 yds. long.