FROM: Field Service Dept., Data East Pinball, Inc.

TO: Service Managers

DATE: April 20, 1988

RE: Laser War - Improvements (Spinning Targets, Pop Bumpers, Game Program,
          Flippers & CPU Board)

Our Customer Service Department has received some calls concerning several items on Laser War Pinball, that we felt needed improvement. These updates have been incorporated into production, but you may encounter a problem that requires replacement parts to update your game. The number of games that require replacement parts should be small, so we have shipped distributors an initial quantity to warranty replace as needed.

The areas of concern are as follows:

SPINNING TARGETS

1.   Early spinners used a light guage pivot wire which may break. Spinners presently being used have been updated to a heavier gauge.

2.   The right ball rail in the yellow spinner lane may eventually be bent by ball hits causing it to apply pressure to the spinner actuator rod. A finishing nail has been added behind the rail to prevent movement (Refer to Fig. 1).

POP BUMPERS

1.   Early games used nuts with lock washers to secure pop bumper rings and coil stops. Due to heavy vibration, these nuts may loosen. Although pop bumpers are the only area of concern, we have updated production to install #6-32 ny-lock nuts (Part Number 240-5005-00) on all coil stops and pop bumper rings.

2.   Some Laser War's are experiencing problems with pop bumpers switches that require premature cleaning and adjustment. We have discovered that the self-cleaning wipe action of the earlier switches are not sufficient enough to eliminate premature service. Replacement switches (Part Number 180-5036-00) for games that encounter this problem will be shipped to distributors as soon as possible.

GAME PROGRAM

1.   It was noticed that a slight intermittent flicker was present in the player displays of Laser War. The program was updated and replacements should be given to operators that find the flicker unsatisfactory.

Game Program Continued

2. We also improved another area of the program by displaying replay information during *Attract Mode.*

3. To check which revision program your game contains, enter the audit mode and the program ID number will be displayed. The lastest version is AO8-3.

NOTE !!!

When replacing the CPU program, the CMOS RAM must be reset to allow factory settings of the new program to function properly. Use Adjustment Number 47 (Install Factory Settings) to clear the memory after installing new the program.

FLIPPERS

1. Some Laser War's have had a flipper coil fail due to the possibility of one of two causes.

    A. The first potential problem is the possibility of the End-of-Stroke Switch mounting screws loosening, allowing the switch to misalign with the actuating pin on the plunger assembly. Star washers (Part Number 246-5000-00) have been added to these screws to avoid loosening.

    B. The second possibility is the End-of-Stroke Switch may require premature adjustment to ensure proper opening. A new design of the switch has been approved and we will ship replacement switches (Part Number 180-5018-00) to your distributor as soon as possible.

CPU BOARDS

After receiving some calls on various problems that appeared to be CPU Board related, it was noticed that the memory interlock circuit had improper filtering at the connecotr input from the memory interlock switch on the coin door. We are adding the proper filter network and recommend you make this change to your CPU Boards (Refer to Fig. 2).

The intermittment symptoms you may encounter due to the lack of this network are as follows:

1. Loosing Audits.

2. CPU shut down or lock-up.

3. Ball trough eject coil lock on.

If you experience the ball trough coil locking on, you should add a 2 amp Slo-Blo fuse in series with the power wires for this coil.

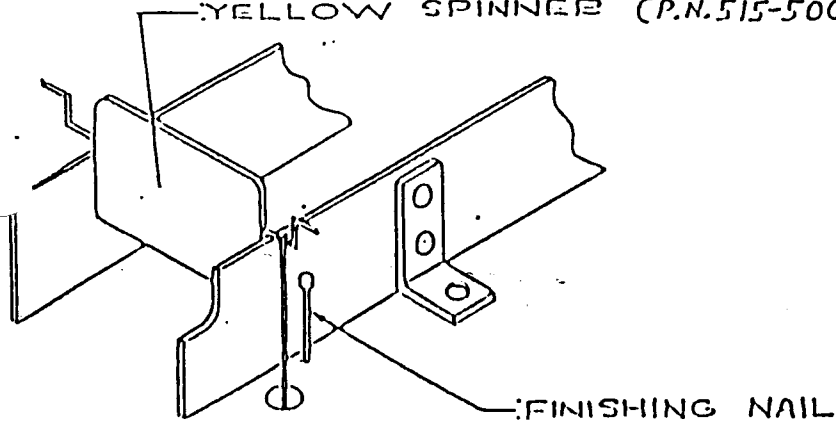Figures 1, 2, 3 are on Page 3.

YELLOW SPINNER (P.N.515-5004-10)

FINISHING NAIL

FIG. 1

BACK SIDE OF CPU BOARD

1. Cut trace (shown as X) at point A close to Pin 1 of CN 14. .
2. Scrape solder mask from same trace at point B.
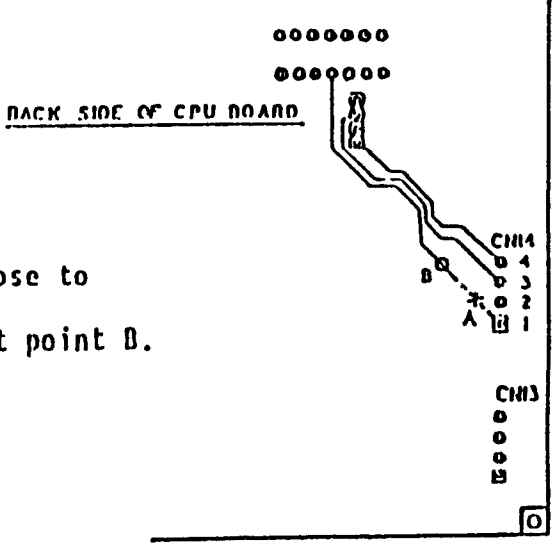3. Refer to Fig. 3

CN14

CN13

FIG. 2

PIN 11
OF 1F
74LS02

CN14

CN13

4. Tack solder one end of R1 (470ohm ¼watt) to Pin 1 of CN 14.
5. Tack solder one end of C1 (.1MFD 16V or higher) to Pin 2 of CN 14.
6. Cover R1 & C1 with small lengths of insulating tubing and tack solder each opened end to point B of scraped trace or jumper to Pin 11 of chip 1F.
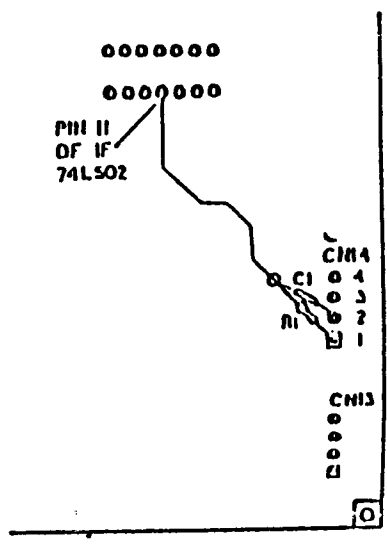
FIG. 3