

STAR TREK

OPERATING and SERVICE GUIDE

USA - Coin in / Ticket out Feature.

Produced by ;

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2. GENERAL INFORMATION

This Manual is intended as a guide to servicing, fault finding and repairs on your Star Trek pusher. All details and specifications shown in this manual were correct at the time of print. The right to modify equipment, change specifications and instructions at any time, without notice is reserved as part of Harry Levy Amusement Contractor Ltd. policy of continuous development and improvement. Only qualified, professional personnel should gain entry to the machine, and no liability is accepted by Harry Levy Amusement Contractor Ltd. or their staff for any damage or injury arising from the use of this service manual.

3. COMMISIONING.

3.1 Maintenance

To keep your machine in optimum condition for maximum profit, maintain all visible internal and external surfaces in a clean 'as new' condition.

- 1 Laminated cabinet body - Clean with an all purpose cleaner.
- 2 Glass and chrome parts - Clean with a quality window cleaning solution.

Always use cleaning products according to the manufacturers own instructions.

3.2 When you receive your machine.

Remove any transit packing materials from the machine then site your pusher on a smooth level floor. Please handle your machine with care using appropriate lifting equipment, do not drop or subject it to shocks, or a damp environment. Connect to the mains using the lead supplied.

Important - This machine must be grounded (earthed).

Machine	Star Trek USA				
Voltage:	115	VAC	Freq:	60	Hz
Power:	1000	W	Amps:	9	A
Overall weight					
Kg	lbs				
327	721				

3.3 Switch On and Self Test.

Switch the machine ON. The Dichroic lamps will light and the pusher boxes will start moving. The feature lamps will flash their sequence. The count hoppers will run for ~10 seconds, and thereafter every 3 minutes to clear any stray coins. At intervals the attract sounds will operate. Adjust the volume level to suit the surroundings. The volume control is situated on the sound card on the left hand wall inside section 2, to the right of section 1, where the power lead enters.

3.4 Tilt.

There are tilt sensors inside each paycup door, and a single pendulum tilt device in section 1. Banging the machine will sound the alarm. All count hoppers will run. Any coins that fall from the playfields into the count hoppers will be discharged but no tickets issued. This state will continue for approximately 10 seconds, or until all hoppers are empty. The machine then reverts to its normal attract mode.

3.5 Preparing the Machine.

After checking the machine functions correctly each playfield will require approximately 600 coins to float or prime it ready for play. The first 90% of the coins may be hand placed in small batches onto the moving pusher box, allowing the machine to spread them onto the main playfield. The final 10% of coins (and winnings) should be played into the machine through the coin entries.

3.6 Normal Play.

When a player inserts a coin it passes a sensor that switches that section on, enabling the playfield winnings system to make legitimate awards. The section remains enabled for approximately 30 seconds. A coin counter records each coin inserted.

If tilted or bumped whilst being played the tilt system takes over the entire machine. Coins falling from the playfield are ignored and no tickets will be issued.

3.7 Feature Game.

When a player inserts a coin it runs down the coin chute through a flag opto. Attached to the top of the chute is a PCB with 'running' LED's. If the coin triggers the opto when the large red LED is lit the player enters the feature-stop game on the central support pillar. The Stop button is on the top glass on the right.

The aim of the game is to stop the light on the character with the highest value. Once stopped the ticket mech will dispense the quantity of tickets displayed against that particular character.

4. SPECIAL FEATURES

4.1 Swipe option

The machine has the option of being fitted with a swipe system to each section.

The swipe system allows players to obtain coins / tokens for the machine by using a swipe card. Once 'swiped', coins / tokens for play will be dispensed to the player via the paycup.

4.2 Motor controller board.

The pusher box motor is controlled and driven by a control board. This is located in the power supply box inside section 5. If the motor should jam for any reason, the motor will stop and the alarm will sound. Clear the jam and push the reset button to restart. The reset button is recessed in the floor. There is a bank of dip-switches to vary the sensitivity of the system and an override facility (See switch settings).

4.3 Counters.

There are three counters per section to count coins-in, tickets-out & swipe coins. The counters are located inside the lower cabinet doors.

5. ACCESS.

5.1 General

With the exception of external cleaning always **disconnect** the machine from the mains supply by removing its plug from the supply socket.

5.2 Playfield.

Release the locks on the glass window (301 Key) and lift it carefully out of the machine. Place the glass somewhere safe for temporary storage.

5.3 Lower Cabinet.

Each player section has an access door below the playfield which can be fully removed by releasing the locks at the top of the door.

This gives access to the following:-

- Ticket Dispenser
- Count & Payout (swipe) hoppers
- Paycup
- Pusher motor and drive system
- Power supply units including reset fuses.
- Sound Board
- Alarm sounder
- Pendulum tilt
- Speakers

5.4 Cash box compartments.

Each player section has an access door below the pay-cup which can be fully removed by releasing the lock at the top, and lifting the door out. This gives access to a lockable cashbox.

6. ELECTRICAL SYSTEMS.

The mains inlet plug is recessed in the base of the machine. There is also a top feed facility on the top of the machine. Both are fitted with a 10 Amp filter.

The mains switch is located in section 1, directly above the mains inlet plug.

The mains wiring is all double insulated in the cabinet base. The motor is shrouded in an earthed metal box.

6.1 Fuses

The mains switch housing incorporates a 16 Amp reset type fuse.

The power supply boxes also incorporate reset type fuses of various values to protect the various low voltage wiring and systems from excess current. See wiring diagrams for details.

The mains fuse for the drive motor is fitted on the motor drive board in the power supply box inside section 5:

Mains Motor fuse - 2 Amp(T) (Time delay)

6.2 Switch Settings

Logic Board Program

SW1	Pole	1	2	mercy tickets
		off	off	0
		on	off	1
		off	on	2
		on	on	3

SW1	Poles	5	6	7	8	Coin over edge : ticket ratio
		off	off	off	off	1
		on	off	off	off	2
		off	on	off	off	3
		on	on	off	off	4
		off	off	on	off	5
		on	off	on	off	6
		off	on	on	off	7
		on	on	on	off	8
		off	off	off	on	9
		on	off	off	on	10
		off	on	off	on	11
		on	on	off	on	12
		off	off	on	on	13
		on	off	on	on	14
		off	on	on	on	15
		on	on	on	on	16

SW2	Pole	4	Reset
		off	normal operation
		on	clear ticket payout registers. Power-up game with dip-switch on, then turn switch off. A sound tone should indicate reset.

Swipe Changer Board

SW1

Poles	1	2	3	4	5	6	Coins-per-Swipe
	Off	off	off	off	off	on	1
	On	off	off	off	off	on	2
	Off	on	off	off	off	on	3
	On	on	off	off	off	on	4
	Off	off	on	off	off	on	5
	On	off	on	off	off	on	6
	Off	on	on	off	off	on	7
	On	on	on	off	off	on	8
	Off	off	off	on	off	on	9
	On	off	off	on	off	on	10
	Off	on	off	on	off	on	11
	On	on	off	on	off	on	12
	Off	off	on	on	off	on	13
	On	off	on	on	off	on	14
	Off	on	on	on	off	on	15
	On	on	on	on	off	on	16

Off	off	off	off	on	on	17
On	off	off	off	on	on	18
Off	on	off	off	on	on	19
On	on	off	off	on	on	20
Off	off	on	off	on	on	21
On	off	on	off	on	on	22
Off	on	on	off	on	on	23
On	on	on	off	on	on	24
Off	off	off	on	on	on	25
On	off	off	on	on	on	26
Off	on	off	on	on	on	27
On	on	off	on	on	on	28
Off	off	on	on	on	on	29
On	off	on	on	on	on	30
Off	on	on	on	on	on	31
On	on	on	on	on	on	32

Motor speed controller board.

This board has a bank of 4 switches.

<u>pole</u>	<u>1</u>	<u>2</u>	<u>sensitivity</u>
	off	off	very high
	on	off	high
	off	on	normal run setting
	on	on	low

<u>pole</u>	<u>3</u>	<u>4</u>	<u>motor resistance to stall</u>
	off	off	normal
	on	off	slightly low
	off	on	low
	on	on	very low

Special case override setting:- All 4 poles switched ON.

Soundboard

The soundboard is located in the lower cabinet of section 2.

Attract music timer interval:-

<u>pole</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>interval / seconds</u>
	off	off	off	music off
	on	off	off	30
	off	on	off	60
	on	on	off	90
	off	off	on	120
	on	off	on	150
	off	on	on	180
	on	on	on	210

6.3 Motor jam reset switch.

The motor jam alarm can be manually reset by pressing the reset button located on the underside of the lower cabinet, section 2.

If the alarm sounds often or for no apparent reason this indicates that either the motor driver is too sensitive (see switch settings), or the drive mechanism needs lubrication. If the game tilts frequently for no reason, one of the slam tilts or pendulum needs adjusting.

6.4 Speaker.

If the speaker is suspected faulty it should be replaced with one of the same type and rating, use 8 Ohm 25 Watt.

6.5 Lighting

There are two dichroic lamps per playfield. These are rated 12v 20 Watt. Do not exceed the stated Wattage.

6.6 Counters

Electro-mechanical counters are included to enable you to monitor the performance of your pusher, and check the accounting.

Counters are incorporated for coins-in, ticket-out and swipe..

6.7 Logic & control boards

These are custom made to perform the functions necessary for correct operation of the machine. In general they are not user serviceable and should a fault arise they should be sent back to your distributor or Harry Levy Amusement Contractor Ltd for repair.

7. MECHANICAL SYSTEMS.

7.1 Pusher motor drive.

The main drive motor is situated beneath the playfield. There are mechanical linkages to the moving boxes. As long as the slide bearings are kept clean and lightly greased the system will give many years of reliable service.

A fail-safe cut-out is included on the motor to protect it from stall conditions. The motor shaft speed is monitored by a rotation opto sensor. If the system suffers a mechanical jam the reduced speed will be detected and the supply to the motor will be turned off. The alarm will sound. Switch the machine off, remove the cause of the jam and switch the machine on again. If the jam self cleared, pressing the reset button will re-start the motor.

The sensitivity of the monitoring system can be varied. See Switch Settings.

7.2 Pusher boxes.

The pusher boxes are mounted on two Accuride slide bearings. An annual check to remove any build up of dust and a light coat of grease will ensure many years of reliable service.

Ensure that the coin scraper system is fully intact and working smoothly and freely, replace any suspect parts.

7.3 Coin entry Chutes.

Each player section has two coin entry chutes. The chutes are fitted with flag opto sensors to detect coins. Other than keeping the chutes clear and clean no maintenance is required.

7.4 Count & Payout (swipe) Hoppers.

Each player section is fitted with a count & payout (swipe) hopper. Coins falling from the playfield fall down the win chute into the count hopper. The count hopper then counts the coins as they are dispensed into the payout (swipe) hopper. Once the payout (swipe) hopper is full coins overflow into the cashbox. If the machine is in a state of alarm coins falling into the count hopper will not be counted and no reward will be paid. This state remains until the alarm state is removed.

If the machine is fitted with a swipe system the payout (swipe) hopper will dispense coins to the player when the section is 'swiped'. If a particular section is swiped continuously the swipe hopper may run low on coins. If this occurs the hopper / swipe system for that section is temporarily disabled until the minimum level of coins is replenished from the playfield.

Note - Each player section works independently of the other sections.

If a fault is suspected first check for mechanical jams (a coin stuck), and rectify as appropriate. If removal of the hoppers is required, power down the machine before disconnection / reconnection. Failure to do so can damage the hopper opto.

8. FAULT FINDING

It is of mutual interest that your pusher is kept in excellent working condition, therefore when required please order original replacement parts from your distributor or Harry Levy Amusement Contractor Ltd.

If a fault occurs with any electrical system: **SWITCH THE MACHINE OFF.** Check that :-

- a) There is a suitable mains supply.
- b) All reset fuses are intact (they pop out if overloaded, push to reset).
- c) All plugs and sockets are correctly mated.
- d) No wires are trapped, damaged or broken.
- e) All wires are properly secured to their terminals and pins.

Wiring check.

A visual inspection will reveal the general condition of the wiring. A more thorough test using a continuity tester will be needed to check apparently intact wires, however once a machine has been playing successfully for some time wiring is not usually at fault.

Device testing.

Disconnect the machine from the mains supply then check the physical condition and operation of the suspect device (remove from the machine if necessary). Bench test if possible using a suitable power supply.

In general PCB's are not user serviceable. Should a problem develop indicating a board fault it is recommended that the board is returned for repair by your distributor.

Fault diagnosis and repair may be performed by skilled service personnel, but this may invalidate the warranty.

Systems checking.

When a fault occurs that affects the whole of the machine, the power supply and regulation system should be investigated first.

Check the input, and output fuses.

Refer to schematics and drawings to check power connections, voltages etc.

If the fault is not visual, or easily measurable it is often helpful to disconnect the outputs from the PSU, check that the PSU is functioning then connect the loads one at a time.

It is easy to identify the faulty system, then use a similar technique within that system (such as disconnecting all solenoids) to identify the faulty component.

<u>Symptom</u>	<u>Possible Fault</u>	<u>Remedy</u>
Will not start	Mains switch OFF Fuse blown	Check mains switch is ON Check plug fuse then internal fuses.
No sound	Volume Speaker Sound board	Adjust volume Check wiring. Replace if faulty Check power supply & connectors, replace board if faulty.
Light failed	Tube failed Starter failed Choke (ballast) failed	Check end caps & wiring Replace tube. Replace with same type. Replace with same rating.
Pusher boxes not moving	Power to motor Mechanical jam	Check power & connections. Check for coins or Swag causing jam. Clear & reset.
Tilt alarm not working	Pendulum stuck Door bump sensor Sounder	Check pendulum & adjust. Check & adjust. Test connections & power
Counter(s) not working	Wiring Counter Opto sensor	Check connectors & loom Bench test / replace. Check every opto sensor.
Top sign Not working	Power disconnected	Check connectors

9. SPARE PARTS LIST

There is a description and Harry Levy Amusement Contractor Ltd stock number to help you identify the part you require. Please quote the description and our stock number when ordering. Thank you.

<u>Description</u>	<u>Harry Levy Stock Number</u>
201 lock & keys	6278
301 lock & keys	6087
Accuride pusher box slide	6081
Counter	MN049
Electronic alarm board	7819
Filter - Mains 6A	8178
Motor	8567
Motor board	8321
Motor opto board	8318
Opto sensor - coin in	22129
Sound board	23782
Speaker	22134
Switch - reset	6127
Switch - pendulum tilt	CC004
Switch - tilt	6534

Other items are available on request.