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# NASA TECH BRIEF

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## Dropouts in Magnetic Tape Recording and Reproduction

A monograph on an examination of dropouts that occur in magnetic recording and reproduction processes discusses the causes of dropouts and means of minimizing them.

Dropouts occur when the tape lifts away from the surface of the head because of tape nodules or debris buildup, or when the tape drops away because of tape deformation or holes in the coating.

Dropouts can be caused by a number of factors. Except in those rare cases where tape handling equipment degrades the tape, responsibility for dropouts lies with the tape itself. This is particularly true for the oxide particles; but the backing, especially polyester, is also suspect since it is tacky and susceptible to static charge buildup. Finally, in repeated operation, an accumulation of contamination in the tape transport, or of debris on the head or guiding surfaces, often transfers to the tape and causes dropouts.

Although the traditional dropout formulas are excellent for their intended purpose, they are not suited for small dropouts having an area of influence less than a track width. The formula that should be used is developed and stated in the monograph, along with comparisons between its results and those of the traditional techniques. These results show that dropout characteristics, at least for small dropouts, are not as severe as originally thought.

Dropouts of large proportion, i.e., those which extend across a track width or more, can be easily spotted using several tape inspection machines. In most instances, these machines also clean the tape. Gross faults are usually due to improper reeling or damage within the tape transport system.

Dropouts can be minimized by judicious selection

and maintenance of tape and tape transports. If the tape becomes contaminated, but the general tape quality has not been destroyed, it can be restored to the original characteristics by proper cleaning. (Certification to ensure the validity of the cleaning process is recommended.)

The precautions to be observed in minimizing tape dropouts are self-explanatory. In general, they involve extreme care in cleanliness and handling, commensurate with the criticality of the requirements of the individual user. A conscientious, well-trained operator substantially ensures maximum performance from a high quality tape and transport system. Where the incidence of dropouts is inordinately high, it is advisable to examine all factors that might contribute to the problem, including the tape. This applies to the total environment of the tape before and after recording.

### Note:

Requests for further information may be directed to:

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