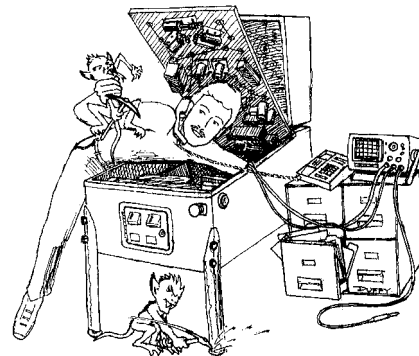


Service Bulletin N° 93



Joe Blackwell Eric Winston Ted Kilpin Jay Alfer
Technical Support Manager Technical Support Engineer Technical Support Engineer Tech. Doc. Administrator

TO: Parts & Service Managers

DATE: January 27, 1997

SUBJ: F.Y.I We have identified a problem in a small quantity of I/O Power Driver Boards (less than 50) that may have been installed into Space Jam Games. (Sorry, but we are unable to supply a serial number breakdown for verification.)

Explanation: The heat sink for the LM338K +5 Volt Regulator (TO-3 Transistor Package) was incorrectly manufactured (the through-holes in the *Heat Sink* for the two leads of the LM338K were not located correctly and may short the leads against the *Heat Sink* or the *Heat Sink to the Solder Pads* (See Fig. 1).

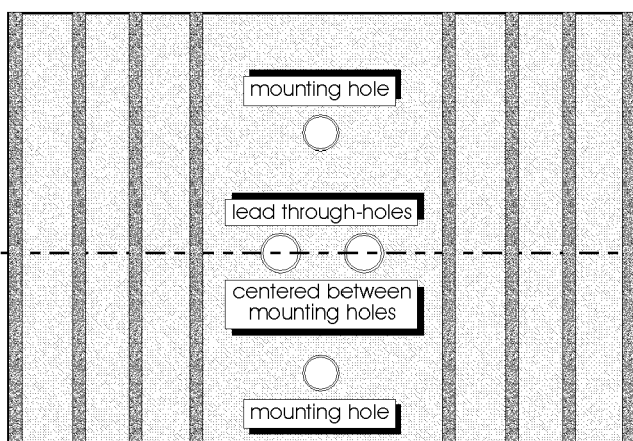
When this occurs, the unregulated input DC voltage (approx. 8 ~ 9v DC) can be directly shorted to the *Heat Sink* and thus to the case of the regulator. Since the regulator case is also the regulated voltage output connection, this means that 8 or 9v DC can appear on the +5 Volt Power Bus of the game. This will cause an assortment of strange symptoms ranging from random game malfunction (chattering flippers, bad Dot Display, bad sound) to failure of other game PCBs due to overvoltage conditions. **The best way to verify this condition in your game is to simply meter the +5 Volt supply. If you see any reading higher than 5.5v DC, the heat sink is the prime suspect.**

The **next step in verification** is a little more complicated: the regulator must be de-soldered from the I/O Board and the through-hole location for the transistor leads on the *Heat Sink* should be inspected. If the two holes are **CENTERED** between the two mounting holes (on the ends) instead of *offset* (closer to one of the mounting holes, matching the leads on the TO-3 Case), the *Heat Sink* is **BAD** (See Fig. 1).

To remedy this, you should call your Distributor or 1-800-KICKERS (542-5377) to arrange an advance replacement board(s). Alternately, for that *Friday-Night Repair on the Street*, a 3/16" or larger drill-bit can be used to *ream-out* the through-holes so as to remove the potential short condition (enlarging the through-holes in the direction of one of the mounting holes to line up better with the leads of the TO-3 Regulator.) (See Fig. 2.)

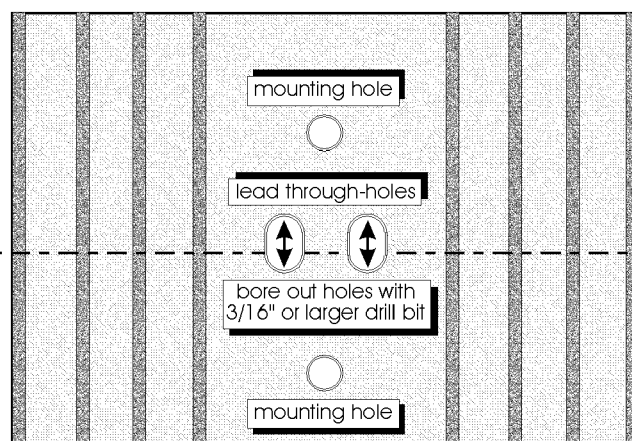
YOU MUST REMOVE THE HEAT SINK FROM THE BOARD BEFORE ATTEMPTING THIS PROCEDURE

Fig. 1 Incorrect



Heat Sink

Fig. 2 Fix to Correct



Heat Sink