

AOYUE[®] Int732

Game Console Reworking System

INSTRUCTION MANUAL

Thank you for purchasing Aoyue Int732 Game Console Reworking System.
It is important to read the manual before using the equipment.
Please keep manual in accessible place for future reference.

This manual is designed to familiarize the technician with the proper operation and maintenance of the equipment. The "Care and Safety Precautions" section explains the hazards of using any type of soldering or reworking device. Please read carefully and observe the guidelines in order to maximize usage and minimize the risk of injury or accidents .

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BASIC TROUBLESHOOTING GUIDE

PROBLEM 1: THE UNIT HAS NO POWER

1. Check if the unit is switched ON.
2. Check the fuse. Replace with the same type if fuse is blown.
3. Check the power cord and ensure there are no disconnections.
4. Verify that the unit is properly connected to the power source.

PROBLEM 2: PANEL DISPLAYS "- - - -" MESSAGES

DESCRIPTION: Display show "- - - -"

- - - - **A** — Temperature probe A not detected
- - - - **b** — Temperature probe b not detected
- - - - **C** — Temperature probe C not detected
- - - - **F** — Solder Iron not attached.

SOLUTION: Turn off power and back on. Check the connection of external sensors, Top heater tool and solder iron, connect plugs properly into its receptacle. Check if the temperature probe tip is still intact.

PROBLEM 3: DISPLAY AND OTHER DEVICE OPERATION

ISSUES

SOLUTION: Turn off power and back on.

OTHER PROBLEMS NOT MENTIONED:

Contact the vendor.

Please write down your serial number, batch number and system codes on the space provided.

These information are need for product support and services.

Batch number: _____

Serial number: _____

System Code: _____

Batch number—green sticker located underneath the system.

Serial number—white sticker located underneath the system.

System Code— white sticker with signed number combination.

PROBE CALIBRATION PROCEDURES

9. The calibration numbers can be adjusted by pressing the increase and decrease buttons. To reach negative calibration numbers press the increase button until the displayed value shows a negative number. To save the calibration numbers repeatedly press the selection button until you loop back to probe A calibration adjustment screen **"Set Top 045A"**.
10. Repeat procedures 3, 4, and 5 to check if further calibration is needed. Calibration is not needed if the actual displayed temperature and the measured temperature of the type k thermocouple temperature meter is within ± 2 degrees of each other.

Note: Default factory calibration is based on our calibrated type K thermocouple temperature sensor meters, Standard Type K thermocouple temperature sensor meters available in the market may have accuracy ratings ranging from $\pm 0.25\%$ to $\pm 1\%$ of the reading.

Additional Calibration Examples:

- Probe "A" needs to be recalibrated *lower* by 10 degrees. i.e. Probe "A" 260 vs. 250*

Example: if the calibration number of Probe A is already **"Set Top 001A"** we *subtract* 10 from the old number +01 [$+01-10=-9$]. So we input **"Set Top -09A"** as the new calibration number for probe "A". To input negative numbers press the increase button until the displayed value shows a negative number

- Probe "b" needs to be recalibrated *higher* by 10 degrees. i.e. Probe "b" 250 vs 260*

Example: if the calibration number of Probe "b" is already **"Set bot -50b"** we *add* 10 to the old number -50 [$-50+10=-40$]. So we input **"Set bot -40b"** as the new calibration number for probe "b".

- Probe "C" needs to be recalibrated *higher* by 10 degrees. i.e. Probe "b" 240 vs 250*

Example: if the calibration number of Probe "C" is already **"Set bot -01C"** we *add* 10 from the number -01 [$-01+10=+9$]. So we input **"Set bot 009C"** as the new calibration number for probe "C".

*type k thermocouple temperature meter reading.

Warning!

Do not access the system calibration types 3,5,6,7,8,9. Do not alter or enter these modes as it can clear primary level factory calibration of your system.

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CARE and SAFETY PRECAUTIONS



CAUTION: Improper usage can cause injury and physical damage. For your own safety, please observe the following precautions.

- Temperature may reach as high as 500°C when turned ON.
 - Do not touch the heating element inside the pre-heater.
 - Do not expose skin to infra-red light for long periods.
 - Prolonged exposure may damage the skin tissue.
- Handle with care
 - Never drop or sharply jolt the unit.
 - Contains delicate parts such as IR tubes that may break if the unit is dropped
 - Do not spill any liquid to the system.
- Do not tamper the electrical control unit or any wiring inside the device.
- Disconnect plug from main power source if the device will not be used for a long period.
 - Turn off power during breaks, if possible.
- Allow ample time for the equipment to cool down before commencing maintenance.
- Use only genuine replacement parts. Turn-off power and let the unit cool down before replacing any component.

PROBE CALIBRATION PROCEDURES

5. With the adjustment value assessed we enter calibration system by turning off the system and back on. While the system is in type selection screen simultaneously press and hold the increase and decrease button (*#3 & #4 form the control panel guide*) until **"SLCt typE 4"** is displayed. Press the selection button (*#2 form the control panel guide*) to enter calibration mode.
6. The display would show **"Set Top ###A"** indicating we are now in calibration mode. The ### indicates a calibration number saved in the CPU memory. The calibration number can be positive or negative depending on factory calibration. The default numbers are 001. Pressing the selection button allows us to cycle thru the calibration numbers of probes "A", "b", and "C". These numbers have suffixes that corresponds to their probe. Therefore if the display is **"Set Top 045A"** we are adjusting the calibration of probe "A", **"Set bot 040b"** means we are adjusting the calibration for probe "b" and **"Set bot -40C"** is for calibration of probe "C".
7. Based on our previous assessment in procedures 3,4 and 5.
 - Probe "A" needs to be recalibrated *lower* by 5 degrees.

Example: if the calibration number of Probe A is already **"Set Top 045A"** we *subtract* 5 from the old number +45 [$+45-5=+40$]. So we input **"Set Top 040A"** as the new calibration number for probe "A".
 - Probe "b" needs to be recalibrated *higher* by 5 degrees.

Example: if the calibration number of Probe "b" is already **"Set bot 040b"** we *add* 5 to the old number +40 [$+40+5=+45$]. So we input **"Set bot 045b"** as the new calibration number for probe "b".
 - Probe "C" needs to be recalibrated *lower* by 10 degrees.

Example: if the calibration number of Probe "C" is already **"Set bot -40C"** we *subtract* 10 from the number -40 [$-40-10=-50$]. So we input **"Set bot -50C"** as the new calibration number for probe "C".

PROBE CALIBRATION PROCEDURES

The system is equipped with a digital calibration system to allow us to calibrate the external probes with a Type K thermocouple temperature meter .

IMPORTANT: Probes must be calibrated one at a time. The tip of Probe "A" should not come in contact with the tip of Probe "b" or probe "C".

1. Place the sensor tip of probe "A" and the reference Type K thermocouple temperature meter as close together as possible. It is best that the tips be firmly taped together for accurate calibration.
2. Enter Type 0 mode and set top heater temperature to 250C. Place the tips underneath the top heater. Wait for the actual temperature display of probe "A" to reach 250C. (Any value between 230 to 250 is acceptable).
3. Compare the actual probe "A" value displayed on the 732 system with the Type K thermocouple temperature meter. For example: the 732 displays probe "A" as 250C while the Type K thermocouple temperature meter is showing 245C. This means that we need to decrease the calibration value of probe "A" by 5 degrees.
5. Again tape together the sensor tips of probe "B" and the sensor tip of the type K thermocouple temperature meter. Place them underneath the Top heater and check the difference between the actual temperature display of probe "b" and the value registered in the Type K thermocouple temperature meter. When the temperature reaches 250C. For example: the 732 displays probe "b" as 245C while the Type K thermocouple temperature meter is showing 250C. This means that we need to increase the calibration value of probe "b" by 5 degrees.
6. Finally tape together the sensor tips of probe "C" and the sensor tip of the type K thermocouple temperature meter. Place them underneath the Top heater and check the difference between the actual temperature display of probe "C" and the value registered in the Type K thermocouple temperature meter. When the temperature reaches 250C. For example: the 732 displays probe "C" as 260C while the Type K thermocouple temperature meter is showing 250C. This means that we need to decrease the calibration value of probe "b" by 10 degrees.

PRODUCT DESCRIPTION

The Aoyue Int732 Game Console Repairing System is a reworking equipment that combines infrared and hot air heating technology, to provide top and bottom heating to the target components. It is equipped with a versatile board holder, Lead free compatible solder Iron, and software profile control of heating in one sophisticated package. It is designed for reworking double-sided, diverse technology printed circuit boards which utilizes traditional or lead free solder.

The system is equipped with High powered IR-heating elements combined with multiple types of operating mode to fit various task. Finally, the unique, innovative design with digital control panel offers precision, safety, and ease of use to meet all reworking requirements.

FUNCTIONS and FEATURES

- Complete Game Console Repairing System.-Combines large area bottom-heater, high powered top-heater and lead free compatible solder iron.
- Three different types of operation to suite different needs:
 - Type 0 – For re-balling or pre-baking the board. Uses internal sensors.
 - Type 1 – Allows manual control of the rework process. Uses external sensors.
 - Type 2 – Automated reflowing process utilizing the user configurable profile.
- Closed Loop Temperature Control with Three External Sensors
 - Sensors attached to the board allows precise temperature control at board level minimizing damage to board due to inaccurate temperature settings or overheating. Two sensors are used as temperature control and monitoring, while an extra sensor is added to allow additional monitoring of other temperature sensitive areas of the PCB.
- Enhanced Top and bottom heater
 - 310 x 310 mm effective bottom heating area. 1500 watts of pre-heating power minimizes board warping.
 - 60 x 60 mm effective top heating area. 500 watts maximum heating power with various nozzles to fit different BGA sizes.
- Multi-Point Board Holder
 - Innovative board holder: Nine securing screws with four side grips to provide a secure fit for various board sizes and shapes. Effectively minimizes BGA balls shorting together due to board warping.

FUNCTIONS and FEATURES

- Multi-Axis Armature
 - Top heater's support allows 3 degrees of freedom: Rotation of the Top heater, Swiveling of the armature, and sliding adjustments. This new design expands the effective working coverage of the unit, allowing us to access even those ICs at the edge or corner of the PCBs.
- Digital System Control and Safety
 - CPU controlled system with easy to use digital controls and display. Uses advanced digital controls and signal processing for maximum performance, and accuracy. Built-in overheat protection and temperature limiting. The system automatically limits the rise in temperature to industry standard 3 degrees per second. This will minimize damage to sensitive components and ensure proper reflow.
- Profile mode with auto adjustment
 - Eight programmable 9 segment reworking profile. Set and store the desired duration and temperature to ensure high success rate for repetitive reworks. Equipped with auto profile adjustment, system auto edits your profile to ensure profile meets industry standard limits.
- Two types of Automation Mode
 - 4 profiles are allotted for the temperature hold method, in which the temperature and the hold duration are the basis for profile generation. And another 4 profiles are allotted for the time ramp mode in which the profile generation is based on the time allotted to reach desired temperature.
- The Integrated Solder Iron has excellent thermal recovery specifically designed for the lead free soldering process. It has a wide range of tips sizes and styles designed to fit different requirements. Select tunnel type when cleaning BGAs, use the blade type for drag soldering, conical types for normal thru-hole soldering and many more different tip size and styles.
- Wide Compatibility
 - The entire system is compatible with Lead free solder, is RoHS, CE and ESD Safe compliant.

OPERATING PROCEDURES

Airflow Control:

The airflow control knob is located at the back of the system. (**#17** from the *control panel guide*).

- The airflow control knob can be adjusted to accommodate different IC sizes and reworking jobs. Adjust airflow to appropriate level to obtain best reworking results.
- It is not recommended to use the system at very low airflow levels as the system is developed to give best results at higher airflow levels.

Notes:

- ***There is a built in protection feature to automatically limit the temperature slope to no more than 3 degrees per second. Therefore the maximum set temperature will be based on your set time.***
- ***During automated reflow the down button maybe pressed to see the target temperature during each segment. The target temperature has a suffix "c".***

OPERATING PROCEDURES

9. To start automation repeatedly press the selection button until the display shows the word **"Run Prof 0"** (the bottom display number should correspond to the selected profile) then press the increase button. A 3 second countdown will commence before automated reworking starts.
10. To see the running time, or current segment the system is processing or the temperature of the temperature probes. repeatedly press the selection button to switch between different views. Follow the suffix guide to determine displayed temperature.
4. After the process is finish the display will show **"End"**, the middle and bottom display would show the temperature of the probes. Press the increase button to save the profile and exit to profile adjustment mode.
5. To exit before the process is finished press the increase button while the profile is running. The system would exit and return to profile adjustment mode.

Sample Profile :

SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	SEG7	SEG8	SEG9
090t	60t	150t	050t	060t	60t	050t	060t	60t
100C	150C	210C	190C	210C	230C	190C	210C	230C

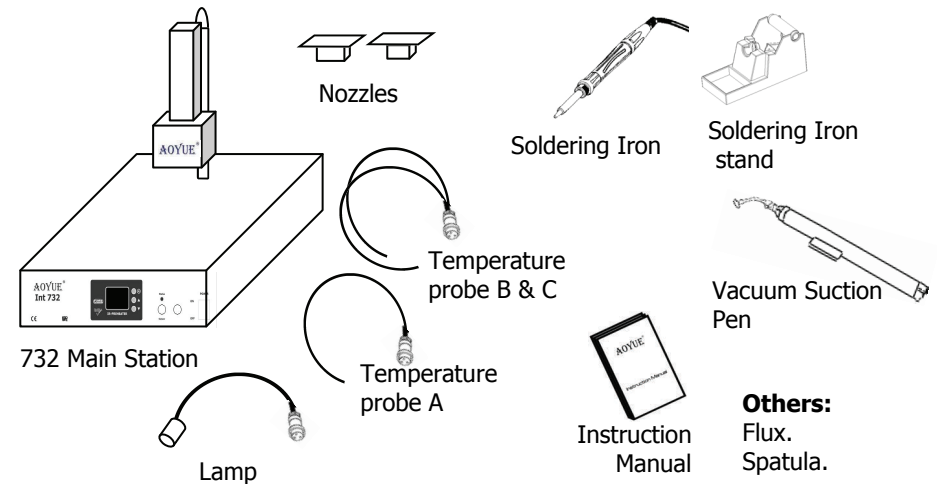
Segment one is set to 90 seconds to reach 100C. Which means after 50seconds at the end of segment one the temperature should reach 100C. Then Segment two is set to 60 seconds to reach 150C, which means by the end of 60 seconds (total running time after segment two is already 90+60=150 seconds) the set temperature should reach 150C, so on and so forth.

To check the slope from segment Three :

- 210C - 150C =60C ;Time to reach 210C is set to 150seconds.
- Therefore the slope is 60/110= 0.54 degrees per second increase.

Note: a negative number would denote a declining slope.

PACKAGE INCLUSION



SPECIFICATIONS*

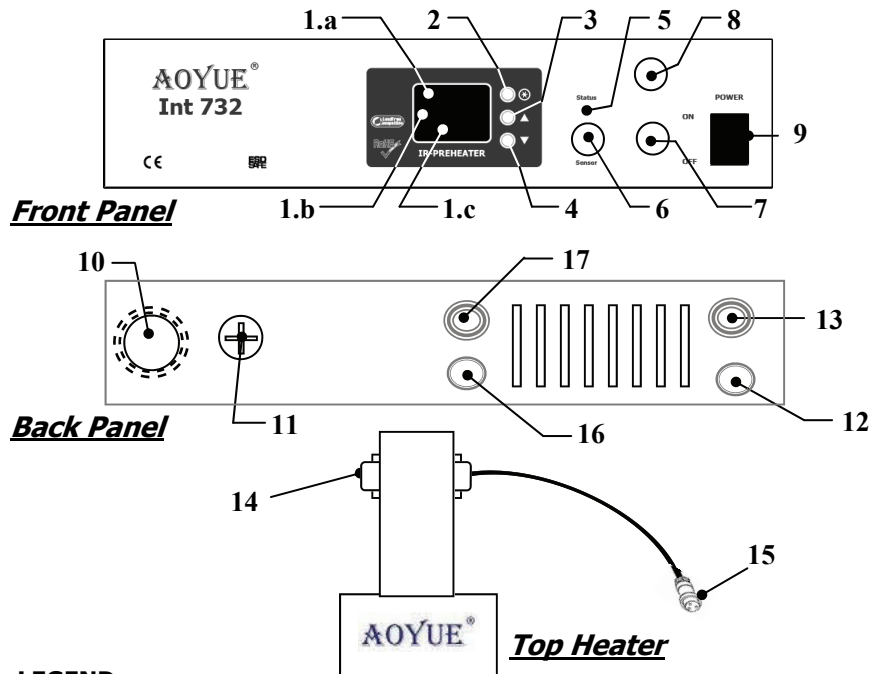
Power Input:	Available in 110V 21Amps / 220V 11 Amps (Max)
Dimensions:	Main Unit: 520(l) x 370(w) x 410(h) mm Board Holder: 450(l) x 280(w) x 134(h) mm
Power Consumption:	Total : 2100 Watts Maximum Top Heater: 500 Watts Bottom Heater: 1500 Watts Solder Iron: 75 Watts
Temperature Range:	50°C - 280°C (^maximum)
Weight:	Approx. 11.6 Kg
Heating Element:	Top Heater: Forced Convection Quartz Infrared Bottom Heater: Quartz Infrared Solder Iron: Ceramic heater
Pre-Heating Area:	Top Heater: 60 x 60 mm Bottom Heater: 310 x 310 mm

^Depends on type of operation

*Specifications subject to change without prior notice

*** Expansion for future versions, may not be available for current releases.

CONTROL PANEL GUIDE



LEGEND:

- | | |
|-----------------------------------|----------------------------------|
| 1 — Digital Display | 8 — Lamp Attachment |
| 1.a Top Display | 9 — Main Power Switch |
| 1.b Middle Display | 10 — Power Cord |
| 1.c Bottom Display | 11 — Fuse Holder |
| 2 — Selection Button | 12 — Top Heater Power Cord |
| 3 — Increase Button/ Enter Button | 13 — Top Heater Sensor Connector |
| 4 — Decrease Button | 14 — Top Heater Power Connector |
| 5 — Status LED | 15 — Top Heater Sensor Cord |
| 6 — Probe B & C Connector | 16 — Probe A Connector |
| 7 — Solder Iron Connector | 17 — Airflow control |

Suffix guide:

- A* - Actual Temperature of Sensor "A" / Set Temperature of Top Heater.
- b* - Actual Temperature of Sensor "b" / Set Temperature of Bottom Heater.
- c* - Actual Temperature of Sensor "c".
- g* - Actual Temperature of Top Heater Internal Sensor.
- E* - Actual Temperature of Bottom heater Internal Sensor.
- F* - Set/Actual Temperature of Solder Iron.

OPERATING PROCEDURES

Profile 4 to 7: Time ramp profiling system.

- To adjust the time and temperature profile of each segment press the selection button twice. The top display will show which segment "**SEG1**" we are currently adjusting. The middle display will show whether we are adjusting the "**dur**" (duration/Time) or "**tEMP**" (temperature). The bottom display shows the value we are currently adjusting. Its suffix "**t**" signifies we are adjusting the time or temperature for a suffix "**C**".
- Press the increase or decrease button to adjust the desired duration and temperature. The set temperature is adjustable from 50 to 250 C and duration 5 to 200 seconds
- After the duration or temperature is set press the selection button to move to the next segment. There are nine segments available each with its own duration and temperature settings. The duration settings signifies the time it will take to reach our set temperature level. For example: if set duration is 50t and temperature is set at 100C. Then assuming the board temperature is 50C when the automated rework is initialized the system would gradually increase board temperature by 1 Degree per second such that after 50 seconds the board temperature would reach 100C.
- Upon reaching segment 3, we must remember that the set temperature at this segment will be the temperature for the bottom heater for the remainder of the segments. It is ideal that we set segment 4 time to 60 and temperature to the same level as it is in segment 3 to allow both top and bottom temperature to reach equilibrium temperature before increasing the top heater temperature further. Then continue setting up the variables for each of the nine segments.
- To save the newly developed profile repeatedly press the selection button until the display shows "**Save Prof 0**" (the bottom display number should correspond to the selected profile). Press the up button to save the settings and jump to profile selection screen.
- To switch between using the external sensor or internal sensor as reference for the system repeatedly press the selection button until the display shows "**SLCt ref 0**", the bottom display would show either "**0**" signifying the external sensors are used by the system or "**1**" signifying the internal sensors are used. Note: when the internal sensors are used as the reference, the set temperature is adjustable to 550 degrees.

OPERATING PROCEDURES

4. Upon reaching segment 3, we must remember that the set temperature at this segment will be the temperature for the bottom heater for the remainder of the segments.
5. Continue setting up the variables for each of the nine segments. To save the newly developed profile repeatedly press the selection button until the display shows **"Save Prof 0"** (the bottom display number should correspond to the selected profile). Press the up button to save the settings and jump to profile selection screen.
6. To switch between using the external sensor or internal sensor as reference for the system repeatedly press the selection button until the display shows **"SLCt ref 0"**, the bottom display would show either **"0"** signifying the external sensors are used by the system or **"1"** signifying the internal sensor are used. Note: when the internal sensors are used as the reference, the set temperature is adjustable to 550 degrees.
7. To start automation repeatedly press the selection button until the display shows the word **"Run Prof 0"** (the bottom display number should correspond to the selected profile) then press the increase button. A 3 second countdown will commence before automated reworking starts.
8. To see the running time, current segment the system is processing, the hold duration or the temperature of the temperature probes. repeatedly press the selection button to switch between different views. Follow the suffix guide to determine displayed temperature.
9. After the process is finish the display will show **"End"**, the middle and bottom display would show the temperature of the probes. Press the increase button or decrease button to return to profile adjustment mode.
10. To exit before the process is finished press the increase button while the profile is running. The system would exit and return to profile adjustment mode.

OPERATING PROCEDURES

A. INITIAL PROCEDURES

1. Make sure all switches are deactivated.
2. Attach temperature probes b and c to the three pin socket (**#6 on control panel guide**). Attach temperature probe A to probe A Connector (**#16 on control panel guide**)
3. Attach the Top Heater power cord (**#12 on control panel guide**) to the Top heater power connector (**#14 on control panel guide**).
4. Attach the Top heater sensor cord (**#15 from the control panel guide**) to the base connector (**#13 from the control panel guide**).
5. Attach the device to the main power source. It is recommended to use NEMA plugs and receptacles with ratings compliant to the machine specifications (*see page 7*).
6. Adjust airflow control knob (**#17 from the control panel guide**) to the middle position.
7. To turn the unit ON. Toggle the main power switch to ON position (**#9 on control panel guide**).

B. OPERATION TYPE(MODE) SELECTION

1. Follow initial procedures, **"A. INITIAL PROCEDURES"**.
2. The display would show **"TYPE 0"**, which means Type 0 operation will be used. To select between types 0 to 2. Press the increase or decrease buttons (**#3 & #4 of control panel guide**).
3. To confirm selection and enter into operation mode using the selected operation type. Press the selection button (**#2 of control panel guide**).

C. SOLDER IRON UNDER OPERATION TYPE 0 and 1

1. To set the desired solder iron temperature press the selection button repeatedly until the top display shows **"Set"** and the middle display shows **"iron"**. The bottom display would show the current set temperature of the solder iron followed by a suffix **"F"**.

OPERATING PROCEDURES

2. Press the increase or decrease button to adjust the set temperature level. The set temperature is adjustable from 200 to 480C.
3. For the solder iron actual temperature display. Follow **TYPE "0" OPERATION** number 5 (see page 10).
4. To temporarily turn off the solder iron. Simultaneously press both the "Increase" and "decrease" button (**#3 & #4** from the control panel display see page 8). The bottom display will show "OFF" indicating the solder iron is now turned off.

D. TYPE "0" OPERATION

This type of operation utilizes the internal temperature sensors to control the heat. Using this type frees up the three extra external temperature probes for monitoring. Attach the three extra temperature probes to areas of interest such as the bottom of the board and/or near the component to we worked on.

1. To set the desired top heater temperature press the selection button repeatedly until the top display shows "**TOP**" and the middle display shows "**SET**". The bottom display would show the current set temperature of the top heater followed by a suffix "**A**".
2. Press the increase or decrease button to adjust the top heater set temperature level. The set temperature is adjustable from 50 to 550 C in this type of operation. To temporarily turn off the top heater. Simultaneously press both the "Increase" and "decrease" button (**#3 & #4** from the control panel display see page 8). The bottom display will show "OFF" indicating the top heater is now turned off. **Note: In order to reach the maximum temperature it is recommended that a nozzle is attached.**
3. To set the desired bottom heater temperature press the selection button repeatedly until the top display shows "**bot**" and the middle display shows "**SET**". The bottom display would show the current set temperature of the bottom heater followed by a suffix "**b**".

OPERATING PROCEDURES

Note: During segments 1-3 the top heater heats up to 75% of the set temperature at these segments. This is to allow a faster ramp up in preparation for reflow for segments 4-6.

1. To enter type "**2**" operation. Select 2 at the initial screen then press the select button. The display would change to "**Slct Prof 0**". This signifies we are now in the type "**2**" mode.
2. We can then select which profile we would like to use by pressing the increase or decrease button. The number shown at the bottom display will change corresponding to your selection. There are eight stored and selectable profile.

Profile 0 to 3: Temperature hold profiling system.

1. To adjust the ramp, duration and temperature profile of each segment press the selection button until the top display shows "**SEG1**", This signifies we are currently adjusting segment 1 of the profile. The middle display will show whether we are adjusting the "**rate**" (ramp rate) "**dur**" (duration/Time) or "**tEMP**" (temperature). The bottom display shows the value we are currently adjusting. Its suffix "**r**" signifies we are adjusting the ramp rate, "**t**" signifies we are adjusting the time and "**C**" for temperature. Pressing the selection button will allow us to switch between rate, duration and temperature adjustment modes.
2. Press the increase or decrease button to adjust the desired rate, duration or temperature. The set ramp rate is adjustable from 50 to 150 degrees per minute. The set temperature is adjustable from 50 to 250 C and duration 5 to 200 seconds.
3. After the rate duration or temperature is set press the selection button to move to the next segment. There are nine segments available each with its own rate, duration and temperature settings. The duration settings signifies number of seconds the system should hold the set temperature level. The rate settings signifies the ramp rate limit for that particular segment. For example: if set rate is 100, duration is 50t and temperature is set at 100C. The system would increase the temperature to 100C at a ramp rate of 100 degrees per minute. Then when it reaches 100C the system would try to maintain the temperature of 100 for 50 seconds.

OPERATING PROCEDURES

The desired temperature— is the target temperature at which the system must stabilize its heaters for the remainder of the hold duration.

The Time Ramp profiling system:

This system requires the input of two variables, the duration and desired temperature, This two variables would allow the system to automatically compute the ramp rate.

The duration— this the allotted time in seconds to reach the set temperature of each segment.

The desired temperature— is the target temperature to be reached at the end of the duration.

For both types of profiling system there is an option to use the internal sensor or external sensor as reference.

When using the external sensor reference option, the Results of Probe "A" directly controls the Top heater while Probe "b" controls the bottom heater.

When using the internal sensor reference option, the internal top heater sensor "d" regulates the Top heater while the internal bottom heater sensor "E" regulates the bottom heater.

The default sensor reference for all profiles is set to the external sensors.

In both profiling system the first three segments utilizes the bottom heater to preheat the board up to 75% of the required reflow temperature. The bottom heater would regulate the board at the temperature set at segment 3 for the remainder of the segments. Segments 4 to 9 then utilizes the top heater to provide the final 25% of the heat to reach reflow.

OPERATING PROCEDURES

4. Press the increase or decrease button to adjust the bottom heater set temperature level. The set temperature is adjustable from 50 to 280 C in this type of operation. To temporarily turn off the bottom heater simultaneously press both the "Increase" and "decrease" button (*#3 & #4 from the control panel display see page 8*). The bottom display will show "OFF" indicating the bottom heater is now turned off.
5. To view the actual internal temperature read by the Top heater and the bottom heater's internal temperature probe, repeatedly press the selection button until the top display shows the actual value of the top heater internal temperature followed by a suffix "d". The number displayed in the middle row followed by a suffix "E" is for the bottom heater actual internal temperature. The bottom display shows the actual temperature of the soldering iron, it is followed by a suffix "F".
6. To view the actual temperature read by the three external temperature sensor, repeatedly press the selection button until the top display shows the top heater external temperature probe's actual temperature followed by a suffix "A". The middle display will show external temperature probe b's actual measured temperature followed by a suffix "b". And the bottom display would show the actual measured temperature of the external temperature **probe C**. It is followed by a suffix "C".

Note: External temperature probes are labeled. Top heater external probe is labeled A, while the other two is labeled b and C. The displayed actual temperature reading's suffix corresponds to the labels.

E. TYPE "1" OPERATION

Before proceeding with this type of operation, attach the top external temperature **probe A** to one corner of the BGA or IC to be reworked. Then attach the external temperature **probe b** to the underside of the PCB to be worked on, preferably not near the area of the BGA or IC to be reworked on but not directly underneath the BGA or IC. The external temperature **probe C** can be placed near any area of interest.

OPERATING PROCEDURES

This type of operation utilizes the external temperature **probe A** to regulate the top heater, while the external temperature **probe b** regulates the heat of the bottom heater. Using this type of operation allows us to closely control the temperature at board level. While freeing up external temperature **probe C** for additional monitoring.

1. To set the desired top heater temperature press the selection button repeatedly until the top display shows "**TOP**" and the middle display shows "**SET**". The bottom display would show the current set temperature of the top heater followed by a suffix "**A**".
2. Press the increase or decrease button to adjust the top heater set temperature level. The set temperature is adjustable from 50 to 280 C in this type of operation. To temporarily turn off the top heater simultaneously press both the "Increase" and "decrease" button (*#3 & #4 from the control panel display see page 8*). The bottom display will show "OFF" indicating the top heater is now turned off.
3. To set the desired bottom heater temperature press the selection button repeatedly until the top display shows "**bot**" and the middle display shows "**SET**". The bottom display would show the current set temperature of the bottom heater followed by a suffix "**b**".
4. Press the increase or decrease button to adjust the bottom heater set temperature level. The set temperature is adjustable from 50 to 280 C in this type of operation. To temporarily turn off the bottom heater simultaneously press both the "Increase" and "decrease" button (*#3 & #4 from the control panel display see page 8*). The bottom display will show "OFF" indicating the bottom heater is now turned off.
5. For this type (*type 1*) of operation we must closely monitor the actual temperature of the Top heater external temperature **probe A** and the external temperature **probe b**. As this two probes manage the heat of both the top and bottom heater.

OPERATING PROCEDURES

6. To view the actual temperature read by the three external temperature sensor, repeatedly press the selection button until the top display shows the top heater external temperature probe's (**probe A**) actual temperature followed by a suffix "**A**". The middle display will show external temperature **probe b**'s actual measured temperature followed by a suffix "**b**". And the bottom display would show the actual measured temperature of the external temperature **probe C**. It is followed by a suffix "**c**".

Note: Under type "1" mode of operation it is not necessary to monitor the internal temperature sensor's read out. i.e. internal temperature readouts with suffix "d" and "E".

External temperature probes are labeled. Top heater external probe is labeled A, while the other two is labeled b and C. The displayed actual temperature reading's suffix corresponds to the labels.

F. TYPE "2" OPERATION

There are two different profiling system and sensor controls.

The temperature hold profiling system, is allotted to profile slots 0, 1, 2 and 3. While the time ramp profiling system is allotted to profile slots 4, 5, 6, and 7.

The temperature hold profiling system:

This system allows three variables to be controlled in each segment. The ramp rate, the hold duration and the desired temperature.

The ramp rate— is the limit in degrees per minute for the increase of temperature.

The default value for this settings is 100r which means the limit is 100 degrees per minute. (An industry standard recommendation is never to exceed 180 degrees per minute)

The Hold duration— is the duration in seconds in which the system must regulate the heaters at a particular set temperature.