

Inter-Office Memo

**FIELD SERVICE**  
22 NOV 1982

A T A R I  
Coin-Operated Games Division

To: Fred McCord/Eamonn McGrath

From: Sam Deus *Sam*

Subject: POLE POSITION - NAMCO BOARDS

Date: November 15, 1982

This memo is to notify you of possible repair problems with games using Namco boards. We have discovered serious timing problems in the Namco design. We have corrected these problems in U.S. boards, however, there is no good way to fix Namco boards without butchering the boards. Namco is currently getting around the problem by selecting parts. All the boards we will receive from Namco will be operational (I think). Two problem areas are:

1. On the video board location 9H 1C 74LS157, factory advises not to use Fairchild LS157's.  
Symptoms - Irregularities in motion objects  
Problems - 74LS157's are notorious in generating glitches when select line is switched which may generate improper write signals to buffer RAM. The other problem is if the part is too fast, load signal to sync counters may go away before the clock signal and result will appear as a skewed objects. The quick mickey-mouse fix for this is to put 100PF to 1000PF capacitor at the input pin 10 or 14 to delay the signal.
2. On the CPU board location 7J, 7H and 8H, 1C's 74L157 and 2148's (8148 or 2149).  
Symptoms - Garbled music (should not effect engine sound or voice).  
Problems - Again output glitches on 74LS157 and propagation delay of the RAMS. Parts lists call for 55NS (access time) RAMS as a replacement for 7H and 8H, however, it is not fast enough in worst case conditions. The parts NAMCO is selecting are around 25NS access time which no manufacturer guarantees. Increasing the size of the C70 capacitor from 33PF to 100PF may help.

I will be glad to support you if you need help. These boards are too expensive to scrap. In addition, there are two more items I would like to inform you on:

1. There should be 4.7K pull-down resistor on the board near the edge connector (CPU) at the brake input. This modification does not effect the upright cabinets (since brake is grounded)

but needed in sitdowns. However, this resistor needed in all boards to keep the interchangeability between uprights and sitdowns.

2. Pull out the three EPROMS from the CPU board. These are labeled PP2-12, 13 and 14. These will eliminate only the crowd cheering sound when the goal is reached. PROMS of course, are reusable and should go into stock.

SD:jdh

cc: Steve Calfee  
Chris Downend

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1. On the video board location 3H IC 74S157, factory advised not to use Fairchild 157's.  
Symptoms - Irregularities in which objects  
Problems - 74S157's are notorious in generating glitches when select line is switched which may generate improper write signals to buffer RAM. The other problem is if the part is too fast, load signal to sync counters may go away before the clock signal and result will appear as a skewed objects. The quick wicky-gimme fix for this is to put 100NF to 1KMF capacitor at the input pin 10 or 14 to delay the signal.
2. On the CPU board location JJ, JI and JH, IC's 74S157 and 2148's (8148 or 2148).  
Symptoms - Garbled music (should not affect engine sound or voice).  
Problems - Again output glitches on 74S157 and propagation delay of the 8148. Parts lists call for 15MS (max) 74S157 and as a replacement for JJ and JI, however, it is not fast enough in worse case conditions. The parts 8148's in selecting are around 245 access time which no manufacturer guarantees. Increasing the size of the CPU capacitor from 100NF to 1000NF may help.

I will be glad to support you if you need help. These boards are too expensive to scrap. In addition, there are two more items I would like to inform you on:

1. There should be a 4.7K pull-down resistor on the board near the edge connector (CPU) at the brake input. This modification does not affect the upright cabinets (since brake is grounded)

Inter-Office Memo

A T A R I  
Coin-Operated Games Division

**FIELD SERVICE**

To: Dave Rogers  
From: Sam Deus *Sam*  
Subject: MODIFICATION/POLE POSITION BOARDS

22 NOV 1982

M.O.R.  
F. Murphy, T. Green, K. Hayes  
Date: November 9, 1982

This memo is to document the modification need on the NAMCO Pole Position boards. The attached blue line shows where to solder the 4.7K OHM pull down resistor on the CPU PC board.

This modification pulls down Pin 13 (brake) input to the ground through 4.7K OHM resistor.

SD:jdh  
Attachment

cc: Chris Downend  
Eamonn McGrath, Ireland

Inter-Office Memo

**FIELD SERVICE**  
22 NOV 1982

A T A R I  
Coin-Operated Games Division

To: Chris Downend

From: Sam Deus *Sam*

Subject: COIN INPUT PROBLEM/POLE POSITION

Date: November 2, 1982

As you know, we detected a coin input nuisance problem on the Pole Position sitdown version, when two coins one credit option is selected.

To refresh your memory, the nature of the problem is: When a player puts a coin into coin input A and another into coin input B, the game does not register these as one credit until another coin comes in on either coin input A or B. What's more, the game totally forgets one of the first two coins at the end of the game depending upon where the third coin went in. I have mentioned this problem to Mr. Tashiro when he was visiting Atari. His response was (which we had already guessed) that the coin inputs are handled by custom chip. The custom chip is initialized at the beginning of the game from option switch settings and it keeps track of the coin counts and lets the program know when there is a credit. The program cannot keep track of the coin inputs. Therefore, there is no easy software solution and as you probably have guessed, changing the custom chip to do what we want is out of the question for all practical purposes. Of course the problem is typical for all multiple coin-one credit option selections. So far I have not received an official response from Namco which I relayed the problem through Riv on October 14, 1982.

The possible solutions to this problem are as follows:

1. Pursue the issue with Namco so they make both required hardware (custom chip redesign) and software changes (not enough time to catch all of the production run of sitdowns).
2. Seal the second coin input on all the sitdowns.
3. Put a label on top of coin mechanisms advising the player to put all the coins into one coin mechanism.
4. Live with the problem and advise the operators that players will be coming to them complaining that they lost a quarter and it is possible in multiple coin option settings.
5. Wire both coin input mechanisms into one coin input only and lose the split coin selection option.

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- 6. Use a combination of the above solutions.

I have looked at other hardware solutions and they are not practical (requires an addition of decoder PROM). I need your advice as soon as possible. For additional information, please see attached coin option list.

SD:jdh  
Attachment

- cc: Dan Van Elderen  
Dennis Hawes  
Mary Fujihara  
Beth Falconer  
Steve Calfee

we detected a coin input nuisance problem on the Atari version, when two coins one credit option is selected. In your assembly, the nature of the problem is: When a two coin input is used, the game totally forgets one of the first two coins at the end of the game depending upon where the third coin went in. I have mentioned this problem to Mr. Tashiro when he was visiting Atari. His response was (which we had already guessed) that the coin inputs are handled by custom chip. The custom chip is initialized at the beginning of the game from option switch settings and it keeps track of the coin counts and lets the program know when there is a credit. The program cannot keep track of the coin inputs. Therefore, there is no easy software solution and as you probably have guessed, changing the custom chip to do what we want is out of the question for all practical purposes. Of course this problem is typical for all multiple coin one credit option selections. So far I have not received an official response from Namco which I relayed the problem through Riv on October 14, 1982.

The possible solutions to this problem are as follows:

1. Pursue the issue with Namco so they make both required hardware (custom chip redesign) and software changes fast enough time to catch all of the production run of machines.
2. Seal the second coin input on all the machines.
3. Put a label on top of coin mechanisms advising the player to put all the coins into one coin mechanism.
4. Live with the problem and advise the operators that players will be coming in there complaining that they lost a quarter and it is possible in multiple coin option settings.
5. Wire both coin input mechanisms into one coin input only and lose the split coin selection option.



INTER-OFFICE MEMO

TO : K.Hayes, F.Murphy, T.Guerin, M.O'Rourke , F. Martindale.  
FROM : E.Mc Grath DATE : 24/11/82.  
SUBJECT : Modifications to Namco PCB's as of 22nd Nov.

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This memo documents all Modifications to the PCB that we are aware of.

1. 4.7k OHM resistor to be installed , to ground the brake input on the CPU PCB (see attachment 1).
2. Three E Proms, PP2 - 12, 13 and 14 must be removed from the CPU PCB. These can be programmed and added to stock. (attachment 1).
3. Six E Prpms and 1 Prom from the Video PCB must be reprogrammed We will reprogram the E Proms with the new program which Kevin Hayes is bringing over.  
Since we do not have the prom blowing attachment K. Hayes is bringing over 100 proms for start up. The States may continue to supply us with this rom , alternatively it has been suggested that we purchase the attachment.
4. For our Coinage requirements , it is necessary that the Coin 1 options be on the right coin Mech (50p). This necessitates a swop of the Coin 1, Coin 2 wires at the Edge Connector. M.Spooner has been made aware of this and an ECN is in process.

Encl / 4 Copies.



INTER-OFFICE MEMO

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FIELD SERVICE

24 NOV 1982

M.O.R.  
T. Green, F. Hayes

TO :

FROM : E.Mc Grath.

DATE :

24/11/82.

SUBJECT :

This memo is to document the modification need on the 18KCO Pole Position boards. The attached blue line shows where to solder the 4.7K resistor to the CPU IC board.

This modification pulls Switch Pin 13 (Drake) input to the ground through 4.7K 075 resistor.

5. Coin Option Interconnect Assy.

USA have found a problem in the Coin Inputs when options are set at two coins 1 play or greater. Both coins must be put in the one slot, otherwise the player loses a credit (see attachment 2 ).

The solution chosen was no 5 on the attachment sheet 2 and this was brought about by using an additional Coin Option Interconnect Assy.

This assy is necessary for all Coin Doors with identical Left and Right Mechs. eg. 25¢, 25¢ Canadian and most Scandanavian Countries. It is not necessary for doors with different denominations eg 20p,-50p, 1dm-5dm.

The project engineer suggests that we ship the Interconnect Assy as a kit. The Manual will detail its use.

cc: Steve Calfee  
Chris Downard

FIELD SERVICE  
22 NOV 1982

Enc1/ 4 copies.

Inter-Office Memo

A T A R I  
Coin-Operated Games Division

**FIELD SERVICE**

To: Dave Rogers  
From: Sam Deus *Sam*  
Subject: MODIFICATION/POLE POSITION BOARDS

22 NOV 1982

M.O.R.  
F. Musher, T. Guerin, K. Hayes  
Date: November 9, 1982

This memo is to document the modification need on the NAMCO Pole Position boards. The attached blue line shows where to solder the 4.7K OHM pull down resistor on the CPU PC board.

This modification pulls down Pin 13 (brake) input to the ground through 4.7K OHM resistor.

SD:jdh  
Attachment

cc: Chris Downend  
Eamonn McGrath, Ireland

but needed in sitdowns. However, this resistor needed in all boards to keep the interchangeability between uprights and sitdowns.

2. Pull out the three EPROMS from the CPU board. These are labeled PP2-12, 13 and 14. These will eliminate only the crowd cheering sound when the goal is reached. PROMS of course, are reusable and should go into stock.

SD:jdh

cc: Steve Calfee  
Chris Downend

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22 NOV 1982



Inter-Office Memo

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22 NOV 1982

A T A R I  
Coin-Operated Games Division

To: ~~Chris Downend~~

From: Sam Deus *Sam*

Subject: COIN INPUT PROBLEM/POLE POSITION Date: November 2, 1982

As you know, we detected a coin input nuisance problem on the Pole Position sitdown version, when two coins one credit option is selected.

To refresh your memory, the nature of the problem is: When a player puts a coin into coin input A and another into coin input B, the game does not register these as one credit until another coin comes in on either coin input A or B. What's more, the game totally forgets one of the first two coins at the end of the game depending upon where the third coin went in. I have mentioned this problem to Mr. Tashiro when he was visiting Atari. His response was (which we had already guessed) that the coin inputs are handled by custom chip. The custom chip is initialized at the beginning of the game from option switch settings and it keeps track of the coin counts and lets the program know when there is a credit. The program cannot keep track of the coin inputs. Therefore, there is no easy software solution and as you probably have guessed, changing the custom chip to do what we want is out of the question for all practical purposes. Of course the problem is typical for all multiple coin-one credit option selections. So far I have not received an official response from Namco which I relayed the problem through Riv on October 14, 1982.

The possible solutions to this problem are as follows:

1. Pursue the issue with Namco so they make both required hardware (custom chip redesign) and software changes (not enough time to catch all of the production run of sitdowns).
2. Seal the second coin input on all the sitdowns.
3. Put a label on top of coin mechanisms advising the player to put all the coins into one coin mechanism.
4. Live with the problem and advise the operators that players will be coming to them complaining that they lost a quarter and it is possible in multiple coin option settings.
5. Wire both coin input mechanisms into one coin input only and lose the split coin selection option.



INTER-OFFICE MEMO

TO : *Distribution*  
FROM : *Eamonn McGrath*  
SUBJECT : *Pole Position Option Settings*

DATE : *3rd December, 1982*

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*Attachment 1 and 2 details the mistakes I have found in the Pole Position Supplement Manual. I have informed Sam Deus, Project Engineer, of these and he will have a Stuffer Sheet done up to cover these. We have agreed that both sitdows and uprights should be sent out at the one setting of 90secs per lap, 3 racing laps. This limits the duration of the game to under three minutes, and means more money in the cashbox for operators.*

*EMCG/vh*

*Distribution:*

*K. Hayes  
T. Guerin  
F. Murphy  
N. Joyce  
J. Hamilton*

7-12-82

From the Desk of: EAMONN McCRATH

To: J. Hamilton, F. Murphy.

Games which are going to  
Canada must now be sent  
on 50¢ (2 coins 1 play) and  
the MORE LIBERAL SETTINGS OF

120 sec PLAY }  
4 RACING LAPS }

The Canadian Games will have  
the option Coin Interconnect Assy  
installed, along with the following  
Currencies

Tokens  
25¢ USA  
BELGIAN Francs  
1 Norwegian Krong  
1 Swedish KRONA  
1000 - ITALY



INTER-OFFICE MEMO

TO : Tony Guerin cc K.Hayes.  
FROM : Eamonn Mc Grath *eml*  
SUBJECT : Pole Position Options.

DATE : December 1st 1982.

The attached information details the set up requirements for Final Q.C. of Pole Position Sitdown.

The only difference between Pole Position Sitdown and Upright options is that the Sitdown is set out at a game time of 120 seconds and 4 laps.

The Upright is set for 90 seconds, 3 laps.

The reason for this is that the Sitdowns in USA are set out at 50 cents a play. The Uprights are at 25 cents a play.

As all of our games will be going out at the equivalent of 25¢ i.e 20p, 2 francs etc, should we adopt a midrange setting e.g. 100 seconds.

Your comments please.

*Note the Manuals have different Settings  
Suggested for u/r and Sitdown*

Inter-Office Memo

A T A R I

Coin-Operated Games Division

To: Bob Burkhardt  
From: Dave Wiebenson  
Subject: Pole Position

22 NOV 1982  
**FIELD SERVICE**

cc. Quality Control  
S. Hamilton  
T. Green  
M.P. Rourke

Date: 10/13/82

REQUIREMENTS FOR VIDEO DISPLAY

1. Colors: The sky is blue, grass is green, roadway is dark grey with a white dashed center line, car tires are black with grey highlights, overhead "START" is red on yellow background. Car is orange, red, and blue. Self test has white letters on blue background.
2. Size: the picture is to extend to the top and bottom of the Bezel; no black outline is to show on top or bottom. The picture is to extend to the left and right of the Bezel plus or minus .250 inch.
3. Tilt: the picture is to be tilted no more than .250 inch.
4. Visibility: the player's score, lap time, and speed, and the top score are to be completely visible within the Bezel. In self test when the auxiliary coin switch is pressed, the two rows of numbers at the bottom of the screen are to be completely visible.

REQUIREMENTS AND SETTINGS IN SELF TEST

1. Neither brake nor gas pedal is to be depressed while the game is going into self test.
2. Once the game is in self test, the following parameters must be met:
  - A. RAM ok ROM ok
  - B. Depress gas pedal. The two digit number by "ACCEL" is to increase linearly from 00 up to a value between 90 and A0.
  - C. Depress the brake. The number by "BRAKE" is to switch from 00 to a value between 90 and A0. (Note: on the upright version, the brake is a ~~pushbutton switch on the accessory bracket inside the coin door~~). **GROUNDING AT EDGE CONNECTOR**
  - D. Turn the steering wheel right. The number by "STEERING" is to increase. Turn the wheel left and the number is to decrease.
  - E. "SHIFT" is to be "LO" when the gearshift is up, and "HI" when the gearshift is down.

\* = SUGGESTED SETTINGS Sit Down

F. For the sit down games, the option switches at location 7E on the Namco PCB and location 9Ja on the Atari PCB are to be set so that 1 is on, 2 is on, 3 is off, 4 is on, 5 is off, 6 is on, 7 is on, and 8 is on.

The option switches at location 9E on the Namco PCB and location 9L on the Atari PCB are to be set so that 1 is off, 2 is on, 3 is off, 4 is on, 5 is off, 6 is off, 7 is on, and 8 is on.

The self test display is to show that coin 1 is 2 coins - 1 credit, coin 2 is 2 coins - 1 credit, time is 120, goal is 4, extended rank is B, and practice rank is C.

For the upright games all settings are the same except all switches on 7E or 9Ja are to be off so that coin 1 is 1 coin - 1 credit, coin 2 is 1 coin - 1 credit, time is 90, and goal is 3.

G. "AUTO START" is to be indicated on the self-test display.

H. On the Atari PCB only, the switch at location 6B is to be put in the off position.

I. Depress the gas pedal. Turn each volume control up and down one at a time to verify that all 4 (2 on upright) speakers are working and are independent of each other. Then turn all volume controls clockwise to maximum volume. Turn the two rear speakers (top speaker on upright) down using the two right most volume controls (left volume control on upright) until the sound at the player's normal playing position is equalized.

DW/br

*NOTE: SINCE THIS GAME USES TWO AUDIO REG BRDS.*

*I ADVISE TO CHECK THE +5V SUPPLY ON BOTH BOARDS TO SEE HOW CLOSE THEY TO +5VOLTS ON VERY FIRST RUNS,*

110	OFF	ON	
120	ON	ON	*
3			OFF
4			ON *

\* - SUGGESTED SETTINGS SIT-DOWN ONLY

\* = SUGGESTED SETTINGS SIT DOWN

DIP SW. 7E

**FIELD SERVICE**  
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	Content	Status Of Switch							
		1	2	3	4	5	6	7	8
COIN 1	1 coin / 1 cr.	OFF	OFF	OFF					
	1 / 2	ON	OFF	OFF					
	1 / 3	OFF	ON	OFF					
	2 / 1	ON	ON	OFF					
	3 / 1	OFF	OFF	ON					
	3 / 2	ON	OFF	ON					
	4 / 3	OFF	ON	ON					
	Free Play	ON	ON	ON					
COIN 2	1 coin / 1 cr.				OFF	OFF			
	2 / 1				ON	OFF			
	3 / 2				OFF	ON			
	4 / 3				ON	ON			
TIME	90						OFF	OFF	
	100						ON	OFF	
	110						OFF	ON	
	120						ON	ON	
GOAL	3								OFF
	4								ON
<del> </del>									

Left.

Right

\*

\*

\* - SUGGESTED GAME SETTINGS SIT-DOWN ONLY

\* - SUGGESTED SETTINGS SIT DOWN

(NB)

FOR IRELAND / UK, SW 7 TO BE "ON" FOR M.P.H.

FOR CONTINENT, FRANCE, GERMANY, SW 7 TO BE OFF FOR K.P.H.

POLE POSITION

DIP SW . 9E .

CONTENT	STATUS OF SWITCH							
	1	2	3	4	5	6	7	8
EASIEST. A	OFF	OFF	OFF					
B	ON	OFF	OFF					
C	OFF	ON	OFF					*
D	ON	ON	OFF					
E	OFF	OFF	ON					
F	ON	OFF	ON					
G	OFF	ON	ON					
MOST DIFFICULT H	ON	ON	ON					
EASIEST LAP A				OFF	OFF	OFF		
B				ON	OFF	OFF		*
C				OFF	ON	OFF		
D				ON	ON	OFF		
E				OFF	OFF	ON		
F				ON	OFF	ON		
G				OFF	ON	ON		
MOST DIFFICULT H				ON	ON	ON		
KILOMETRES / HR							OFF	
MILES / HR							ON	*
SOUND OFF								OFF
SOUND ON								ON

ADDRESS RANGE

EXTENDED RANGE

DUAL-COUNTRY 200A-1-1-20

DUAL-COUNTRY 200A-1-1-20

ANODE TEST

\* = SUGGESTED SETTINGS Sit Down

(NB)

\*