

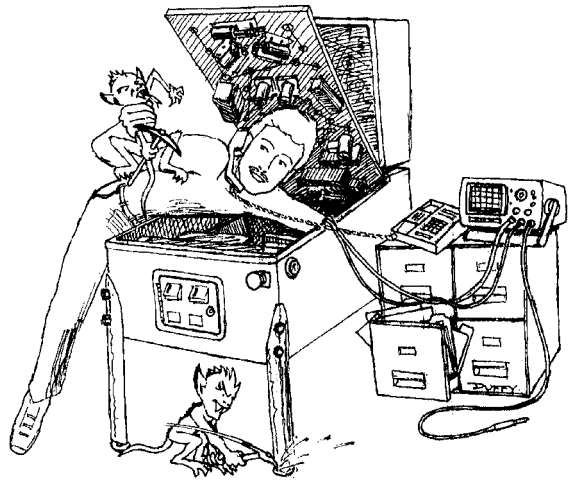
Service Bulletin N° 81



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TO: Parts & Service Managers

DATE: January 9, 1996

SUBJ: Apollo 13 System Update 

APOLLO 13 uses our new White Star Board System. After extensive evaluation we have made two modifications to the existing system which we feel will help to better protect the high current drive circuits. *We are stating that these updates are mandatory because circuit protection this easy to provide should be added.*

T H E S E U P D A T E S A R E M A N D A T O R Y

UPDATE #1 - We have added a varistor (□□47ZR14D Manufacture: Stetron), Sega Pinball Part # 121-5024-00, across the normally open contacts on the Moon Motor Relay Board. The varistor eliminates voltage spikes that could be generated by the AC Motor. These voltage spikes have the potential to damage the MOSFET (STP2□N1□L) Drivers used in our high current drive circuits.

r Refer to page 2 for the installation procedure.

Note: Varistor update kits are being sent out to all Sega Pinball Distributors. Recently manufactured games may have this update already.

UPDATE #2 - We have found that the present 5 Amp Slo-Blo Fuse @ Location F21, I/O Power Driver Board, may in some cases not protect the 50v DC circuit sufficiently. This in turn could cause damage to the I/O Power Driver Board if a short condition occurred.

r Change F21 on the I/O Power Driver Board to a 3 amp Slo-Blo Fuse.

Note: Your game may already have a 3 amp Slo-Blo @ F21, I/O Power Driver Board. It is always best to double-check.

If you have any questions or concerns, please feel free to call us at 1-800-542-5377 or 708-345-7700.

Modification of Relay Board to Suppress Back-EMF Voltage Spikes

To suppress voltage spikes that may be generated by the moon motor, you need a Sega Pinball Part # 121-5024-00, 47 volt varistor and a jumper wire (Note: The varistor mentioned is an equivalent to Z1 on the 520-5047-00/01/02 or 03 power supply).

STEP 1 Locate Relay Board 520-5010-00 responsible for switching power to the moon motor. Identify by the **VIO/ORG** wire (See Fig. 1 & 2) in the playfield harness which goes to Pin 2 of the Relay Board Connector (Note: There is a Blue Wire coming from the Relay Board to the Relay Board Connector Pin 2). **ATTENTION: IT IS NOT NECESSARY TO MODIFY THE ROCKET RELAY BOARD (VIO/YEL WIRE CONNECTION).**

STEP 2 Insert varistor in location R1 on this board, and the jumper in location C1 (See Fig. 2 & 3) (Note: Use one of the leads trimmed from Z1 (if a new varistor) for the jumper at C1).

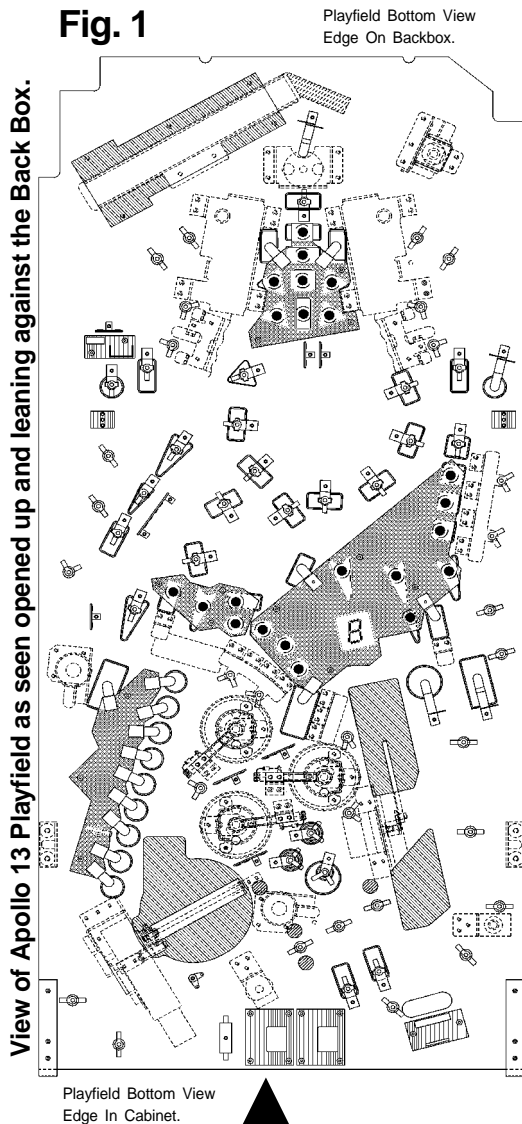
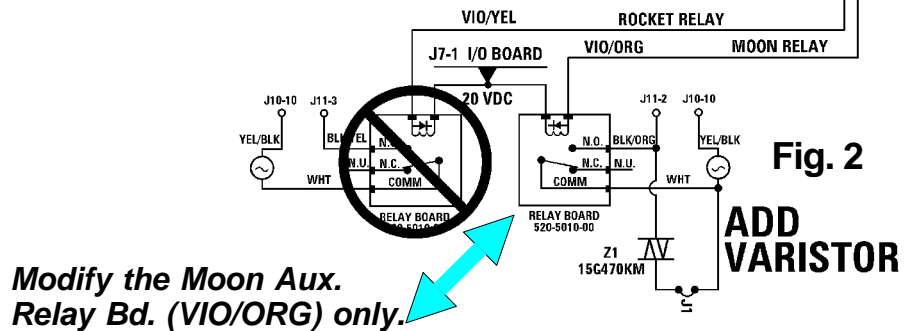
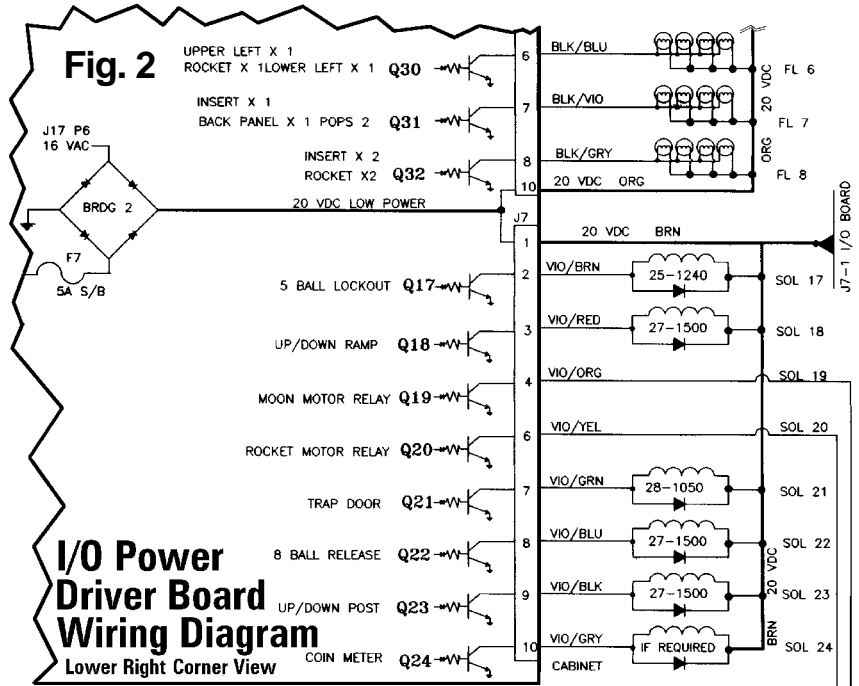


Fig. 1
Identify the Aux. Relay Board (Moon) with the VIO/ORG wire connection.



Modify the Moon Aux. Relay Bd. (VIO/ORG) only.

