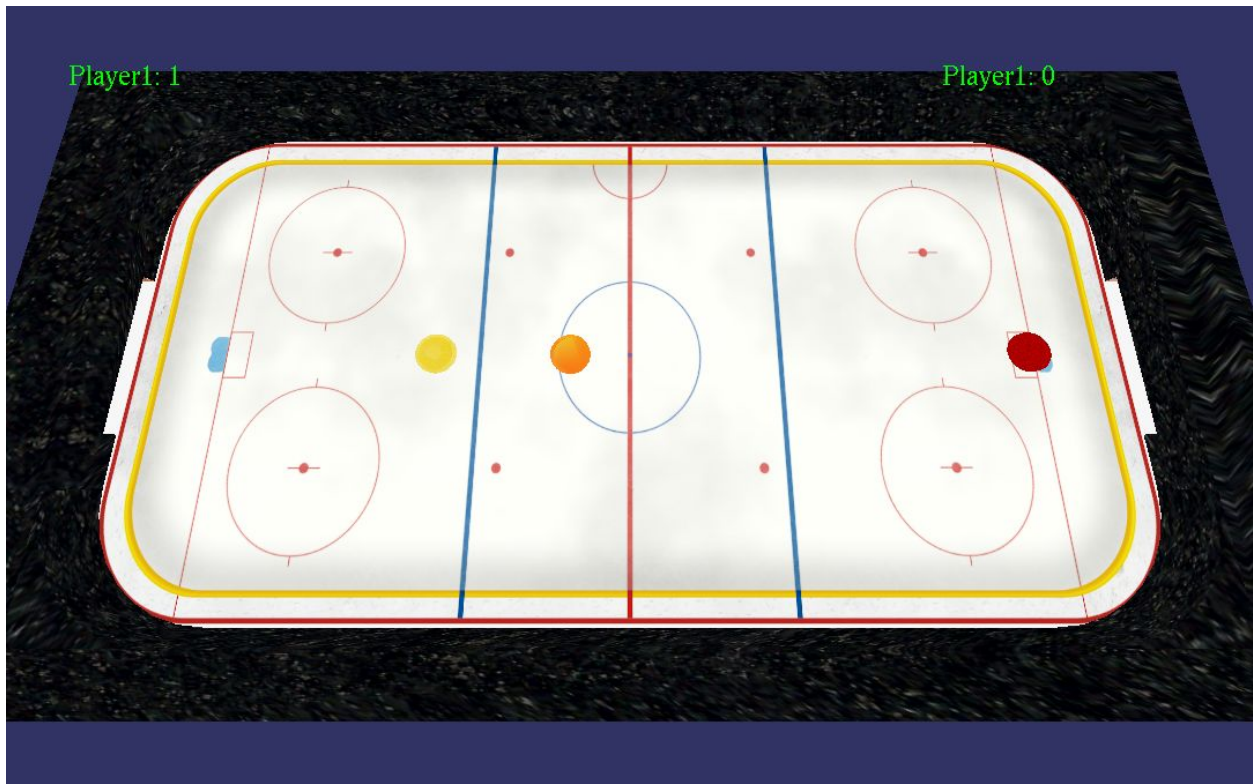


User Manual

PA 9 - Air Hockey

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To compile/run the program from the PA9/bin/ folder:

```
make -C ../build
```

Then

```
./Hockey
```

Extra Credit

For extra credit, we have sound effects, a top 10 scores history, Text2D displayed, Game replay, changeable puck shape with correct physics, changeable paddle shape, a simple AI, and a toggleable AI.

Required Libraries

In order to compile and run this program, some additional programs/libraries must be downloaded and installed. These programs/libraries are:

Magick++
Assimp
OpenGL
Bullet
Irrklang Audio Library

Setting Up Magick++

In your .cpp file, include:

```
#include <Magick++.h>
```

And initialize in main:

```
Magick :: InitializeMagick(*argv);
```

In the makefile, add:

```
LDFLAGS = `Magick++-config --cppflags --cxxflags --ldflags --libs`
```

and then add LDFLAGS to the compilation line like this :

```
$(CC) $(CXXFLAGS) ../src/shader.cpp ../src/main.cpp -o ../bin/Solar $(LDFLAGS)
```

Also, don't forget to add -lMagick++ to the LIBS to use.

Install these libraries with sudo apt-get install:

(These are the libraries installed on the ECC computers)

libgraphicsmagick3
libgraphicsmagick1-dev
libgraphics-magick-perl
libgraphicsmagick++1-dev
libmagickcore5-extra
libmagickwand5
imagemagick
libgraphicsmagick++3
graphicsmagick-libmagick-dev-compat
libmagickcore5

imagemagick-common

Or you can follow the installation instructions from:

<http://www.imagemagick.org>

To customize the installation.

Setting Up Assimp

To install Assimp, type:

```
sudo apt-get install libassimp-dev
```

Then modify your makefile to include `-lassimp` in the `LIBS` section:

```
LIBS= -lglut -lGLEW -lGL -lGLU -lassimp -lMagick++
```

Note: `-lMagick++` is also added to use `Magick++`

In your `main.cpp`, you also need to add a few lines:

```
#include <assimp/Importer.hpp>
#include <assimp/scene.h>
#include <assimp/postprocess.h>
#include <assimp/color4.h>
```

Setting Up OpenGL

Most operating systems have some version of OpenGL on them but to run our program, a few additional programs need to be installed. The first two are GLUT and GLEW which can be easily installed with:

```
sudo apt-get install freeglut3-dev freeglut3 libglew1.6-dev
```

If you can type:

```
glxgears
```

into the terminal and some rotating gears appear, then you should have installed everything for OpenGL correctly.



Figure 1: If you can see these gears, then OpenGL should be installed correctly.

You will also need GLM which can be installed by typing:

```
sudo apt-get install libglm-dev
```

Setting Up Bullet

Bullet is a physics library that can be used in C++ but requires a few steps before it can be used. It can be installed in the command line with:

```
sudo apt-get install libbullet-dev
```

The makefile must be modified to include

```
LIBS = -I/usr/include/bullet -lBulletDynamics -lBulletSoftBody -  
lBulletCollision -lLinearMath
```

The Header file needs:

```
#include <btBulletDynamicsCommon.h>
```

Some resource for Bullet are:

http://bulletphysics.org/mediawiki-1.5.8/index.php/Collision_Filtering

http://bulletphysics.org/mediawiki-1.5.8/index.php/Stepping_the_World

http://bulletphysics.org/mediawiki-1.5.8/index.php/Hello_World

http://bulletphysics.org/mediawiki-1.5.8/index.php/Tutorial_Articles

Setting Up Irrklang audio library

Irrklang is a cross platform sound library for C++, C# and all .NET languages, essentially, it is free for non-commercial, while there is a pro version that comes with more features than the free. Since this is not offered on GitHub it is much harder to attain it than by just doing `sudo apt-get install lib`.

Instructions for usage:

1. To download, go to <http://www.ambiera.com/irrklang/>, and click download and download the zip file Irrklang has available, and it will come in as a zip file
2. Extract the zip file and run the hello world or any program to see if it works and is not corrupted
3. From there, extract the folder specifically catered to your OS. Since this class is using Linux, grab linux-gcc-64, along with the include folder which will host most of the header files.
4. From there go into your makefile and add this line or equivalent file location:
`OPTS = -I"../src/include" ../src/linux-gcc-64/libIrrKlang.so -pthread`
5. From there, add it to compiler flag just like you would with LIBS, something along the lines of this:
`$(CC) $(CXXFLAGS) ../src/shader.cpp ../src/main.cpp -o ../bin/Bullet $(LDFLAGS) $(LIBS) $(OPTS)`
6. Within your .cpp file or wherever you are running it, `#include<irrKlang.h>` and if you want to use the namespace you can just by doing using namespace irrKlang
7. From there, the program should be compilable and you can start using irrKlang for a

lot

of different sound libraries.

Compiling the Program

To compile the program, from the build folder:	<code>make</code>
Or from the PA7 folder type:	<code>make -C ../build</code>
Or from the bin folder type:	<code>make -C ../build</code>

Executing the Program

To run the program, from the bin folder, type:	<code>../Hockey</code>
--	------------------------

Program Implementation Details

AI

The simple AI player works by keep track of a few variables and making a decision on what to do. In order to keep the game fun, we made it so it is not unbeatable. Some of the variables that the AI keeps track of include which side the puck is on, which direction the puck is moving, how far away the puck is from the AI's paddle, and a few other important details. With these details, the AI can decide things such as whether to move farther away from its goal and whether to hit the puck.



Figure 2: The AI is about to hit the puck and try and make a goal.

Swapping Out the Paddles and Pucks

To switch the regular paddles and pucks to the square pucks, we followed a nearly identical series of steps. For both sets of paddles and pucks, we had models that we created in Blender, loaded into our program with Assimp, textured with Magick++, and set up collisions for with Bullet. However, once the program receives an input to switch out the paddles or pucks, it swaps the vbo geometry and then the new paddle or puck is being displayed at the same position but with the new model and correct physics.

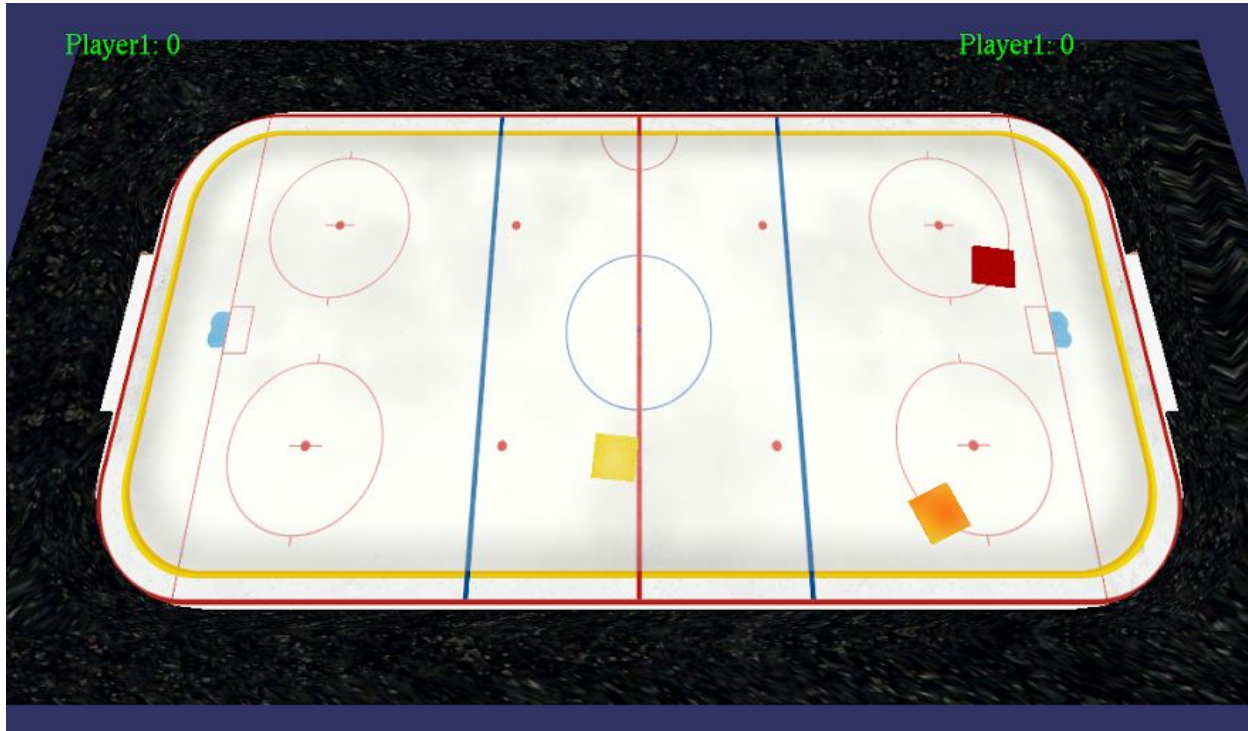


Figure 3: The square pucks and paddles change the way the collisions work adding an interesting twist to the game.

Issues We Encountered

Triangle Mesh Shape

When using Bullet, we wanted more complex shapes for our collisions so we moved beyond the simple shapes that Bullet has optimized. However, when we used the triangle mesh shape for our table, it caused some hiccups. When the puck or the paddle would move over some of the edges of the triangles making up the table, it would cause a collision and its course would be altered. For an air hockey table, this was not acceptable. In order to solve this problem, we switched out the triangle mesh for just a regular box shape and then the puck and paddles were able to move smoothly.

Accurate Physics

To make a realistic Air Hockey game, we needed realistic physics. This was tricky for the puck because it needs to be able to slide around the table and bounce off the walls but not be too bouncy such that it starts bouncing on the table and flies off. We had to experiment with a variety of settings such as changing the puck's mass, friction, restitution, and inertia. After trying out multiple configurations, we found one that behaved realistically which we then used for our final product.

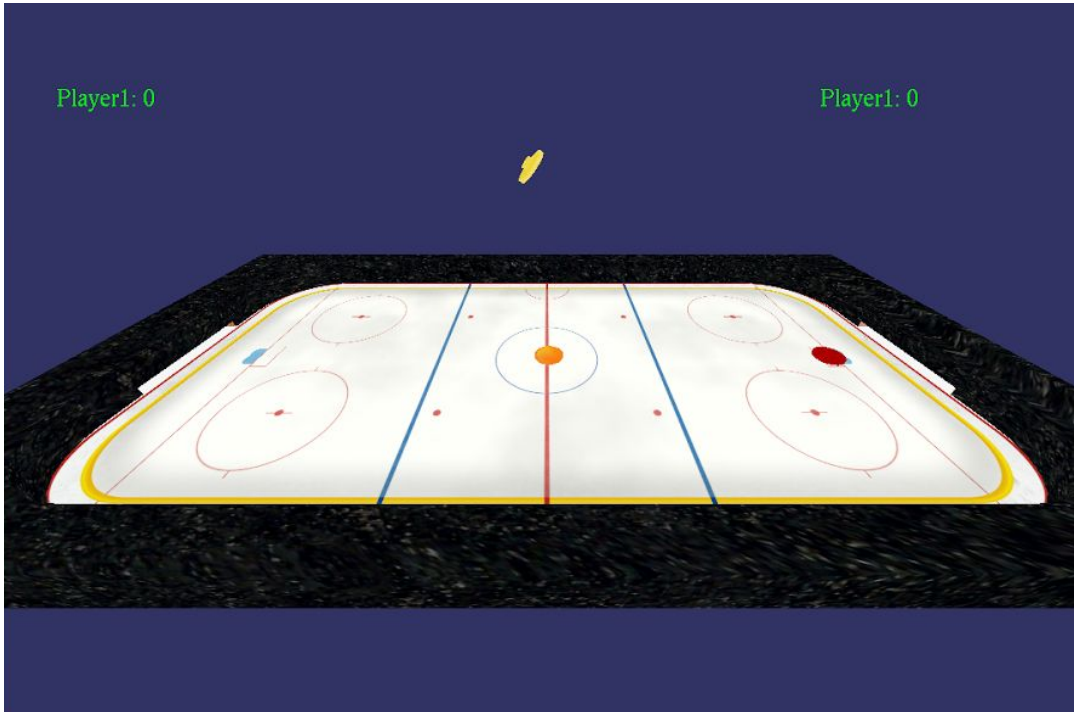


Figure 4: We needed realistic physics so objects would not arbitrarily fly off the table.

Official Air Hockey Rules

Source: <http://www.airhockeyworld.com/usaarules.asp>

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SECTION I. Basic Rules of Play

1. The first player to accumulate seven (7) points wins the game.
2. When the puck enters and drops inside a player's goal, the player's opponent receives one point (unless play had been suspended by the referee or the offensive player had committed a foul during or prior to the shot.)
3. After each game, players will alternate tablesides.
4. The player scored upon receives possession of the puck for the next serve.
5. A player may hand serve the puck only after it has entered his goal.
6. A player may play with only one mallet on the playing surface at one time. Violation results in a foul.
7. The puck may be struck with any part of the mallet.
8. The puck cannot be "topped" by lifting the mallet and placing it on the top of the puck. This cannot be done at any time whether before a serve or after a serve during play. Violation constitutes a foul. Using the mallet to bring an airborne puck to the table or opponent's goal is not a topping violation no matter which side or edge of the puck is contacted.
9. Only one puck may be in play at a given moment.
10. A player has seven (7) seconds to execute a shot, which crosses the centerline. The seven (7) seconds begins as soon as the puck enters and remains on that player's side of the centerline. Violation of this rule is a foul.
11. When the puck is in contact with any part of the centerline, either player may strike the puck.
12. A player may stand anywhere around the table on his/her side of the centerline. He/she may not stand past that line.
13. If any part of a player's hand, arm, body, or clothes touches the puck, "palming" will be called by the referee, which constitutes a foul.
14. Each player may take one time-out per game. The time-out may be no longer than 10 seconds.

15. A player may exercise his/her time-out only when the puck is in his/her possession or not in play.
16. A player must make a clear indication of time-out so that the referee understands the player's intention.
17. When a player is scored upon, he/she will have ten seconds to remove the puck from the goal and place it in play. The ten seconds start as soon as the puck has fallen completely through the goal and is available for the player to place into play. This rule is suspended during the course of a time-out.

SECTION II. Legal Objects

A. Sanctioned Tables

1. All sanctioned tables must meet USAA standards.

a. List of Approved Tables (full-size models)

Brunswick Blue Top
Dynamo Brown Top
Dynamo Blue Top
Dynamo Purple Top
Dynamo Photon (Ice-Blue Top) w/ thin centerline
Dynamo Pro-Style
Dynamo Best Shot
Gold Standard Games Tournament Pro
Gold Standard Games Professional
Gold Standard Games Tournament Pro Elite (sanctioned under white light)
Gold Standard Games Elite (sanctioned under white light)
Gold Standard Games Premium (sanctioned under white light)
Gold Standard Games Gold Flare (sanctioned under white light)

b. Tables must be broken-in.

2. "Conditional Approval" may be granted on a situational basis by the USAA Board of Directors. This means that both players must agree to play on the table.
3. Tables with a long overhead light are not sanctioned for tournament use.

B. Mallets

1. Mallets (strikers) must be approved by game referees as meeting the requirements of the USAA. USAA requirements are as follows:

Weight must be 6 oz. or less.

Diameter must be less than 4-1/16".

Color may be any except that the outside rim must be of a different color than game surface of table.

The mallet must consist of the same material and be uniform and symmetrical throughout its circumference.

2. No mallet may be altered by sloping the playing surface in order to create an angled striking or defending surface.

C. Pucks

1. Three pucks are approved by the USAA for sanctioned events: The "lexan-yellow", the "lexan-red" and the "Dynamo green". The "lexan-yellow" will be used unless both players agree to use another puck.
2. Pucks may not be changed during a game unless both players agree or unless the referee insists due to clear non-playability of the puck. Such a change in pucks must, if possible, be to the same kind of puck.
3. Pucks must have at least one layer of white plastic tape on the top side. Pucks with more than one layer of tape may be used only if both players agree.

D. Other Objects

1. Shields are approved for play if they are at a right angle to the top of the table and both players agree to play with them.
2. Devices for attaching mallet to hand (i.e. bands, straps, strings, handles, and/or gloves) are legal as long as they do not affect the puck during play.

SECTION III. Beginning the Game

1. Every official match begins with a face-off. A coin toss is first used to determine starting sides. The player winning the coin toss chooses which side to begin on. The winner of the face-off will begin games 3, 5 and 7 with the puck. His opponent will begin the games 2, 4 and 6 with the puck.

2. A face-off is when the puck is placed flat on the center of the table by the referee with the players allowed to advance to within one inch of the puck. A player's mallet may not touch the centerline until the referee releases the puck, at which time normal centerline rules will be in effect.

Once both players are positioned, the referee will call "players ready" then wait 1, 2, 3, or 4 seconds before releasing the puck. When the referee releases the puck, the players may go for it.

The referee should make a determined effort to release the puck without causing any motion to it. If the puck attains excessive motion, the referee may declare the face-off null and redo it. If the puck goes off the table, the face-off is repeated.

If either player contacts the puck before the referee releases it then a false start has been committed. Each player is allowed one false start with no penalty. If a second false start is committed then the innocent player receives possession.

3. The following constitute winning a face-off: A score on the opponent or gaining the first clear possession without fouling. A puck that has not yet left the centerline cannot constitute possession for either player.

4. During any face-off at center of the table, the centerline rules are still in effect.

5. Every game after the first begins when the referee calls "in play" after ascertaining that both players are ready. In case of any excessive delay by either player to give an affirmative indication of their readiness, the referee will proceed to call "in play".

SECTION IV. In Play vs. Out of Play

1. The legal bounds of play are the table's playing surface, the walls of the rails, the front faces of the goals, the interiors of the goals, and the player's mallets. If the puck touches any other object(s) while it is in play, whether by interference or by foul (unless the foul is nullified) it is considered out of bounds and therefore instantly out of play.

2. A puck, which grazes the top of the rail, is out of play even if it returns to the table surface. If the puck bounces off a shield and returns to the table, the puck is out of play.

3. When the puck is in play, the referee should only grant a time-out if the player calling time-out demonstrates control of the puck. A puck breaking the vertical plane of the goal face can never be considered controlled. A player must never assume that the referee has granted a time-out and should therefore stay at the ready until the referee officially calls time-out.

4. A player calling an additional time-out after his first receives an automatic conduct warning from the referee. The referee should announce "time-out," issue the warning by announcing, "conduct warning - extra time-out," and immediately call "time-in." If the non-offending player was not in possession of the puck, the referee should ask that player if he/she is ready before announcing "time-in." A referee may suspend this penalty if the offending player attempts to call an extra time-out because of injury.

5. If interference occurs during a shot which scores and interference is called by referee, the point does not count. Interference is defined as foreign objects on the table or playing surface, obvious unnecessary noise or distractions or

actions by spectators that cause distractions to any or all players, and/or any other incident so deemed by referee. The puck returns to the player who possessed it prior to the interference.

6. When the puck leaves the playing surface and contacts anything except a player's mallet, play is suspended until the puck is put back into play by the referee. True, even if it touches top of flat rail surface.

SECTION V. Scoring

1. If the puck stops in the goal yet has tilted and broken the horizontal plane of the goal then a score has occurred. If a puck stops in the goal and does not tilt, thereby not breaking the horizontal plane, then the player may either hand the puck to the other player or try to work the puck out of the goal using legal play methods.

2. If the puck rebounds out of the goal mouth, the point does not count. A puck which rebounds out of the goal mouth and strikes the defending player's hand, and rebounds back into the goal does count.

3. If a puck hits a player's hand on its way into the goal, the point counts as long as the puck would have scored without the contact.

4. If a score occurs after the table loses power, the point will count only if the puck was struck prior to the table losing power.

5. If a player takes a shot and drops his mallet and the puck enters his/her own goal for a score without it being deflected by the defensive player, the point counts. The player is permitted to stop the puck with hands or body. No point would be scored if the puck enters the opponent's goal due to the distraction. If a player shoots and the defense loses the mallet, the defense may not use hands or body to stop the shot if the shot occurred prior to or simultaneously with the losing of the mallet. The point counts if it scores.

6. If a player commits a foul and is scored upon in the course of the same play the goal counts and the penalty is nullified.

SECTION VI. Penalties & Fouls

1. Foul: The penalty for a foul is forfeiture of the puck.

2. Technical Foul: The penalty for a technical foul is a free shot taken by the innocent player at the unprotected goal of the guilty player. After a free shot, play immediately begins when the puck either scores, rebounds from the goal, touches the opponent's end of the table (not sides), or comes to a rest on the playing surface. All free shots must be legal.

3. Unnecessary or excessive delay of game is considered a foul and loss of puck results. Stalling is included in this ruling of delay (referee decision).

4. If the puck rises from the table and touches the defensive player's hand(s) or arm(s), no foul need be called.

5. If an offensive player hits a puck and the puck wobbles, hitting the hand of the defensive player, but not changing the perceived speed and direction of the puck, then no foul occurs.

6. "Goal-Tending": If "palming" occurs while the puck is moving in a direct path towards the goal for a score, "goal-tending" must be called against the player doing the "palming." "Goal-tending" incurs a technical foul.

7. When a player loses total control of his own mallet (with or without a string attached) while the puck is in play the player commits a foul.

8. When the puck is struck in an offensive manner, leaves the playing surface, and remains off the table, the player causing such action commits a foul.

9. Any player violating a centerline rule commits a foul.

10. Distractive Noise: Talking to an opponent, a spectator, a referee, or oneself during play may be penalized by a foul. Loud noises and excessive screaming can also be considered distracting. A referee may warn a player before calling a foul at his/her discretion. Intentional or excessive, distractive talking may be penalized by a "conduct warning" in addition to a foul. Possible distraction violations, which directly lead to a score or a change of possession, should be scrutinized more seriously by a referee when determining whether to ignore, warn or penalize the potential violation.

11. If the puck and mallet of the offensive player are both completely on the offensive player's side, the defensive player may not strike either the puck or mallet. Also, the offensive player may not strike the defensive player's mallet in this situation when the defensive player's mallet is completely on his own side. Violation of this rule constitutes a foul.

12. If in the course of hitting the puck legally, a player's mallet extends partially (but not completely) over the centerline, no foul shall be called if his mallet contacts the opposing player's mallet.

13. Although a mallet is allowed to overreach the centerline, the mallet may never completely extend over the centerline -- even when following through on a shot. The mallet may never extend further than its diameter across the centerline. Violation of this rule constitutes a foul.

14. Any player who, on his hand serve, makes a score in his opponent's goal without there having been an offensive shot made on the puck, since the time that the puck was in play, commits the foul of tossed score. In other words, a player cannot just toss the puck into the opponent's goal. The illegal score shall not create a point, and the player who was illegally scored upon shall have the right to hand serve as the penalty imposed upon the fouling player.

15. If the defensive player strikes the puck in an offensive manner (with forward momentum) and causes the puck to leave the playing surface, this constitutes "charging the puck". The offensive player retains possession of the puck. Conversely, a defensive player who "blocks" by holding steady or by striking the puck sideways or backwards, causing the puck to leave the table, should not be charged with "charging."

16. If the referee decides that excessive force was used by the defensive player in knocking the puck off the table, the player commits a foul.

SECTION VII. Player Conduct

1. UNSPORTSMANLIKE CONDUCT WARNING: A foul is incurred upon the second conduct warning received in a match. A technical foul is incurred upon the third conduct warning received in a match. A fourth conduct warning results in forfeiture of the current game. A fifth conduct warning results in forfeiture of the match. A referee issues the conduct warnings immediately but must wait until after the game to record the details on the back of the match card. Actions that should receive "conduct warnings" include, but are not limited to:

- a. Excessive or abusive arguing with the referee
- b. Cursing directed towards the referee
- c. Speaking loud and vulgar obscenities
- d. Verbal or physical assault of another player, spectator, or referee
- e. Actions that endanger spectators
- f. Destruction of property
- g. Actions that discredit the sport, as decided on by the USAA Board
- h. Taunting of another player (includes but not limited to: cursing your opponent, verbally defaming them, or making obscene gestures)
- i. Intentional or excessive distracting noise

2. If a referee feels a player has committed extreme unsportsmanlike conduct, the referee may issue multiple "conduct warnings" for one single action. A referee may issue enough "conduct warnings" to cause a forfeiture of a game or match immediately if he/she feels the penalty is warranted.

SECTION VIII. Player Rights

1. Players of a Challenge Match may play without a referee at their own risk of irreconcilable controversies.
2. Before competition begins, a player has the right to play under the stipulation that no special time-outs for the purpose of clearing sweat from the table be called. Unless a player requests this stipulation from the referee either player may request the referee to clean the table during a game.
3. If a referee coaches a player or engages in any questionable behavior, the opposing player may protest to a Head Referee or ultimately to the Tournament Committee for a decision.
4. An appeal may be made from either player not in agreement with the referee's decision. However, the appeals from an Official Air-Hockey Competition and a Challenge Match go to different bodies.
 - a. The appeal goes to the Head Referees in an Official Air-Hockey Competition. The Head Referees may overturn the original referee's decision only if the matter is an incorrect understanding of the rules. After the correct rule is understood, the original referee's interpretation of the evidence according to the rules is final. The appeal in this situation must be made immediately after the occurrence or after the end of the game in which the disagreement took place. When the next game is begun, no appeal may be made.
 - b. The appeal goes to the USAA Board of Directors after a challenge match. These directors decide whether the appeal is valid and, if so, have the right to make any decisions they deem necessary.
5. If a player desires spectators or players to be quieter while he/she is playing, he/she should ask the referee to request quiet from the crowd. If the referee does not believe the noise to be unusual, then the referee does not have to request the quiet. The player desiring quiet must not abuse the crowd.
6. During a challenge match players have a maximum of one minute in between games, however either player may choose to take one 2 minute break in between games each set. This may be extended in emergencies.
7. A player is allowed to change mallets at any time during play.
8. If a puck is flipping around on its edge on one player's side of the table, then the player may wait for it to stop.

SECTION IX. Referee Authority & Responsibilities

1. Each game in a USAA Sanctioned Air Hockey Tournament shall be refereed. The referee will act as an unbiased observer insuring that the game is played in a correct, fair, and sportsmanlike manner.
2. The referee has the authority to declare "in play", "time-in", or "time-out". He/she also has the power to impose penalties and enforce all the rules of the sport.
3. The referee must never coach a player whom he/she is refereeing.
4. The referee will signal with his arm in the direction of the player who won the face-off.
5. When the game is out of play as a result of a foul the referee will ask the player not in possession of the puck if that player is ready before the referee announces "in play" (or "time-in"). In case of any excessive delay by the player not in possession of the puck to give an affirmative indication to the referee that he/she is ready, the referee may proceed to put puck in play. The referee must place a puck that is off the table back into play by either physically releasing it or by acknowledging the release of the player.
6. The referee has the final word on any decision during the game that is in adherence to the rules. He/she may consult others if he/she wishes to do so.

7. Referee may call an official time-out of a reasonable duration if he agrees that the situation warrants it (i.e. sanding the puck, interference, emergencies).

8. Referees should caution players to desist from striking pucks that are obviously spinning top-like on the table. A foul may be called. Such pucks may be kept on the table by use of the mallet.

9. If a referee doesn't suspend play immediately after a foul, but his/her voice or gesture interferes with continued play to the point of distraction, the puck should be returned to the player not committing the foul. A player must never assume that a foul will be called and stop his/her play. The puck remains in play until the referee suspends play and then decides the nature of the foul and the moment of play in which it occurred.

10. If a puck is flipping around on its edge on one player's side of the table, then the referee will suspend the seven-second rule until the puck rests flat.

11. Lifting the mallet from the table and striking the puck is legal. However, if the referee can show clear damage to the table, the player causing such damage to the table must cease use of whatever method of play causes it. The referee may also at any time disallow a technique that he/she deems destructive to property or dangerous to players and/or spectators.

12. The referee shall verbally state the score of the game after each point is scored. He/she shall also verbally declare the game count of the set after each game is completed, and set count after each set, if applicable.

13. If a foul occurs and the innocent player plays the puck before the referee has time to suspend play and grant him possession of the puck, the referee may choose not to call the foul.

14. The referee should caution players not to tilt their mallets so as to descend past a 40-degree angle when touching the puck with the mallet. Otherwise, their action can be considered "topping" the puck, which incurs the penalty of a foul.

15. In the case of a centerline or topping violation, the referee shall not stop play if the innocent player gains immediate possession of the puck.

SECTION X. Tournament Procedures

1. Players have a maximum of two minutes in between games during a tournament match. This may be extended in emergencies.

2. Players may take a maximum 15-minute break between sets during a tournament or challenge match. This may be extended due to emergencies.

3. When a match is called, both players have 15 minutes to report to the referee or the tournament director. The clock begins when the match is called and does not stop ticking until both players report. If there is not a response within 10 minutes, then the next match is called. For a player who has not reported by 15 minutes, one point is lost, and then one additional point for each minute afterwards. This will continue until the player finally reports to the referee or the tournament director. Any penalties assessed by this rule are mandatory and are NOT up to the discretion of the offending player's opponent.

4. If a player has been informed personally that his match is up for play, the player has five minutes to report to the table for competition. If the player does not comply by the end of five minutes, he loses one point per game and then one point per game per minute thereafter.

5. Players who do not referee a match that they are responsible to referee, or who do not provide a referee acceptable to the players when the players are ready, face the possible penalty of conduct warnings and/or more severe penalties at the discretion of the tournament committee. The referee does have a maximum 5-minute break if he/she has just finished competing.

6. During later matches on the last day of a tournament, players are granted permission to watch three games of an ongoing match, even if the time for their match has come.

7. Players must inform either of the two Head Referees if the players are leaving the tournament premises. Players should provide specific information as to their whereabouts and length of absence. If Head Referees are unavailable, chart personnel must be consulted.

8. Players who voluntarily forfeit out of a tournament are not entitled to their prize money or prizes. The USAA may make exceptions to this rule in extreme cases. The unclaimed prizes return to the tournament sponsors.

9. The USAA reserves the right to photograph or videotape any tournament play desired by the camera crew and to use it as players request. Players may refuse to permit flashbulbs or extreme lighting to be used during their match by camera people.

10. The USAA and tournament sponsors are not responsible in any way for loss resulting from injury during or traveling to and from any of its sanctioned events. Each participant and spectator assumes full and total responsibility for health and safety and agrees that the USAA and its sponsors are held harmless.

11. During a USAA Swiss event, once a match is officially called and time is written on the match card by the current chart keeper in charge, players have five (5) minutes to get to their match table. After five (5) minutes, they lose a game. Thereafter, they lose a game for each five (5) minutes. Example: if a player shows up nine (9) minutes late they have lost one game and may begin play.

12. Sanctioning of USAA National/International Tournaments requires a majority vote of the USAA Board.