Basic features & Functions of TW-2700-S9 Table Tennis Serving Robot

The robot is of double machine heads and double spinning structures. It is of powerful functions and advanced program-controlled system, capable of services of topspin and bottom spin, self-program function, serving modes of single or compound programs as well as intelligent control serving modes.

Eight serving modes:

1. Regular mode

Machine Head A or B can be chosen to delivery the ball to one of the 9 horizontally sequenced landing points.

2. Random serving mode

a. Random serving from Machine Head A or B to the 9 horizontally sequenced landing points on the entire court;
b. Random serving from Machine Head A or B to the 5 horizontally sequenced landing points on the left-half court;
c. Random serving from Machine Head A or B to the 5 horizontally sequenced landing points on the right-half court;

3. A+B random serving mode

a. Random serving from Machine Head A and B to the 9 horizontally sequenced landing points on the entire court;
b. Random serving from Machine Head A and B to the 5 horizontally sequenced landing points on the left-half court;
c. Random serving from Machine Head A and B to the 5 horizontally sequenced landing points on the right-half court;

Note: under this serving mode, different spins and curves have been pre-set for both Machine Head A and B, which enables landing points on both right and left side, long and short ranges and different intensities of spins.

4. Intelligent control serving mode

The random changes of all parameters of this intelligent control enables a choice of Machine Head A or B, topspin or bottom spin, the intensity of spins (ball intensity), ball curves (long or short ranges), ball frequencies and landing points (the entire court/left-side court/right-side court).

5. Inbuilt single program serving mode

One of the five inbuilt programs can be chosen to deliver the balls.

6. Inbuilt compound program serving mode

Two to five inbuilt programs can be chosen to deliver the balls.

7. Single self program serving mode

One of the five self programs can be chosen to deliver balls.

8. Compound self program serving mode

Two to five of the five self programs can be chosen to deliver the balls.

Six Functions

1. Topspin and bottom spin

Set topspin for Machine Head A and bottom spin for Machine Head B and services of topspin and bottom spin can be generated accordingly.

2. Self program (compound serving)

According to personal training needs, it is possible to edit a program which defines topspin, bottom spin, revolving intensity, delivery sequence and landing points of Machine Head A and B. The program can be stored for future use.

3. Long and short ranges

The ball curves from Machine Head A and B can be adjusted to decide the different ranges.

4. Memory function

Topspin, bottom spin, revolving intensity, ball curves, landing point and other functional data can be automatically memorized and stored before shut down.

5. Timing/Counting function

The user can decide and set time and number data, which are digitally displayed. The robot automatically stops when the set time or count is reached.

6. Factory reset

All the parameters from the factory can be restored.

18 landing points

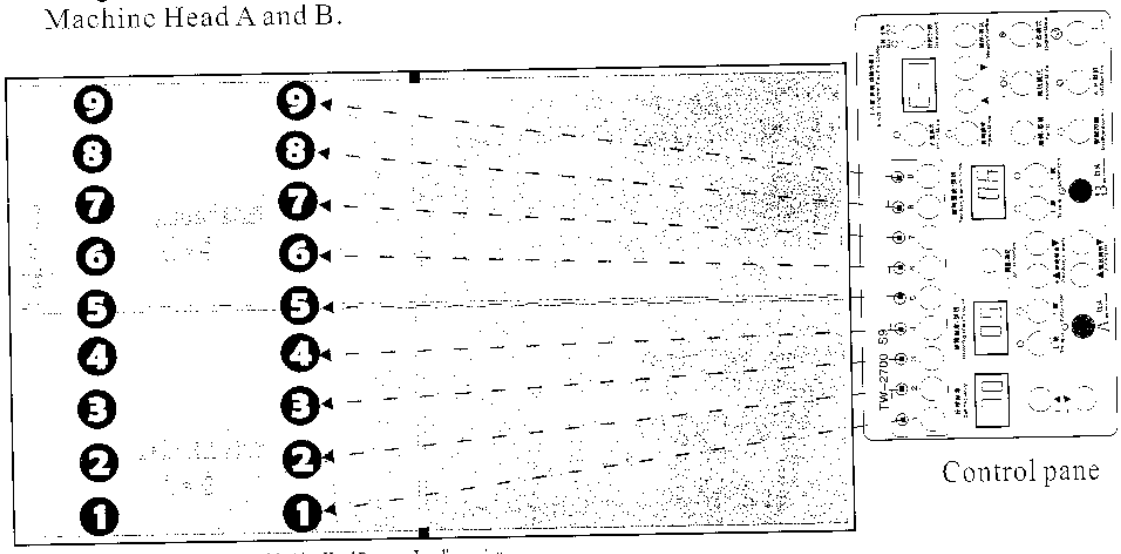
Landing point 1~9 for Machine Head A
Landing point 1~9 for Machine Head B

9 spin modes

Topspin, bottom spin, left-side spin, left-side topspin, left-side bottom spin, right-side spin, right-side topspin, right-side bottom spin and without spin (straight)

Settings of topspin, bottom spin and landing points for A+ B heads

1. It is recommended to set topspin for Machine Head A and bottom spin for Machine Head B, in order to avoid inaccuracy of landing points caused by the shifts of serving modes or programs.
2. Long and short ranges can be achieved by adjusting the different curves of Machine Head A and B.



Control pane

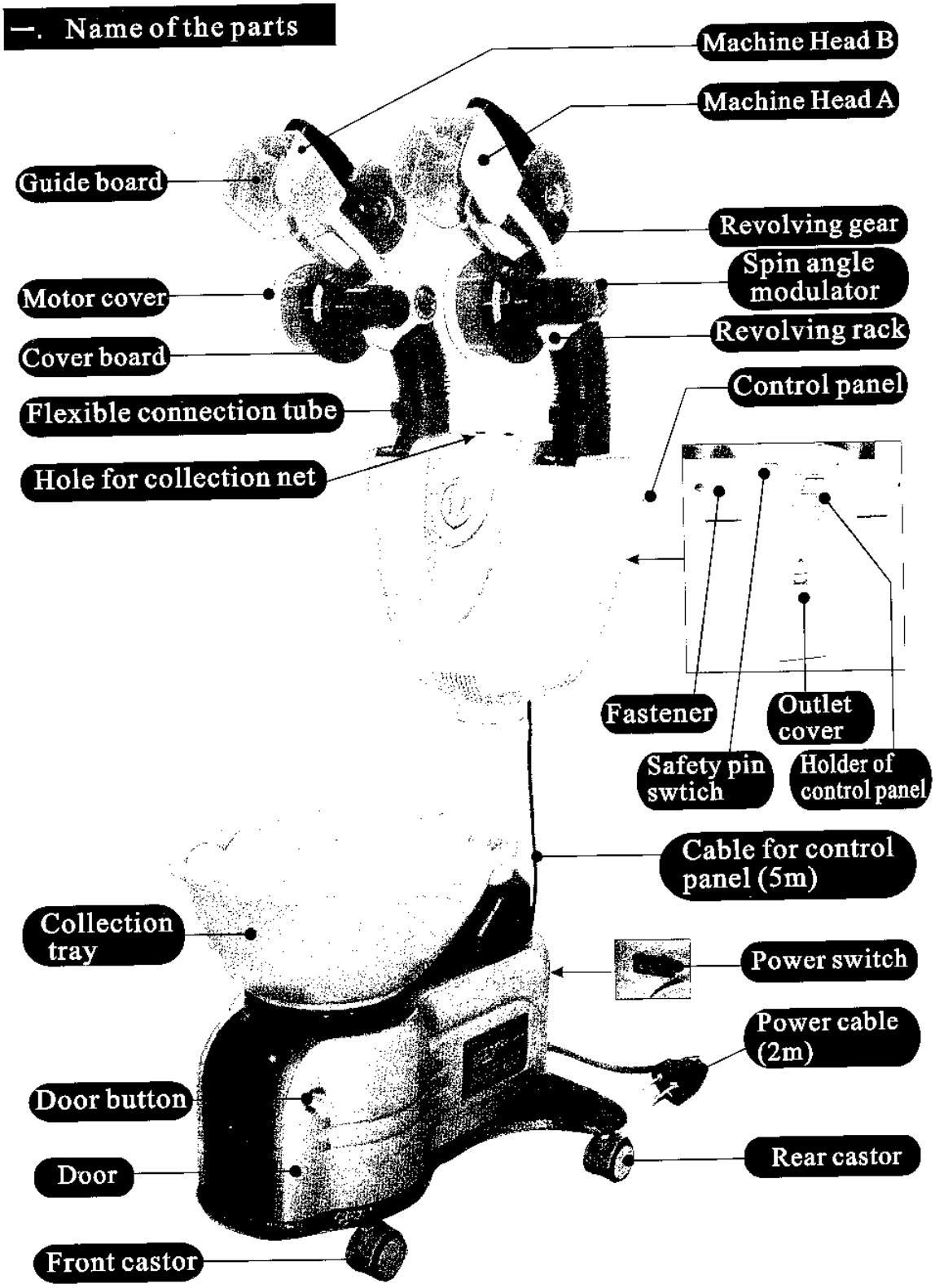
Table tennis court

Factory Reset/Recommended Parameters

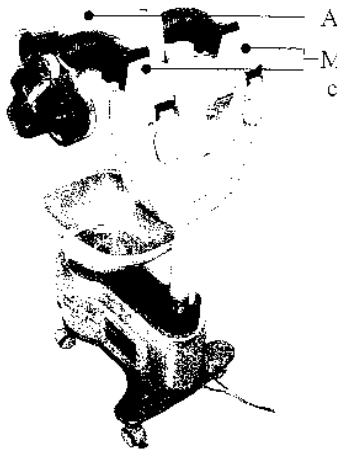
Spin modes		Machine Head A (Topspin) Revolving Intensity	Machine Head B (Bottom Spin) Revolving Intensity	Ball Frequency	Arc
Factory Reset		6	6	45	16~20
Recommended Parameters	Straight	5	/	45~70	16~20
	Topspin	6~11	/	45~70	18~22
	Bottom Spin	/	6~9	40~55	28~33
	A+B Random	6~11	6~9	45~60	
	Intelligent Control	6~11	6~9	45~60	
	Left- and right-side Topspin	5~11	/	45~70	
	Left- and right-sideBottom spin	/	6~9	40~55	

Notice: please set the operational parameters according to *Factory Reset* before initial start-up. Press the *On/Off* button to power on and practice. The user can adjust revolving intensity, curve and ball frequency according to his skill levels

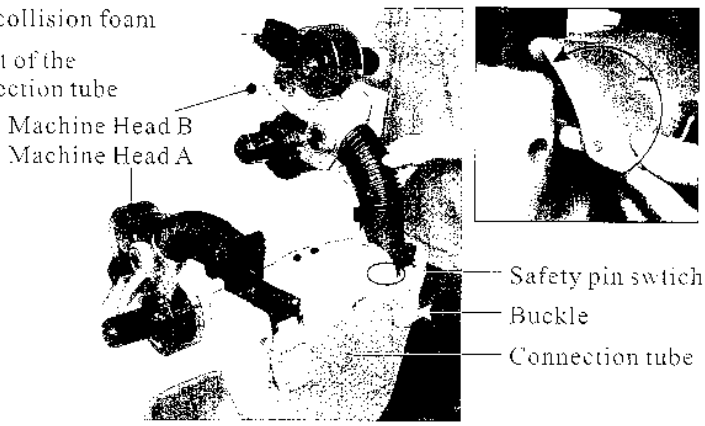
一. Name of the parts



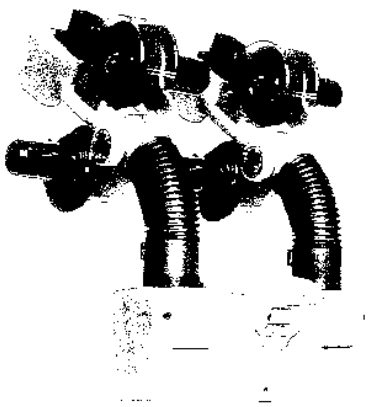
二. Installation



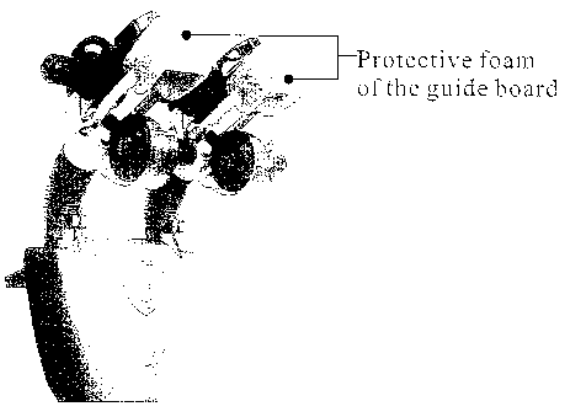
1.Unwrap the carton, remove the cushioning foam and place the robot gently on the ground. Take out the transparent plastic bag, anti-collision foam and mount of the connection tube.



2.Hold up Machine Head B to its installation location, where the safety pin automatically locks with a sound (Withdraw slowly and make sure it is properly locked). Then press the lock against the connection tube and have the machine head fastened.

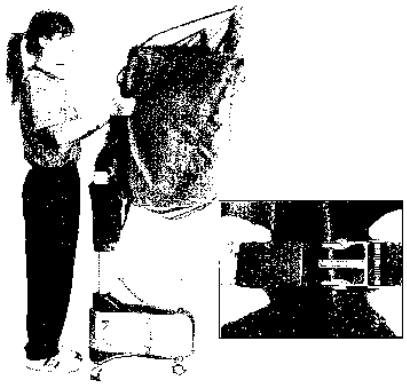


3.Please refer to the installation of Machine Head B above for A.

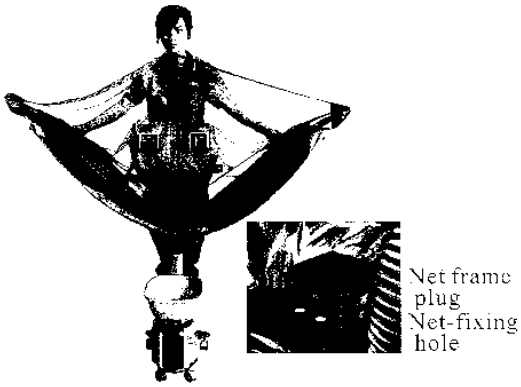


4.Take the two protection plates of the guide boards out and the installation is finished.

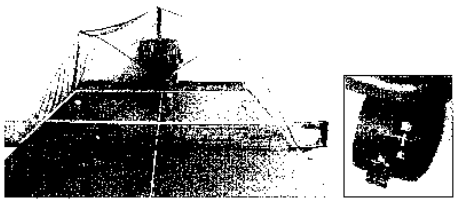
三. How to use the collection net



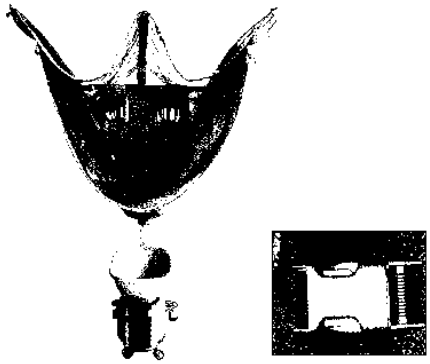
1.Unfasten the buckle of the collection net.



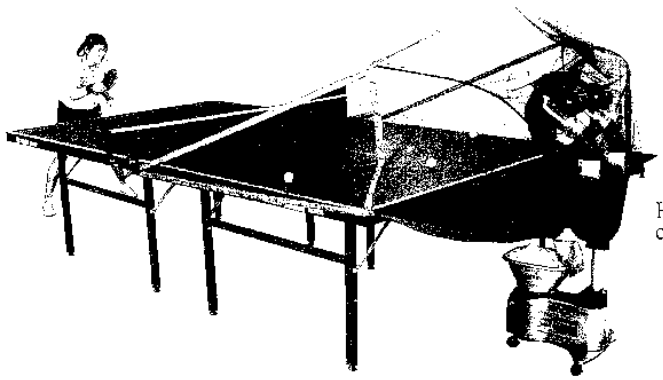
2.Unfold the collection net slightly. Insert the robot machine heads into the two holes of the net and then insert the collection net into the jack of the robot.



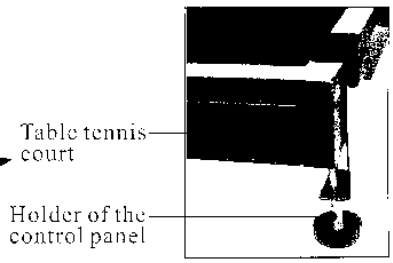
3.Move and place the robot to the court edge properly, turn off the lock of the casters and fasten the rubber bands to the net poles of the court.



4.Soon as the training is finished, fold the collection net conversely, lock the buckle properly and put it away.

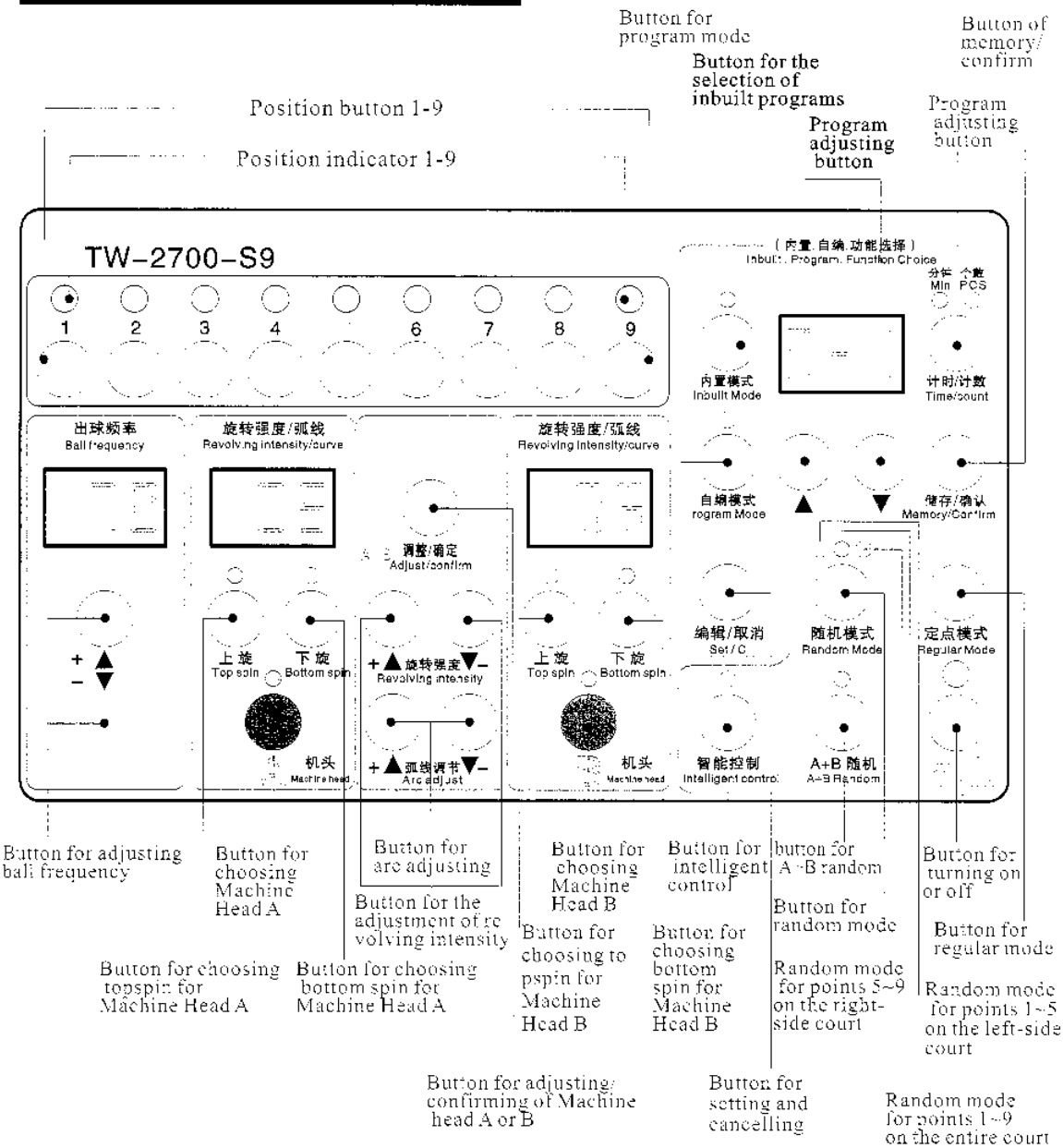


Installed representation



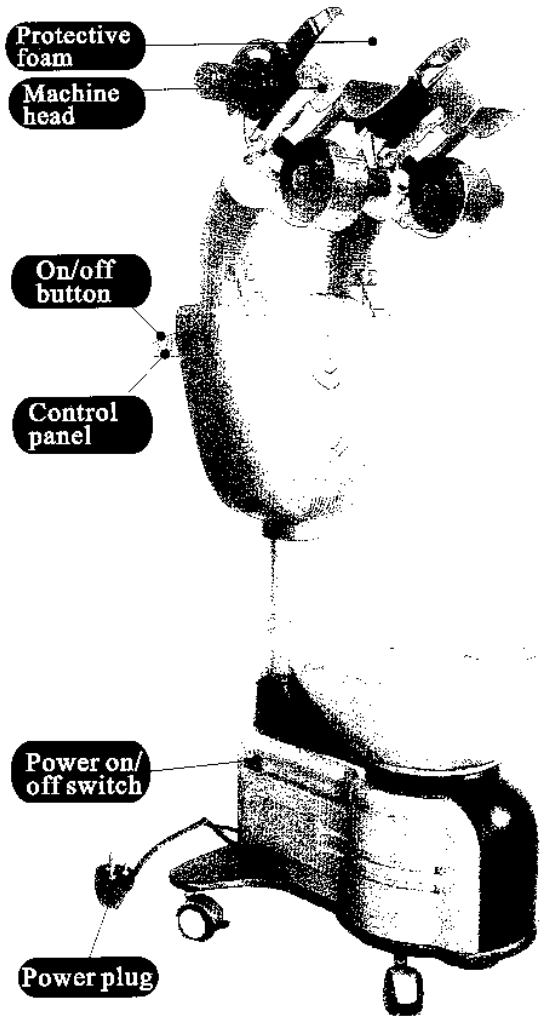
★ The holder of the control panel can be at any position along the court edge. It is easier to operate when the control panel is mounted on the holder.

四. Functions of the control panel



五. Start and Stop

Reminder Please take out all Protective foam from the guide boards in the machine heads before initial operation

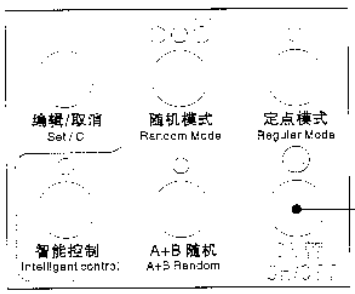


1 Plug in the power plug, turn on the Power on/off switch and the power on/off indicator lights up.

2 Once power on, the on/off indicator on the control panel lights up in red. All selected mode and position indicators lights up too. Please set the parameters according to Factory Reset and recommended parameters before initial operation. When the parameters are properly set, press the **on/off** button on the control panel again and the indicator turns into green, which means the robot is ready for services.

Factory Reset	Spin Mode	Machine Head A (topspin) Revolving intensity	Machine Head B (bottom spin) Revolving intensity	Ball frequency
	Topspin	6	6	45

3 Press the **on/off** button again and it turns in red again as the robot stops.



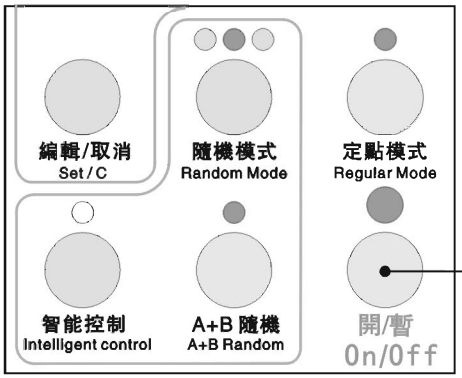
Control panel (Segment)

Caution

Do not get close to the ball outlet of the machine heads when the robot is in services or it may hurt.

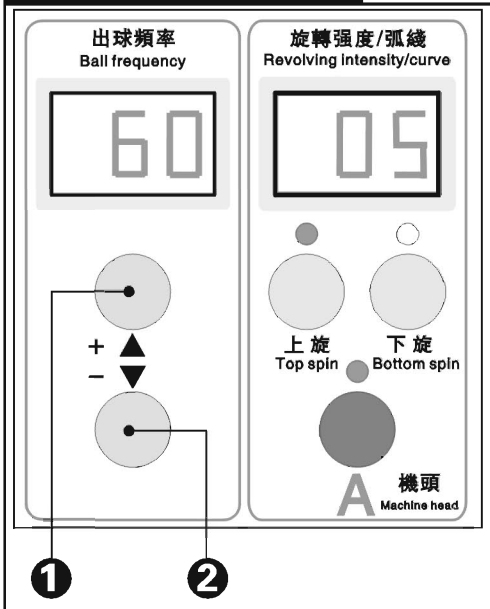
六. Procedure for serving modes

(1) On/Off button



Press the button once and the robot starts to serve as the indicator changes from red to green. Press the button once more and the robot stops serving as the indicator shifts back from green to red.

(2) Ball frequency



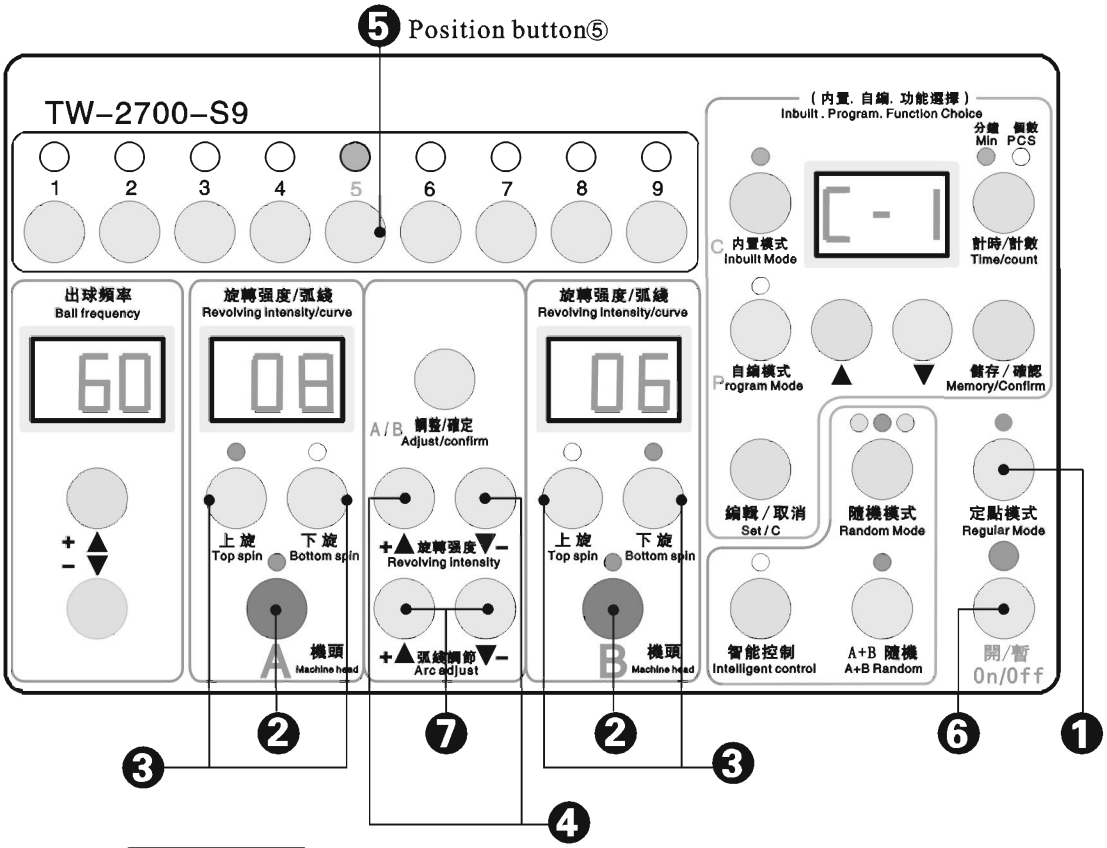
1. Press + button once and the frequency is increased by 1 ball and digitally displayed. Press + without release and frequency increase (pcs/min) speeds up.
2. Press − button once and the frequency is decreased by 1 ball and digitally displayed. Press − without release and frequency decrease (pcs/min) speeds up.

Notes

1. Ball frequency ranges from 30~100 pcs/min.
2. Ball frequency can be adjusted under the status of both operation and pause.

Reminder	Under each serving mode, the ball frequency of Machine Head B, for which bottom spin is set, is lower than that of Machine Head A, for which topspin is set.

(3) Procedure for Serving Modes



❶ Press **Regular mode** button and its indicator lights up.

❷ Press **A** or **B** and the corresponding indicator lights up.

❸ Press **Topspin** or **Bottom spin** to choose spin modes and the corresponding indicator lights up, red for A and Green for B. The revolving intensity is display on the digital screen.

❹ Press Revolving Intensity **+▲** or **▼−** button to adjust the revolving intensity. Revolving intensity can increase from 01 to 15. For each press, the intensity is increased or decreased by 1 score.

❺ Press **Position 5** to choose landing point and the corresponding indicator lights up.

❻ Press **On/Off button** and the robot start to serve. Watch the arcs and landing points.

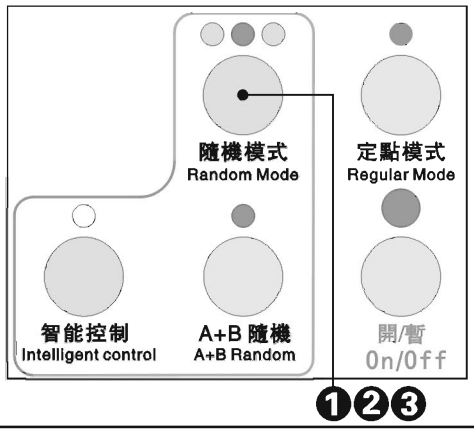
❼ Press **Arc Adjus +▲** or **▼−** button to adjust ball curve and landing points. The arc can increase from 0 to 50. For one press, the number increases or decreases by 1 score. Press without release and the adjustment speeds up. (As the arc increases in number, the landing point moves outwardly along the court.)

It is advised to set the revolving intensity before arc because the revolving intensity impacts on ball curve.

Up to now, the setting and adjusting of spins, revolving intensity and arc has been finished for one machine head. Repeat the steps of ❷, ❸, ❹, ❺, ❻ and ❼ for the other.

Reminder	It is recommended to set topspin for Machine Head A and bottom spin for Machine Head B, in order to avoid inaccuracy of landing points caused by the shifts of serving modes or programs.

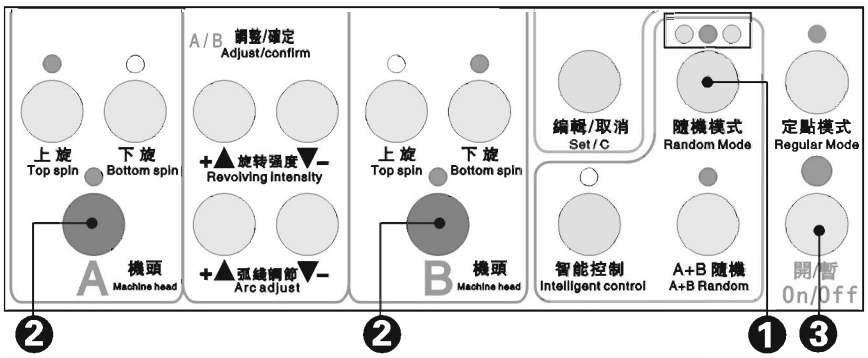
(4) Procedure for random serving mode



Please set topspin, bottom spin, revolving intensity and ball arc accordingly before use.

4-1 Use of Random Mode button (recycling display)

1. Press **Random Mode** button and the central indicator turns in green, which means random mode has been applied for Point 1 to 9 on the entire court.
2. Press **Random Mode** button again and the right indicator lights up in red, which means random mode has been applied for Point 5 to 9 on right-half court.
3. Press **Random Mode** button for the third time and the left indicator lights up in red, which means random mode has been applied for Point 1 to 5 on left-half court.



Random mode indicators

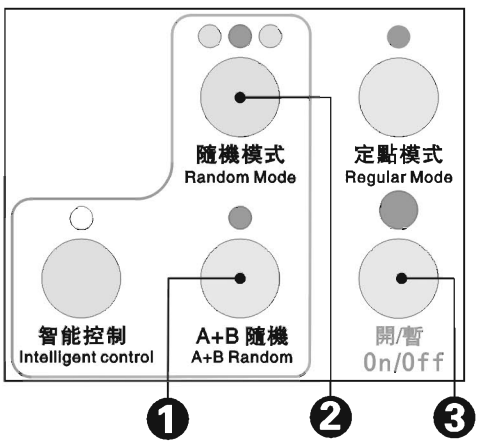
Each time the **Random Mode** button is pressed, the indicators shift in a sequence as bellow:

Entire court (Central indicator) → Right-half court (Right indicator) → Left-half court (Left indicator) →

4–2. Procedure for A/B random serving mode

1. Press **Random Mode button** and choose the landing scopes of Entire court, Right-half court or Left-half court and the corresponding indicator lights up.
2. Press **Machine Head A** or **Machine Head B** to select Machine Head And the corresponding indicator lights up.
3. Press **On/Off button** and random serving mode is applied for Machine Head A or B in the chosen landing scope of either Entire court, Right-half court or Left-half court.

(5) Procedure for A+B random serving mode

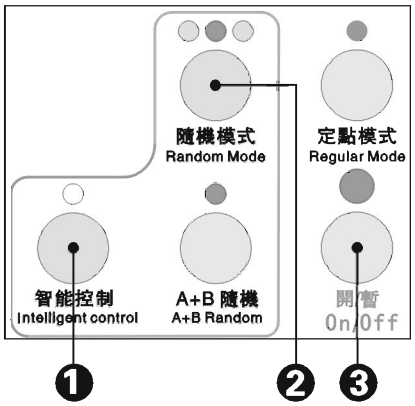


Before this mode is applied, please set topspin for Machine Head A and bottom spin for B, revolving intensity and ball arc accordingly under regular mode so that there can be of different landing points, ranges, topspin and bottom spin.

1. Press **A+B Random button** and the corresponding indicator lights up. The central indicator of random mode turns in green, which means A+B random serving mode has been applied for point 1 to 9 on the entire court.
2. If A+B random serving mode is required on the right-half or left-half of the court, press **Random Mode button** and the corresponding indicator lights up in red.
3. Press **On/Off button** and the set A+B random serving mode is applied for the entire court (or right-half/left-half court).

Reminder	1. Press A+B Random button, the indicator will be off and the serving mode changes to random mode. 2. In case of need, the revolving intensity or ball curve can be adjusted while in services by pressing Adjust/Confirm button.(Please refer to the procedure of *Adjust/Confirm* on page 9.)

(6) Procedure for A+B intelligent control serving mode



Before application of this mode, please set topspin for Machine Head A and bottom spin for B, revolving intensity and ball arc accordingly under regular mode. Intelligent control can do well in random changes of revolving intensity, ball curve (long and short ranges),

❶ Press **Intelligent Control** button and the indicator along with A+B Random indicator and the central indicator of Random Mode lights up, which means that intelligent control serving mode has been applied for point 1 to 9 on the entire court.

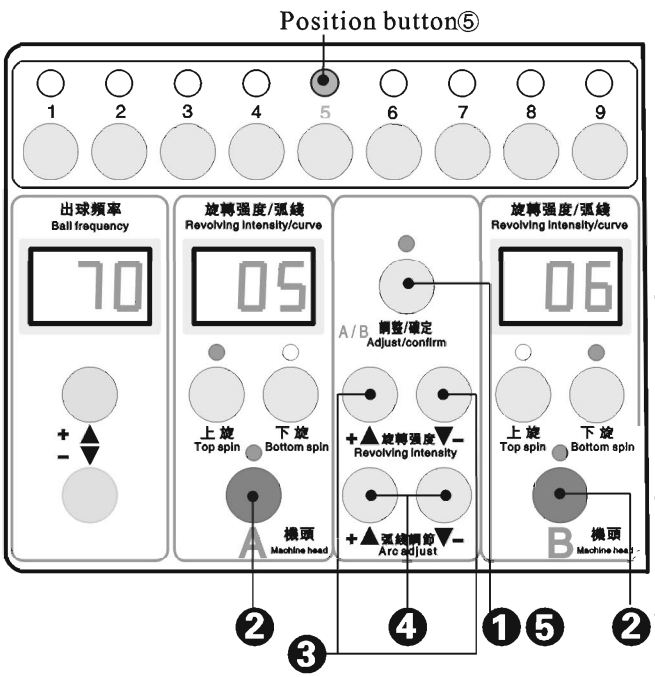
❷ If intelligent control serving mode is required on the right-half or left-half of the court, press **Random Mode** button and the corresponding indicator lights up in red.

❸ Press **On/Off** button and the set A+B intelligent control serving mode is applied for the entire court (or right-half/left-half court).

Reminder

1. In case of need, the revolving intensity or ball curve can be adjusted while in services by pressing *Adjust/Confirm* button.(Please refer to the procedure of *Adjust/Confirm* on page 9.)
2. Press **Intelligent Control** button again, the indicator lights out and the serving mode changes to A+B random mode.

(7) Procedure for A/B Adjust/confirm



Under inbuilt mode and self program mode, the revolving intensity and ball curve in services shall be subject to modification or adjustment under Adjust/Confirm function. (Adjustment under regular mode is invalid.) For random mode and A+B mode, it is possible to adjust under either regular mode or Adjust/Confirm function.

❶ Press **Adjust/Confirm** button and the indicator of Machine Head A or B lights up. Indicator of landing point ④ A is on for Machine Head A while the indicator for the other head (⑥ for Machine Head B)is off. Default of ball frequency is 30pcs/min.

❷ Choose the machine head of either A or B, which is to be adjusted. (if the indicator of the head is on, the step can be skipped.)

❸ Press **Revolving Intensity +▲** or **▼−** button and the intensity value, which ranges from 01 to 15, is displayed on the digital screen. For each press, the intensity value is increased or decreased by 1 score.Press the button without release and the adjustment speeds up. The higher the value is the higher degree of intensity.

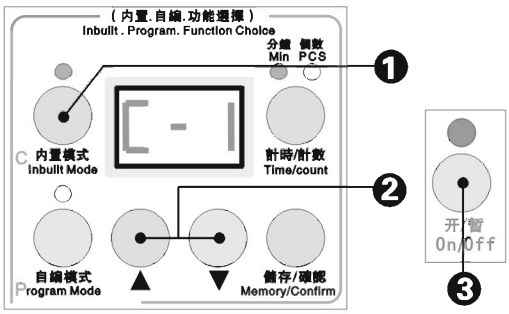
❹ Press **Arc Adjust+▲** or **▼−** button and the curve value, which ranges from 01 to 50, is displayed on the digital screen. For each press, the curve value is increased or decreased by 1 score. Press the button without release and the adjustment speeds up. The higher the value is the higher degree of curve.
So far, adjustment for one head is finished, repeat step ❷,❸ and ❹ for the other.

❺ Press **Adjust/Confirm** button, the robot continues to work under the mode and frequency before adjustment.

Inbuilt program serving mode

For robots fresh from factory, there are five inbuilt programs in the memory. A single program or compound programs can be chosen to serve. For single program serving, one of the 5 programs is chosen and displayed on the digital screen as C-1~5. For compound programs, 2 to 5 of the programs are picked up and displayed on the digital screen as CA1~5 . Under this serving mode, The edited single programs shift automatically, along with which, the parameter of each program changes as well.

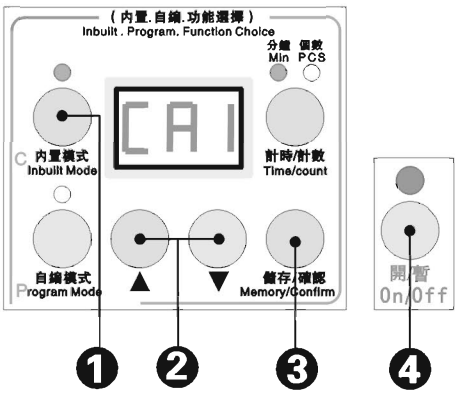
(8) Procedure for inbuilt single program serving mode



1. Press **Inbuilt Mode** button and the indicator lights up. The inbuilt program of last application is displayed on the digital screen as C-1~5.
2. Press ▲ or ▼ and choose one of the programs. For each press, it is increased or decreased by 1.
3. Press **On/Off** button and the robot starts to serve.

Reminder: the shifting of single program can be done while the robot is in services.

(9) Procedure for inbuilt compound program serving mode



1. Press **Inbuilt Mode** button and the indicator lights up. The inbuilt program of last application is displayed on the digital screen as CA1~5.
2. Press ▲ or ▼ and choose one of the programs. For each press, it is increased or decreased by 1.
3. Press **Memory/Confirm** button
   Repeat step ② and ③ to choose the 2nd, 3rd... The maximum number of choice is 5.
4. Press **On/Off** button and the robot starts to serve.(The last program is replaced and deleted.)

Notes: Compound programs are the combination of 2 to 5 single programs.

For instance: Single program 1, 3 and 4 have been chosen for the combination.

1. Press **Inbuilt Mode** button and the indicator lights up. The inbuilt program of last application is displayed on the digital screen as CA1~5.
2. Press ▲ or ▼ and CA1 is displayed on the screen.
3. Press **Memory/Confirm** button and program 1 is chosen and stored.
   Repeat step ❷ and CA3 is displayed on the screen.
   Repeat step ❸ and program 1 is chosen and stored.
   Repeat step ❷ and CA4 is displayed on the screen.
   Repeat step ❸ and program 4 is chosen and stored.
4. Press **On/Off** button and the robot starts to serve. (The last program is replaced and deleted.)

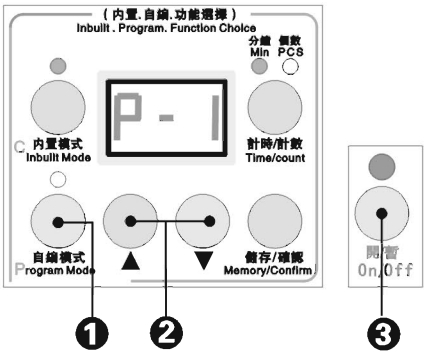
Reminder

1. *For inbuilt mode, adjustment under regular mode is invalid.*
2. *In case of need, the revolving intensity or ball curve can be adjusted in services by pressing Adjust/Confirm button. (Please refer to the procedure of Adjust/Confirm on page 9.)*

Self program serving mode

Under self program mode, the programs are edited and stored. A maximum of 5 programs can be stored in the memory. For single program serving, one of the programs is picked up and displayed on the screen as P-1~5. For compound programs, 2 to 5 programs are chosen and displayed on the screen as PA1~5. Under this serving mode, the programs automatically shift the sequence from 1 to 5, along with which, the parameter of each changes as well.

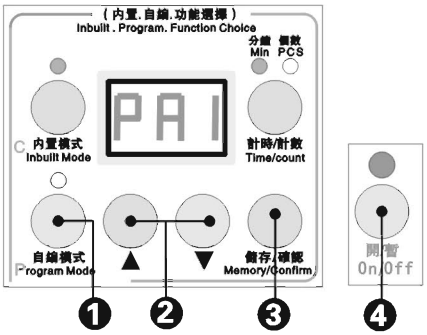
(10) Procedure for single self program serving mode



1. Press **Program Mode** button and the indicator lights up. The program of last application is displayed on the digital screen as P-1~5.
2. Press ▲ or ▼ and choose one of the programs. For each press, it is increased or decreased by 1.
3. Press **On/Off** button and the robot starts to serve.

Reminder: the shifting of single program can be handled while the robot is in services.

(11) Procedure for compound self program serving mode



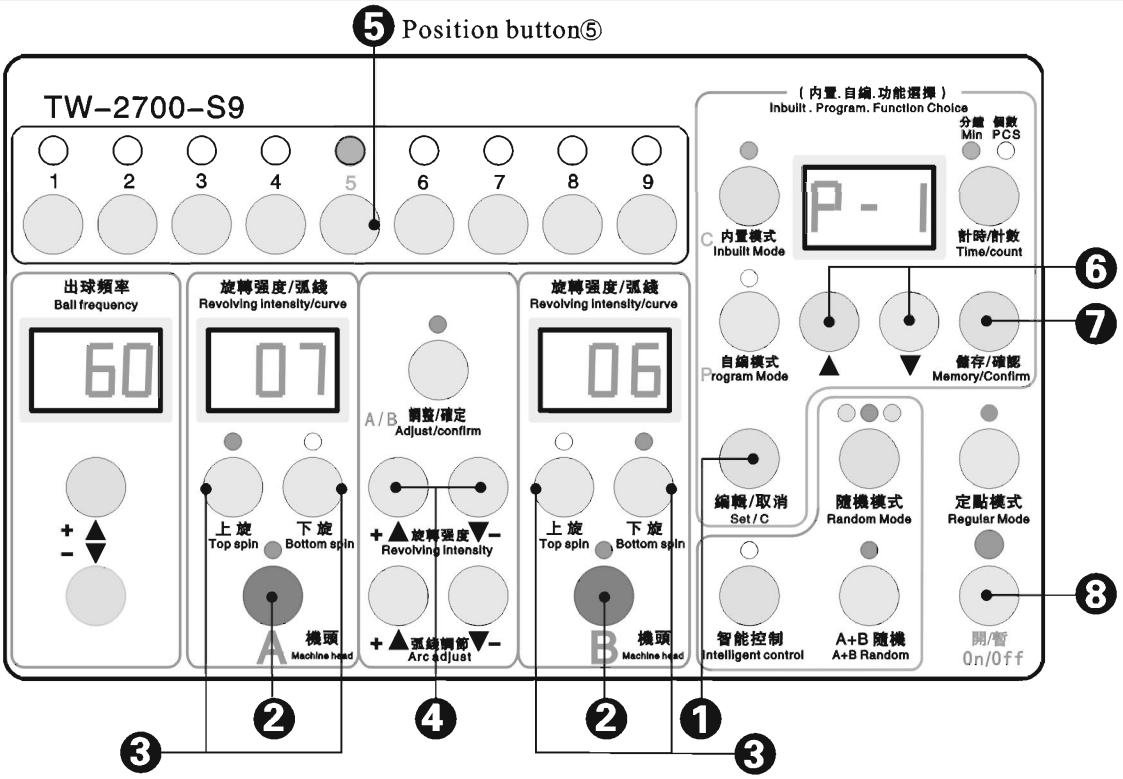
1. Press **Program Mode** button and the indicator lights up. The program of last application is displayed on the digital screen as PA1~5.
2. Press ▲ or ▼ and choose one of the programs. For each press, it is increased or decreased by 1.
3. Press **Memory/Confirm** button,
   Repeat step 2 and 3 to choose the 2nd, 3rd... The maximum number of choice is 5.
4. Press **On/Off** button and the robot starts to serve. The last program is replaced and deleted.

Reminder

1. The user can edit and store programs of his own.
2. In case of need, the revolving intensity or ball curve can be adjusted in services by pressing Adjust/Confirm button. (Please refer to the procedure of *Adjust/Confirm* on page 9.)

Reminder: Serving modes and programs can be shifted while in service.

(12) Procedure for editing serving programs



Before program editing, please set topspin for Machine Head A and bottom spin for B, revolving intensity and ball arc according to the user's need under regular mode. Edited programs can be stored in the memory.

❶ Press Set/C button and the indicator of Program Mode lights up and. Memory of last application is displayed on the screen as P-1~5. As the indicator for Machine Head A or B and one of landing point indicator flashes, it is ready for editing. (Note: If Set/C button is pressed in service, the robot stops automatically.)

❷ Press Machine Head A button and its indicator lights up.

❸ Press Topspin or Bottom Spin and the corresponding indicator lights up. (If set properly before editing, this step can be skipped.)

❹ Press Revolving Intensity +▲ ▼– to choose the intensity. (If set properly before editing, this step can be skipped.)

❺ Press Horizontal Position button and select a landing point from point 1 to 9, the indicator of which lights up accordingly.
So far the edit/storage of one landing point for Machine Head A is finished. (Buttons such as Topspin, Bottom Spin and Revolving Intensity are no longer valid.)
If the editing for Machine Head A continues, repeat step❺ to edit the 2nd, 3rd, 4th ...landing point. The maximum number of edited landing points is 32.
So far the editing of landing points for Machine Head A is completed.
Repeat step❷,❸, ❹ and ❺ to have Machine Head B edited.

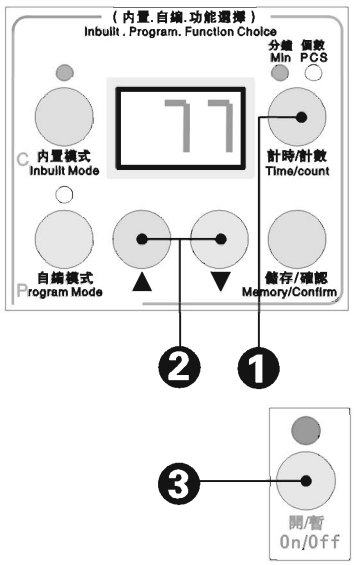
❻ Press program adjusting button ▲ or ▼ and choose the program to be replaced. (E.g.: If program 4 is to be replaced, press the button till P-4 is displayed on the screen.)

❼ Press Memory/Confirm button and the edited program has program 4 replaced. The digital display of P-4 disappears.

❽ Press On/Off button and the indicator lights up. The edited program is thus applied in services. (Former program of P-4 has been replaced and deleted.)

Reminder For any modification during editing, press Set/C button. For each press, the last edited landing point is eradicated.

(13) Timer/Counter



Procedure for Timer/Counter
(Valid under the status of Pause)

★ Timing function

❶ Press Time/Count button and its indicator lights up.

❷ a. Press ▲ once and time increases by 1 minute. Press the button without release and the increase speeds up. The maximum length is 120 minutes.

b. Press ▼ once and time increases by 1 minute. Press the button without release and the decrease speeds up.

★ Counting function

❶ Press Time/Count button and its indicator lights up.

❷ a. Press ▲ once and count increases by 10 balls. Press the button without release and the increase speeds up. The maximum number is 990.

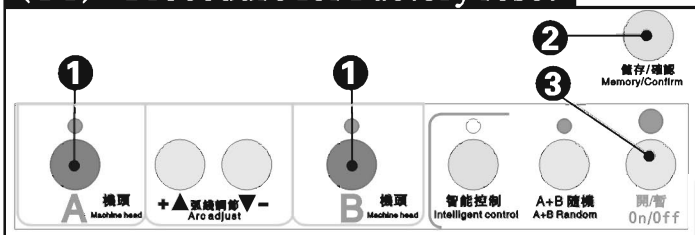
b. Press ▼ once and count increases by 10 balls. Press the button without release and the decrease speeds up.

❸ Press On/Off button and the robot starts to serve. Meanwhile, timing and counting starts too. The robot stops automatically when the set time or count is reached.

★Press Time/Count button again, the two indicators turn off and the function of timing/counting is cancelled.

Reminder: Under regular mode, random mode and A+B random mode, time or count is displayed. Press Time/Count button under inbuilt and self program modes, the display is about 5 seconds.

(14) Procedure for Factory reset



❶ Press A and B at the same time.

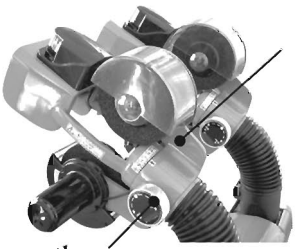
❷ Press Memory/Confirm button and ≡≡≡ is displayed for Machine Head A and B.

❸ Press On/Off to restore the parameters of factory reset.

Reminder: Press any other button instead of step ❸ and factory reset is cancelled.

七. Spin angles

Side spin is achieved by adjusting the upper and lower spinning gears as well as the angle of spinning support, seen in the picture on the right.



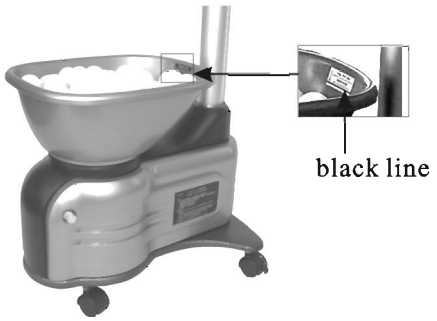
1.Loosen the screw

2.Adjust the spinning support for any angle and have it fastened again

八. Capacity of the collection tray

Capacity: 120 40mm balls. The balls shall not exceed the inside label and black line on the tray.

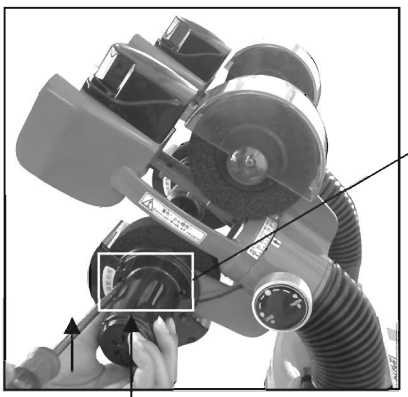
Notes: Nothing other than balls can be put in the tray; otherwise the parts and the normal services of the robot may be damaged or interrupted.

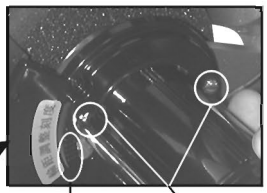


九. How to adjust and change spin gear

一、How to adjust spin gear

When the machine is used for a long time, the two spin gears may be worn down, which may weaken the serving power. In this situation the distance between two spin gears should be adjusted.





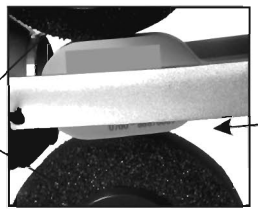
Calibration for adjusting the distance between two gears

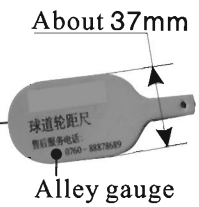
Added plate screw

Top and Bottom spin gears

Bottom spin gear parts

Picture 1





About 37mm

Alley gauge

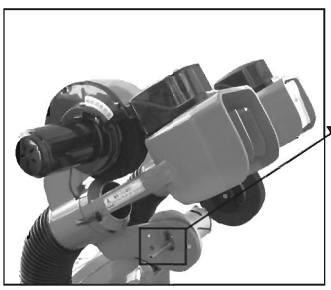
Picture 2

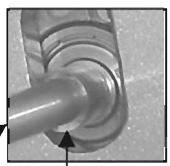
Switch off the power supply. Use the screwdriver to slightly unscrew the two added plate screws, and upraise the bottom spin gear parts about 2 to 3 mm (about one calibration) (can also put the alley gauge between the two gears as the criterion for the opening, see picture 2). Then screw tightly the screws. Turn on the machine. Try a serving and observe if the falling positions and force are in accordance with requirements.

Note: the adjusting range of spin gears is big. Generally it can still be used after adjustment. If the diameter wear is 70 mm it can be changed.

二、How to change spin gear

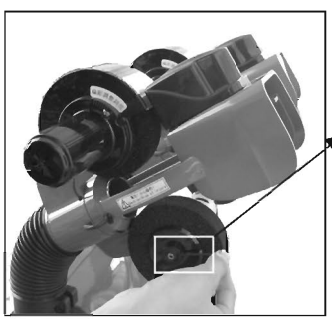
1. Switch off the power supply. Use the bundled screwdriver to unscrew the three screws on the bottom spin motor mask, and remove the bottom spin motor mask.
2. Use the inner hexagon spanner to remove the top and bottom spin gears. Attach the compass tube to the extension stem (See picture 1) and then put the bundled two spin gears onto the top and bottom added plate motors. Use the inner hexagon spanner to tighten the two gears and fix the inner hexagon screw on the gears. Slightly unscrew the added plate screw and put a Ping Pong ball between the two spin gears. Make sure the distance between two gears is about 37 mm. Then fix the added plate screw.
3. Put the bottom spin motor cover and turn on the machine. Try a serving and observe the falling positions and force.

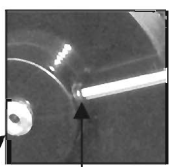




Compass tube

Picture 1





Inner hexagon spanner

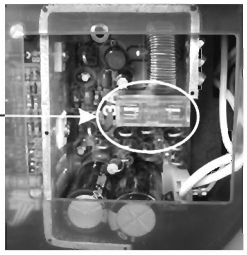
Picture 2

Notes: 1) when the falling position and force is not appropriate, you may adjust at the same time the distance between top and bottom spin gears.

2) when the wear is serious and needs to be changed, please contact local distributors and follow their instruction to change.

十. How to change protection tube

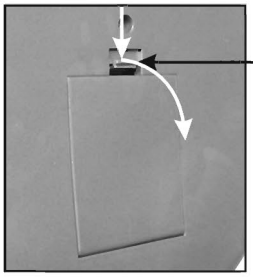
When the protective tube needs to be changed, please switch off the power supply and open the door. The protective tubes are at the jaw opening of the transparent cover. Follow the picture to pull out the tube cover and take out the bad protective tube. Install the qualified and with same specifications protective tube and the tube cover.

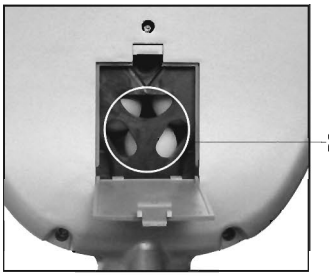


十一. How to remove stuck ball

A ball is stuck mainly due to a damaged ball blocking or other stuff gathering in the alley, therefore make sure not to let any damaged balls or other stuff fall into the collection dish. If the machine stops automatically, and the four lights on the control panel light up, please switch off the power supply for checking.

(1) Checking the alley fork



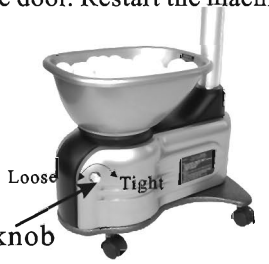


❶ Firstly please open the cover on the alley fork on the back side of the machine. (See picture above)

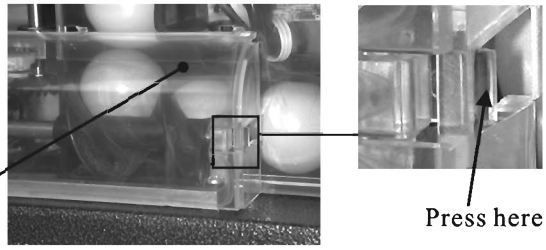
❷ Use a screwdriver to move left and right the Ping Pong ball on the alley fork to see if there is any stuck. If there is stuck move the Ping Pong ball with force into the left or the right alleys.

(2) Checking the alley entrance

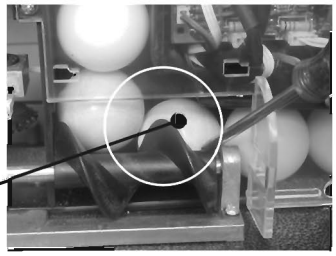
A ball may be stuck due to a damaged ball blocking the alley. If a ball is stuck, please switch off the main power supply and then open the door to remove the screw rod protecting hood. Then pick out the damaged ball following the indication on the picture. Finally put the screw rod protecting hood back and close the door. Restart the machine.



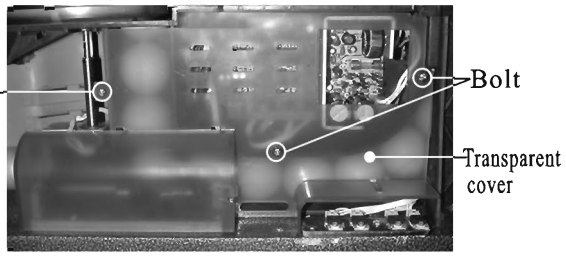
❶ Loosen the door knob to open the door.



❷ As shown on above picture, press the fasten position and push the screw rod protecting hood to the left to take it out.



❸ Use a screwdriver to make the stuck Ping Pong ball up and not stuck anymore. Move its position. Then turn on the machine to move the damaged ball out of the machine head. Finally put the screw rod protecting hood back and close the door. Restart the machine.



★ If there is serious bad ball or other stuff the transparent cover needs to be removed (unscrew the three screws shown on above picture and remove the transparent cover.) Pick out all the stuck balls or other stuffs and put the cover back. Finally restart the machine.

十二. Breakdown and troubleshooting and treatment

Problem	Reason to the problem	Troubleshooting method
The machine is not working	1. The light on the control panel does not light up	• Check if the plug is correctly plugged in
		• Check if the AC Switch is on, and if the switch light lights up
		• Check if the plug of the control panel is plugged correctly and firmly.
		• Switch off the main power supply and check if the protective tube on the main board at the basement is burned out (P14).
		• Check if all plugs are plugged correctly and firmly.
	2. The light on the control panel lights up.	• Check if the buttons on the control panel is jammed and cannot return.
		• Press the ON/OFF button to see if the light turns into green from red.
	3. The three function buttons and the ON/OFF button are shining	• Check if there is any stuck ball (Please refer to P14 and the chapter of <XI. How to remove stuck ball>)
The control panel is out of order	1. The lights on the control panel is shining	• Switch off the main power supply and restart after 10 seconds
	2. The ON/OFF button is out of control	• Switch off the main power supply. Check if the plug is correctly plugged and restart.
If problem still occurs, please contact our maintenance center. Tel:		

十三. Maintenance of the Table Tennis Serving Robot

1. The electrical parts of this machine are mainly composed by main board and operating board, which are the directing system of the machine. It should be prevented from strong vibration and any liquid to avoid short circuit or electricity leakage resulting in damage to the inner components.
2. After long time use, the spin gears may be worn and lead to inaccuracy of falling position and insufficient force of serving. Then you may adjust the distance between them. Please refer to *How to adjust spin gears*.
3. When the machine is used for a period of time, there might be dirt or debris gathering in the alley. Remove the transparent cover regularly (one to two months) to clean Ping Pong ball and the alley.
4. When you do not use the machine for a long time, please switch off the power supply and cover the machine with cloth or plastic.