NOTES ON TROUBLE

1. If machine has been subjected to unusual cold, the motor must be warmed up for several minutes before it will pull into synchronization.

2. Treated tape should be used on all dual speed machines to prevent fouling of the heads. If for any reason, the tape should deposit dirt or magnetic material on the face of the recording or reproducing heads, the high frequencies will be lost and quality of recording and reproduction will be affected. Treated tape has a coating of lubricant to prevent this as much as possible.

3. Tape must be in close contact with the gap in the heads in order to realize full capabilities. High frequencies fall off very rapidly with separations amounting to as little as half a mil between tape and gap.

4. The reel idler is an impedance flywheel device which performs the same function for the tape that the kinetic scanner or rotary stabilizer does for film in standard sound heads. It is equipped with ball bearings and lubricated at the factory. Any unevenness or foreign matter in these bearings will result in flutter or wows. If lubrication should be indicated, make sure that oil and oil can are clean.

5. A small signal-to-noise ratio indicates that either or both of the record or playback heads have become magnetized. The character of the noise is "crackling" and "frying". In some instances it has the sound of popping corn. Demagnetization of the heads is outlined in the manual. If the capstan becomes magnetized the character of the noise produced is a sort of "chug-chug", at a period of twice the speed of rotation of the capstan. Magnetization of the capstan occurs when a metal object, such as a screw driver or other tool having a residual magnetic charge, comes in contact with it. It is a good rule to keep from laying any hand tools on the top of the machine. Demagnetization of the capstan is accomplished by winding a coil of wire about 400 turns large enough to slip over the capstan. Excite this with 60 cycle A.C. from a 6 volt transformer and slowly remove the coil from the capstan while the current is flowing.

6. Playback and recorder heads can be magnetized in the same manner but because they are normally shielded, are not apt to be charged accidentally in this way. If an attempt is made to clean them with a magnetic object magnetization may occur. They will be magnetized also by changing or replacing tubes with amplifier turned on or in making any adjustment which might cause a surge of D.C. through the coils of the heads. It is a good rule to turn off the power or unplug the heads when replacing tubes or making amplifier checks during which the heads are not required.

7. If the tape is cut or patched using scissors that have a magnetic charge, that patch will be a noisy one.

8. The gradual change in capstan speed due to the wear of the rubber tire on the capstan flywheel (300 Series) can be compensated for by increasing the tension of the motor pressure springs. This should be unnecessary until the machine has been in use over a long period of time.

9. Wows or flutter may be caused by worn rubber tire on the capstan idler or a bad bearing. If this occurs, a new idler roller complete should be installed. If tension of the idler against the capstan is insufficient, slippage will occur which will be evident as wow. This tension should be such that if the tape is held stationary by hand while the capstan is turning and the idler engaged, the pull will be sufficient to deform the tape.

HUM TROUBLES

10. Normal hum level throughout the system should be at least -60 db when measured at the output of the playback amplifier.

11. Hums can, of course, be caused by the usual source in amplifiers such as bad filter condenser and cathode to heater leakage.

12. In addition, hum in these machines can be picked up inductively through the playback head and record head if the shield can covers do not fit tightly when the gate is closed. During manufacture these covers are lapped to fit very closely and are held in position by means of a flat spring. If for any reason this spring becomes bent or misadjusted, the shield might not be complete and hum pickup result. If this occurs the covers and springs can be pulled into position by hand until complete closure is achieved.

13. The outside shield of the coaxial cable to the playback head must be continuous into the housing to prevent hum pickup.

14. In several instances a hum was found to be due to a broken ground connection to the shock mounted sockets of the first two stages in the playback amplifier. Insufficient length on this wire allowed vibration to break it at the pin. This condition has been remedied on current models but there may be some in use which will develop trouble.

NOTES ON TROUBLE

With regard to the uneven re-winding of the tape, the following covers the possible causes of this difficulty. The re-wind and take-up turntables must be in a plane exactly parallel to the top-plate. These assemblies are mounted to the top-plate with rubber washers which allows slight adjustment for leveling. The accuracy of this adjustment can be checked by placing a straight edge on the turntables and measuring the distance to the reel guard from each end at different points of rotation. This measurement should be the same at any point for correct alignment. The height of all tape guides above the top-plate should also be exactly the same for proper re-winding.

If any misalignment exists in the tape path, one edge of each tape used on this machine will be stretched a minute amount. Because of this stretch, an even re-wind will not be obtained when these tapes are first used on this machine and we would, therefore, suggest a new roll of tape be used for checking the re-wind after alignment of the tape path has been completed. Those tapes which have been slightly stretched will correct themselves with use and re-wind properly.

Any increase in hold-back during re-wind improved the evenness of the re-wind. It is possible to increase the voltage to the take-up motor, which will increase the hold-back tension while re-winding . A slight decrease in the resistance of R-803 in the top-plate schematic diagram will provide this increased voltage. It should be noted, however, that too tight a re-wind will stretch the tape slightly and, therefore, care must be used in making this adjustment.