

other instances the double mark is simply stated to be a single mark.

According to Bell, the double mark is indeed what it appears to be, and the problem becomes one of explaining why the panel says it is not. The answer is that if the record head was twice turned on, then in between it must have been turned off, and the pair of marks should be separated by a record head off mark. Moreover, the record head off mark must be accompanied by an erase head off mark 28.6 millimeters down the tape. No such marks are there. This proves, says Bell, that the so-called record head on pulses could not have been caused by manipulation of the keyboard but were probably made by strong transient pulses, perhaps originating in the faulty power supply.

The panel has a second string to its bow on the identification of the record

head on pulse. It says the pulse can be recognized because it "has a duration of 100 milliseconds." Here, according to Bell, the panel is simply confused. As can be seen from Fig. 2, the so-called record head on mark is about 0.2 millimeter thick, and hence at the tape speed of 15/16 inch per second the pulse that made the mark could have had a maximum duration of about 8 milliseconds. The panel's confusion arises because it has tried to measure the duration of the pulse from the disturbance in the wave form, but the wave form is primarily a product not of the duration of the pulse but of its amplitude. Moreover, because magnetic tape is saturable, any kind of pulse above a minimum amplitude will produce a wave form of similar duration.

● *Phase change measurements.* The buzz on the 18½-minute section is

composed of the 60-cycle-per-second frequency of alternating current and of the harmonics thereof. A good way of telling whether the tape was stopped, as the panel's theory supposes, is to see if there are discontinuities in the phase of the buzz. The panel has done this with the aid of a phasemeter and produced the result shown in Fig. 3. The downward shift in the middle of the figure "indicates a discontinuity in phase and therefore a stopping of the tape," the panel says. The sloping line that follows "indicates that the tape has changed speed. In this case the speed change is about 0.3 percent." Speed changes of this sort "occur frequently at the start of test recordings that we made on [Rose Mary Woods's] Uher."

Bell's rejoinder is that the observed discontinuity in phase does not necessarily imply that the machine stopped, only that its speed changed and, as the panel observes, changed by as little as 0.3 percent. Such a variation is probably well within the Uher's motor speed regulation. Moreover the Uher's motor is connected in a way that makes the motor speed particularly vulnerable to fluctuations in the current reaching the transformer. As it happens, the failed rectifier which the panel had to replace was located in a power supply whose variations would have affected the transformer.

Finally, Bell observes that there are several marks on the tape for which the panel offers no explanation. One feature in particular on which the panel offers no comment is the indication that at one point the tape has been played on a 4-track recorder. Both the Uher 5000 and the Sony 800B used to record the tapes in the first place are 2-track recorders.

Another mark the panel cannot explain is a click that occurs 46 seconds into the buzz section when there is a sharp drop in the loudness of the buzz. "We do not completely understand this event, but we conclude that it does not alter our interpretation of the other events on the tape," the panel stated in an early draft of its report. In the final report this qualification has been omitted, but no explanation is provided in its place. Elsewhere in the final report the panel states that "only one explanation, the one given here, accounts for the data in their entirety."

Finally, the panel summarily dismisses the hypothesis proposed by Bell in January on the grounds that "it was based, erroneously, on the assumption

Briefing

Court Limits Class Actions

The Supreme Court on 28 May handed down a decision that puts significant restrictions on the scope of class action suits in which monetary damages are sought. One attorney called it a "devastating" blow to the effectiveness of such suits, but lawyers say it will not have much effect on environmental or civil rights class action cases, the vast majority of which seek injunctive rather than financial relief.

The decision is the culmination of an 8-year court battle initiated by one Morton Eisen, who claimed in behalf of some 6 million fellow buyers of odd-lot stocks (lots less than 100) that two brokerage firms were monopolizing the odd-lot market and charging excessive brokerage fees. The court maintained that it was the plaintiff's responsibility to individually notify all identifiable fellow victims, and to pay for the notification—a procedure which, at present postal rates, would have cost him about \$315,000. Since a major function of class action suits is to enable large numbers of people to recover damages in cases where individual stakes are low (Eisen would have recovered only \$70), the notification requirement is somewhat self-defeating. Hitherto, courts around the country have been deliber-

ately flexible both in notification requirements and in apportionment of court costs so that one of the perceived purposes of class action suits—giving the little man his day in court—could be served. The purpose of the notification requirement is to allow some members of the class to opt out of the suit, which some might do if they were planning separate actions that would be invalidated if they had to abide by the result of the class action. However, the decision could prevent large numbers of people from collecting damages in antitrust or product liability suits where the plaintiff is forced to narrow down the definition of the afflicted class to the point where notification is financially feasible. One Washington lawyer points out that the decision may relieve large business concerns from excessive worry about being held accountable for faulty products, overpricing, and usurious or monopolistic practices that may have little effect on individuals but significant impact on their customers as a group.

While environmental class action suits do not now appear likely to suffer, a Sierra Club official says they may in the future if large numbers of people want to seek reparations for environmental damages wrought by such developments as airports and power plants that their injunctive suits had failed to halt.—C.H.