



**FINAL SPECIFICATION**  
FOR  
**BALL & SHOOTING**  
**LCD GAME**  
HCS-G002-0

**HICO INDUSTRIAL COMPANY**  
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HCS-G002-0

### **SPECIFICATION FOR BALL AND SHOOTING LCD GAME**

**PROJECT CODE: HCS-G002-0**

**MCU SELECTED: LC573202A**

**DATE: JUNE 6, 98**

#### I. GENERAL DESCRIPTION

A 4-bit single chip microcomputer is implemented into two LCD games. It can be one single game or 2 games with 2 LCD modules changed. Specific features are as follows:-

- 1.1 2 games in one chip by bonding option(refer to circuit) - Tennis game and Shooting game.
- 1.2 Bonding option (refer to circuit) to select time function or without time function.
- 1.3 Shooting game option can be selected by the key when bonding option is Tennis game. Changes LCD module correspondingly.
- 1.4 Tennis game option can be selected by the key when bonding option is Shooting game. Changes LCD module correspondingly.
- 1.5 Clock with 12/24 hour format can be selected by a key.
- 1.6 The daily alarm time melody can be stopped by any key.
- 1.7 Sound for the game can be on or off by pressing the key.
- 1.8 Demo mode is available.
- 1.9 Tests alarm melody when power is reset.
- 1.10 Operation Voltage: 1.5 volt.



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- 1.11 RC oscillation.
- 1.12 Direct drive LCD 1/4 duty 1/2 bias at 3 volt.
- 1.13 4 operation buttons.
- 1.14 Chime function is available.



## **II. GAME DESCRIPTIONS**

### **2.1 Tennis Game**

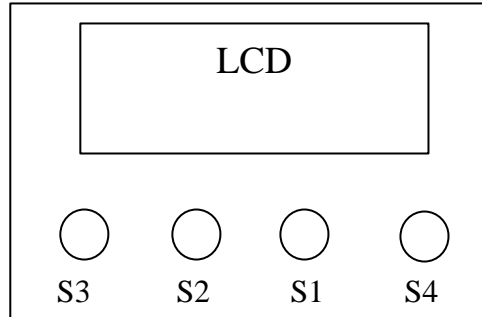
- 2.1.1 Game A and B are available with different speed.
- 2.1.2 Game player can control S3 and S4 buttons to move the tennis player left and right correspondingly (positions P1, P2, P3 & P4)for catching balls.
- 2.1.3 Balls are moving along with different paths as shown in the game. A successful catching will have the symbol shown (W1, W2, W3 & W4).
- 2.1.4 If the game player fails to catch balls, the balls will fall behind the tennis player at positions(F1, F2, F3 & F4). A missing will be made a record; three missing causes a game over.
- 2.1.5 Every 200 points will clear the missing record.
- 2.1.6 The ball speed is various randomly.
- 2.1.7 Extra point can be obtained for the bonus by catching the cup in the game.
- 2.1.8 29 and 30 are only for animation
- 2.1.9 The maximum score is 999.

### **2.2 Shooting Game**

- 2.2.1 Game A and B are available with different speed.
- 2.2.2 Player can control S3 and S4 to move the battle ship left or right correspondingly to avoid from being hit or fire from different position.
- 2.2.3 Bomb is moving at 0.4 sec interval for game A and 0.2 sec interval for Game B.
- 2.2.4 If the battle ship is hit by a bomb, a hit will be recorded. Three hit causes a game over.
- 2.2.5 Every 200 point will clear the hit record.
- 2.2.6 Player can press S1 or S2 to fire from the battle ship in game playing mode.
- 2.2.7 Missile launched from the battle ship is moving at 0.2 sec interval.
- 2.2.8 The jet fighters are moving along the path randomly.
- 2.2.9 The player can get a bonus play that has no bombing by 3 connections with C3 which happens randomly.
- 2.2.10 The fighter speed is various randomly.
- 2.2.11 The maximum score is 999.



## III KEY OPERATION DESCRIPTIONS



### 3.1 S1

Mode change – Game A to Game B, Game B back to A.

Toggles the alarm on/off in alarm display mode and chime on/off with holding S4. Game sound is on when either alarm sound or chime sound is on.\*

Increment by one step of selected digit in time setting mode.\*

Selects the Shooting Game which bonding option is the Tennis Game when the power is reset.

### 3.2 S2

Selects 12 or 24 hour display format in time setting mode.\*

Starts a game in demo mode or game over mode.

### 3.3 S3

Enters and exits the time setting mode.\*

Moves the player to the left by one step in game playing mode.

### 3.4 S4

Toggles sound on or off in game demo mode only in non-clock option.

Enters and exits alarm display mode in demo mode.\*

Selects hour and minute in time setting mode.\*

Moves the player to the right by one step in game playing mode.

Note: Pressing S1, S2, S3 and S4 simultaneously will reset the unit.

\* = invalid when n bonding option is selected without time function.



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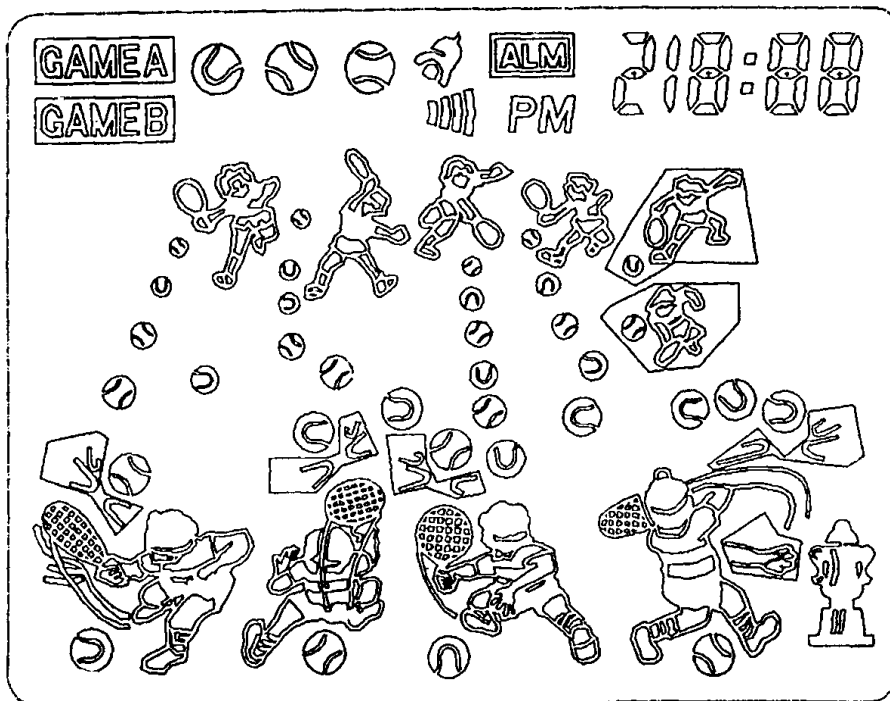
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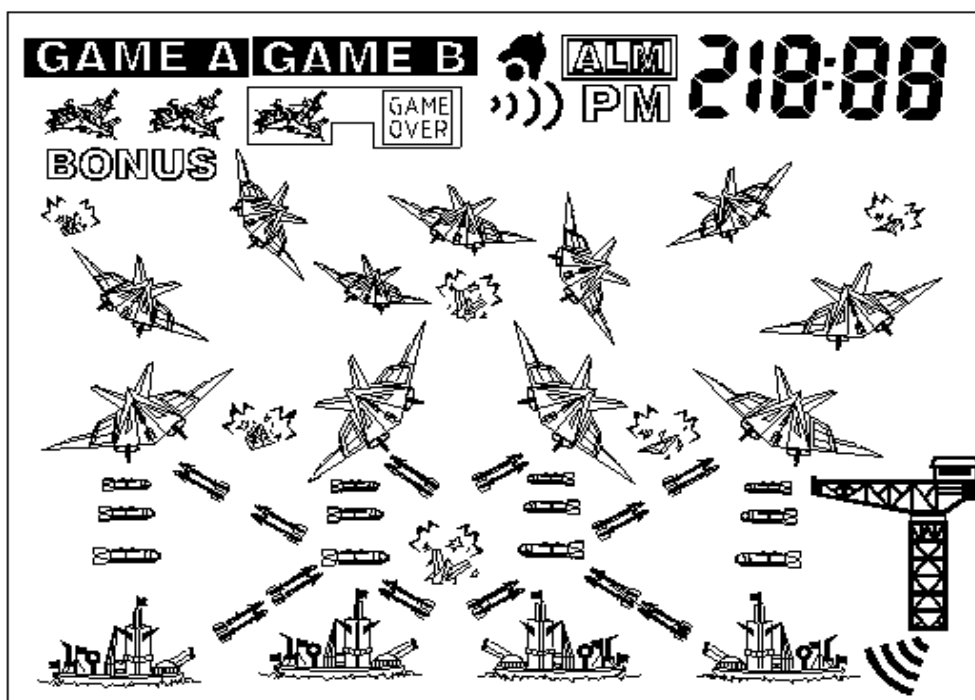
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## IV LCD PATTERN

### 4.1 Tennis Game



### 4.2 Shooting Game







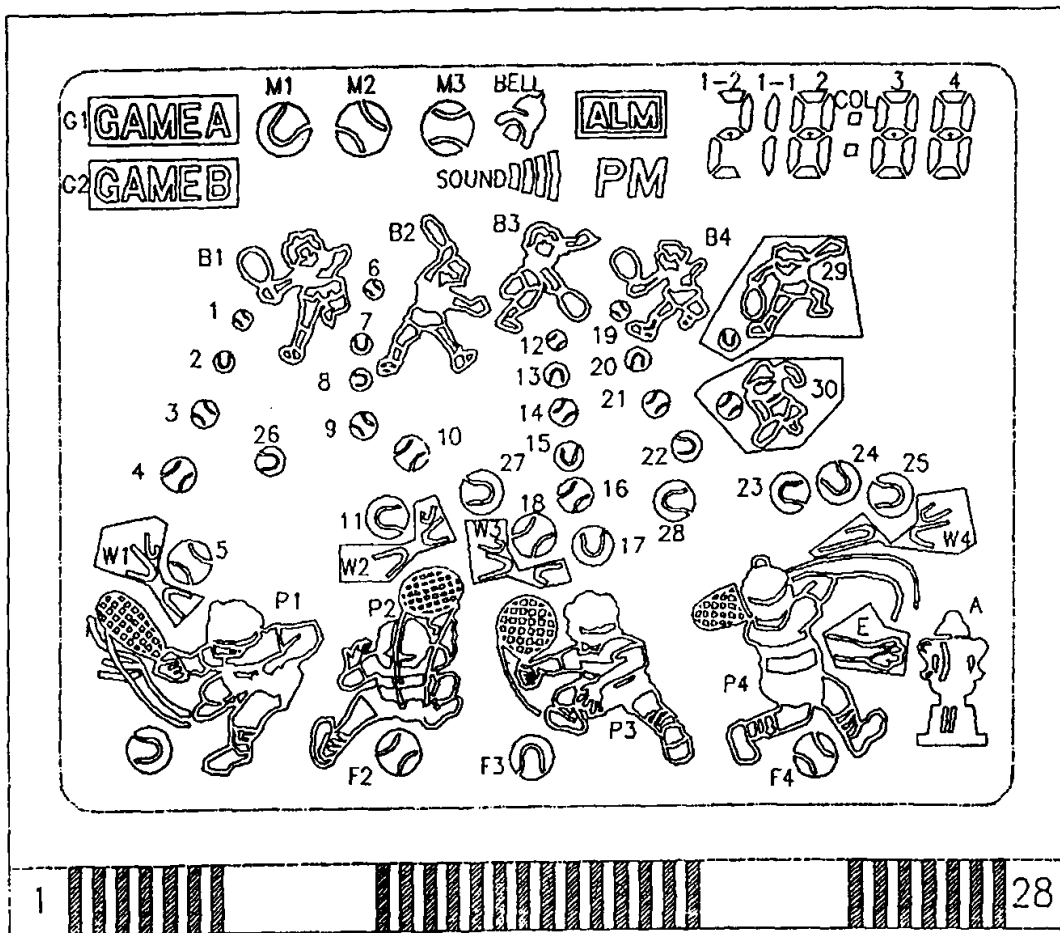




VI LCD ASSIGNMENT

6.1 Tennis Game

6.1.1 LCD pattern with labels





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## 6.1.2 Tennis Game LCD Assignment Table

Pad No.	LSI Name	COM1	COM2	COM3	COM4
1	SEG7	---	---	---	---
2	SEG8	---	---	---	---
3	SEG9	14	15	1-2	B4
4	SEG10	12	13	ALM	PM
5	SEG11	SOUND	B3	M3	BELL
6	SEG12	7	8	M2	B2
7		---	---	COM3	---
8		---	---	---	COM4
9	SEG14	B1	1	G1	G2
10	SEG15	2	3	M1	6
11	SEG16	5	W1	F1	P1
12	SEG17	26	4	P2	F2
13	SEG18	10	9	W2	11
14	SEG19	W3	18	F3	P3
15	SEG20	16	27	P4	17
16	SEG21	24	28	W4	25
17	SEG22	A	30	F4	E
18	SEG23	21	23	---	29
19	SEG24	4E	4F	---	4D
20	SEG25	4G	4B	4A	4C
21		COM1	---	---	---
22		---	COM2	---	---
23	SEG1	3C	3B	3A	3D
24	SEG2	3E	3G	3F	COL
25	SEG3	2C	2B	2A	2D
26	SEG4	2G	2F	---	2E
27	SEG5	20	22	1-1	19
28	SEG6	---	--	---	---



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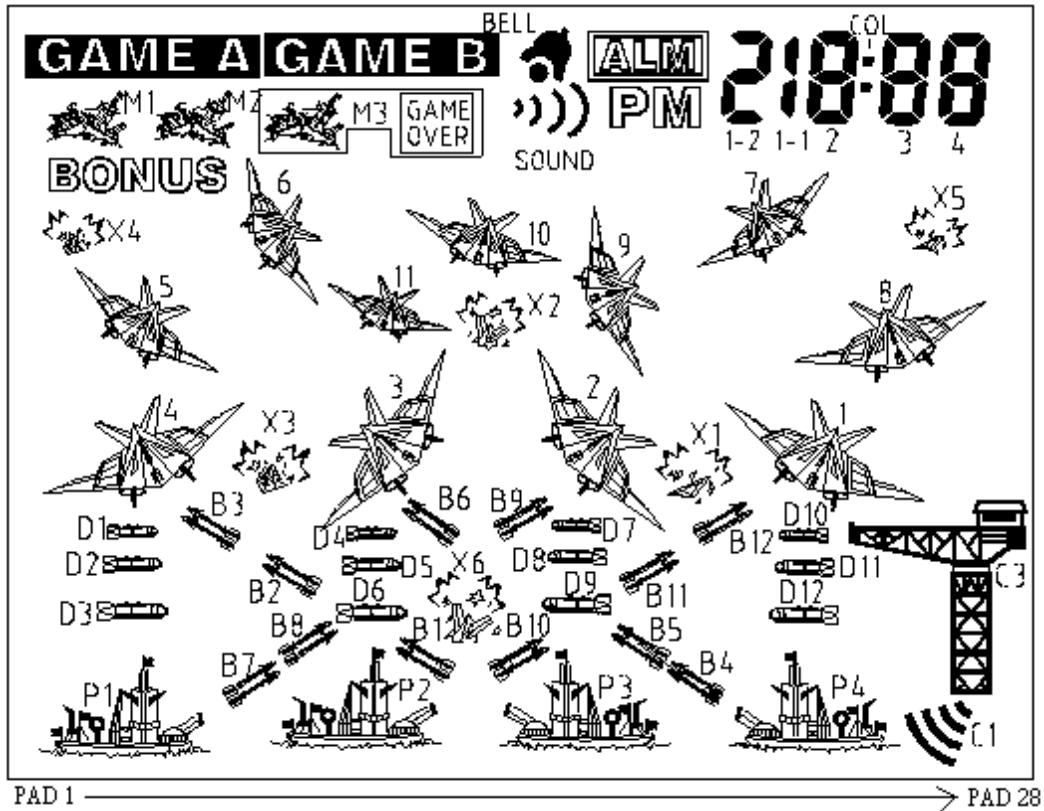
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## 6.2 Shooting Game

### 6.2.1 LCD pattern with labels





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## 6.2.2 Shooting game LCD assignment table

Pad No.	LSI Name	COM1	COM2	COM3	COM4
1	SEG7	---	---	---	---
2	SEG8	X1	2	7	9
3	SEG9	X2	3	1-2	10
4	SEG10	11	X3	ALM	PM
5	SEG11	SOUND	5	M3	BELL
6	SEG12	X4	4	M2	6
7		---	---	COM3	---
8		---	---	---	COM4
9	SEG14	---	D3	GAME A	GAME B
10	SEG15	B7	D2	M1	BONUS
11	SEG16	B8	D1	D6	P1
12	SEG17	D5	B3	P2	B10
13	SEG18	B2	D4		B1
14	SEG19	X6	B6	D9	P3
15	SEG20	B9	---	P4	B11
16	SEG21	D8	D7	B4	B5
17	SEG22	C3	B12	D11	C1
18	SEG23	D10	---	---	D12
19	SEG24	4E	4F	---	4D
20	SEG25	4G	4B	4A	4C
21		COM1	---	---	---
22		---	COM2	---	---
23	SEG1	3C	3B	3A	3D
24	SEG2	3E	3G	3F	COL
25	SEG3	2C	2B	2A	2D
26	SEG4	2G	2F	---	2E
27	SEG5	8	1	1-1	X5
28	SEG6	---	--	---	---



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