Service Bulletin Nº 92





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: December 5, 1996

SUBJ: FYI: MOSFETs in the White Star Board System®

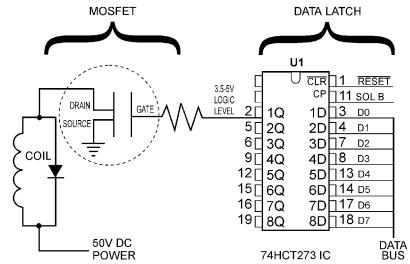
MOSFET Devices have been technology proven and are used widely in the field of electronics, automotive, computer, industrial and amusement. MOS Technology stands firmly alongside Bipolar Technology with the increased innovations in Silicon Technology. Also, a great deal of progress has been made in Power MOSFET Technology in recent years.

These **MOSFET**s Devices (manufactured by SGS Thomson) are used on our Sega Pinball White Star Board System[®], specifically as a *Solenoid Driver / Lamp Return* on the I/O Power Driver Board.

Five (5) main advantages of a **MOSFET** are:

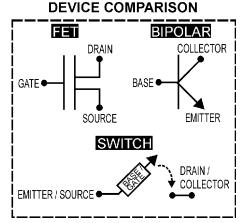
- 1-high current
- · 2-high speed switching
- 3-reverse bias safety operation
- 4-very short delay time at turn-off
- 5-easy to drive:
 - A- voltage driven input to the gate
 - B- low drive power requirements
 - C- less components required in the drive circuit

The MOSFET Device "STP20N10L" is used as a High Power 50v DC Coil Driver (Q1 to Q16) & the MOSFET Device "STP19N06L" is used as a Lamp Return Driver (Q33 to Q42). These devices work very simple; meaning there are only three (3) leads to MOSFET Device: Gate, Drain and Source.



Operation of the MOSFET starts when the controlling element called a GATE receives a 3.5-5V LOGIC LEVEL (Signal) directly from the DATA LATCH. One example of a DATA LATCH is the 74HCT273 IC as used on the White Star I/O Power Driver Board. The MOSFET is then turned on thus completing the closure between the SOURCE and the DRAIN. The SOURCE (being Ground in this case) and the DRAIN (going to the device) completes the circuit, known as Drain Current then turns on a device such as a lamp or coil.

When ordering the **MOSFET** Devices from a local supply source, the correct Part N $^{\circ}$ must read **STP20N10L** or **STP19N06L**. Some confusion resulted when just "P20N10L" or "P19N06L" was requested (the mfg. SGS Thompson will only recognize the Part N $^{\circ}$ starting with "ST"). The Sega Pinball Part N $^{\circ}$ is **110-0106-00** (for STP20N10L) and **110-0088-00** (for STP19N06L).



1990 Janice Avenue • Melrose Park, IL 60160 • Tel 708-345-7700 or Toll-Free (USA/Canada) 1-800-542-5377 • Fax 708-345-7889