

Electronic Weighing Scale

Service Manual

KWS SW

Welcome to use our company's KWS SW weighing scale !

The product is designed, manufactured and sold independently by our company. We have utilized advanced micro-processing technology during the manufacturing process. The product has such specialties as reliable performance, high weighing accuracy, structure durability and versatile. To offer you better service, we have compiled this manual.

1. Precautions

Please read this manual carefully which will do help you when you have troubles in the process of installation, calibration and operation. You can also know some basic parameters and applications of the scale, and its operating condition from this manual.

- ① The scale cannot be installed and operated in such places as with extreme temperature ($-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$) and humidity ($\geq 90\%$), dust, vibration or excessive air currents and so on.
- ② Before the initial use, the scale should be charged at least 12 hours for full capacity. If the scale would not be used for a long period of time, it also should be charged every three months to guarantee the battery's service life.
- ③ The power supply of the scale should be independent of other powerful electrical appliances.

2. Routine maintenance

- ① When the battery needs charging, be sure that the rated output voltage of the power adapter matches the scale, the electrode of the $\phi 6$ plug matches, and check the rated voltage of the adapter is 110v or 220v.
- ② Charge the battery only when it indeed needs to guarantee the battery's service life. (The lead-acid battery only enables be charged for an average 300 times.)
- ③ You should have regularly check if the load cell is dampened, oxidized or touched by some eyewinkers, and do maintenance work well.
- ④ Please keep the circuit board clean and dust-free. If the circuit board is damped, dry it and also you can brush a layer of insulating varnish to protect it. Be sure all the circuits are intact without electric leakage. Repairing or changing any circuit components should be done by the authority personnel.
- ⑤ The housing of the scale is plastic, which should be kept clean and away from corrosive solvent or gas, and also prevent from being bumped and squeezed by other objects.

- ⑥ The scale should not be used for long time in places with excessive temperatures. If it has to be used under severe condition, please warm-up the scale for 30m before using it; otherwise it may show inaccurate weighing results.

3. Pay attentions when repairing the scale

- ① Do not use a nipper to prod the components randomly.
- ② Pay attention not to make a short circuit when using a multimeter.
- ③ Be sure the soldering iron's temperature not too high and finishing welding in a short period of time when welding the integrated block.
- ④ Do not do a hot-line work.

4. Technical data of components

① 8550 parameters

Operation Temp.:	-55℃---135℃
VCBO:	30V
VCEO:	20V
VEBO:	6V
IC:	1.5A

② LP2951 parameters

Operation Temp.:	-40℃---150℃
Input voltage:	0.3v---30V
T pin Tem. (5s):	260℃
Pressure differential:	50mV—450mV (100 uA <I<100 mA)
Max. load current:	100mA
Accuracy of voltage:	1%

③ LM385-2.5 parameters

Operation Temp.:	0℃---70℃
Reverse current:	30mA
Forward current:	10mA
Reference current variation:	20mV (1 mA <IR<20 mA)
Min. operating current:	20uA
Max. operating current:	20mA

④ Paster fuse parameter

Rated current:	1.1A
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Rated voltage: $>24V$

⑤ HT1632 parameter

Supply voltage: $V_{ss}-0.3V$ to $V_{ss}+6.0V$

Storage Temp.: $-50^{\circ}C$ --- $125^{\circ}C$

Input voltage: $V_{ss}-0.3V$ to $V_{DD}+0.3V$

Operation Temp.: $-25^{\circ}C$ --- $75^{\circ}C$

Operating voltage: $2.4V$ --- $5.5V$

⑥ C(H1601) parameter

Operation Temp.: $-55^{\circ}C$ --- $155^{\circ}C$

Store Temp.: $-55^{\circ}C$ --- $155^{\circ}C$

VCBO $50V$

VCEO $50V$

VEBO $4V$

IC $3A$

Pc $25W$

⑦ HT 7850 parameter

Operation Temp.: $-40^{\circ}C$ --- $85^{\circ}C$

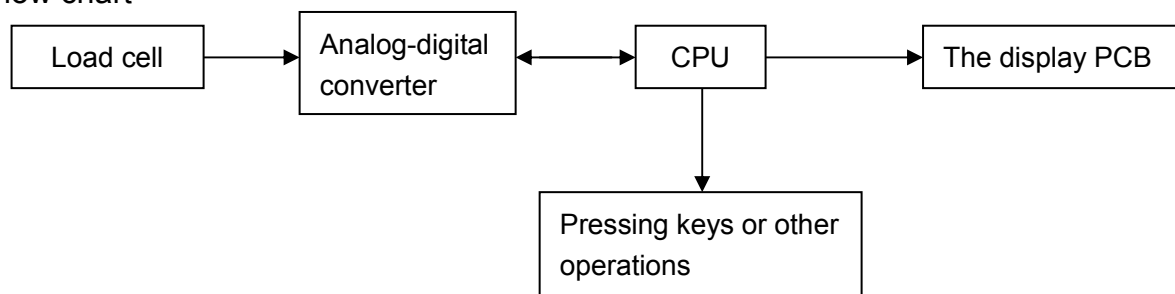
Accuracy of voltage: $\pm 2\%$

Storage Temp.: $-55^{\circ}C$ --- $125^{\circ}C$

Max. Input Voltage: $8.5V$

5. Operating principle

① Flow chart



② Operating principle

When the scale is loaded, the load cell would send a millivolt-sized analog voltage signal refer to the weight of the loading objects. The signal is sent to the A/D converter and converted to be digital signal; this signal together with some operational orders is received and processed by the CPU; at last the display will show corresponding data.

6. Phenomena of trouble

1) Trouble of parts

The phenomena are as following:

- a) Buzzer -----The buzzer doesn't make sound, or sometimes make sound and sometimes doesn't make sound.
- b) Keys -----The keys don't work.
- c) LED ----- The display shows incomplete or exceptional.
- d) Zener Diode-----The scale can't switch on when connecting to the adapter and the AC power indicator doesn't lighten.

2) Trouble of load cell

The phenomena are as following:

- a) The display data doesn't change when the scale is loaded.
- b) The initial internal resolution value is out of its normal range.
- c) The initial internal resolution value drifts.
- d) The display shows "E2" when power on.
- e) The display reading is inaccurate or unstable.

3) Trouble of power supply

The scale can't switch on, or when it switches on, the "Low battery" indication appears.

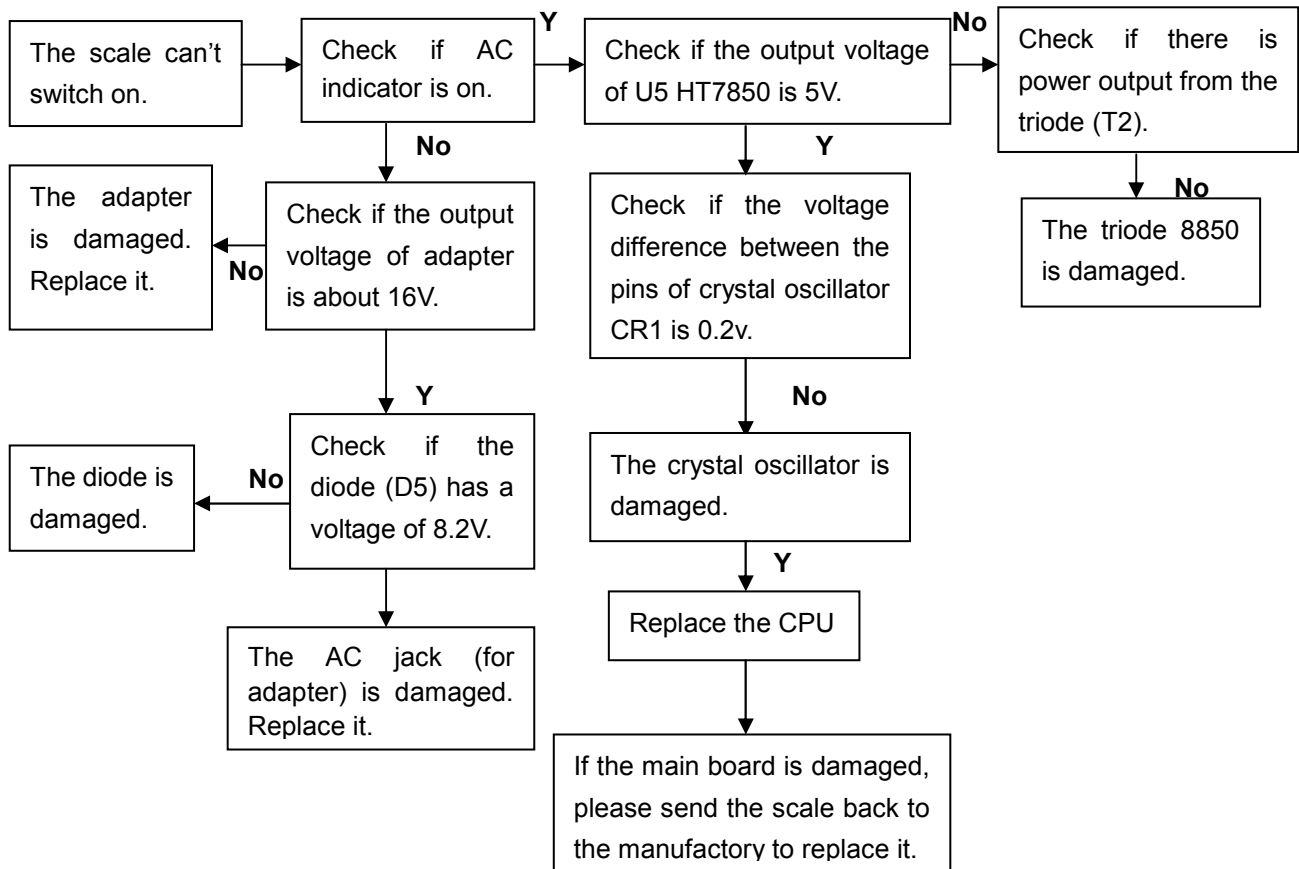
4) Trouble of PCBs

The phenomena are as following:

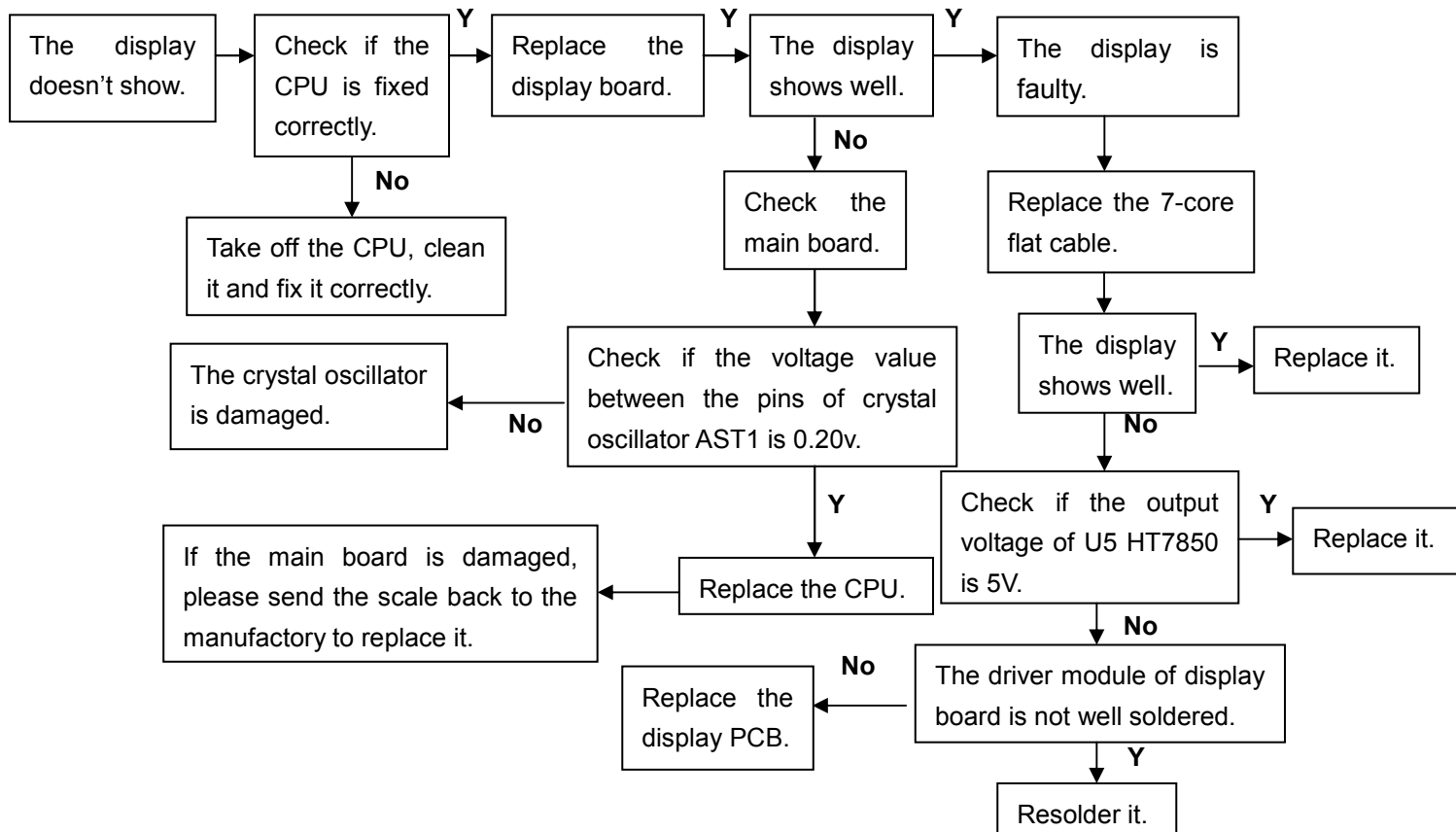
- a) Keyboard----- No sound when pressing a key or the keys don't operate.
- b) Main board----- The scale can't switch on or the display shows nothing when switch it on.
- c) Display board----- The display shows incomplete or exceptional.

7. Solutions to the trouble

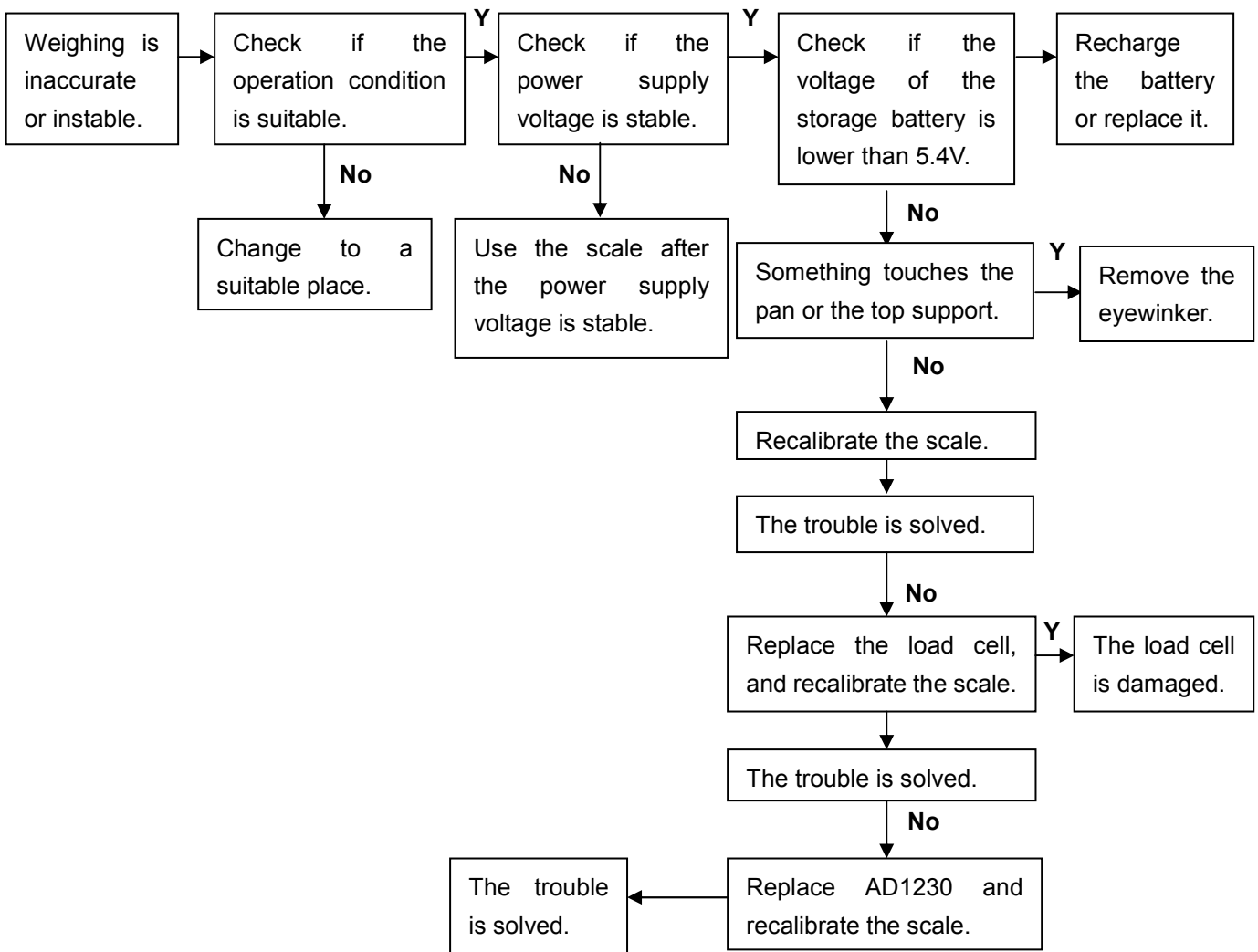
1) The scale can't switch on:



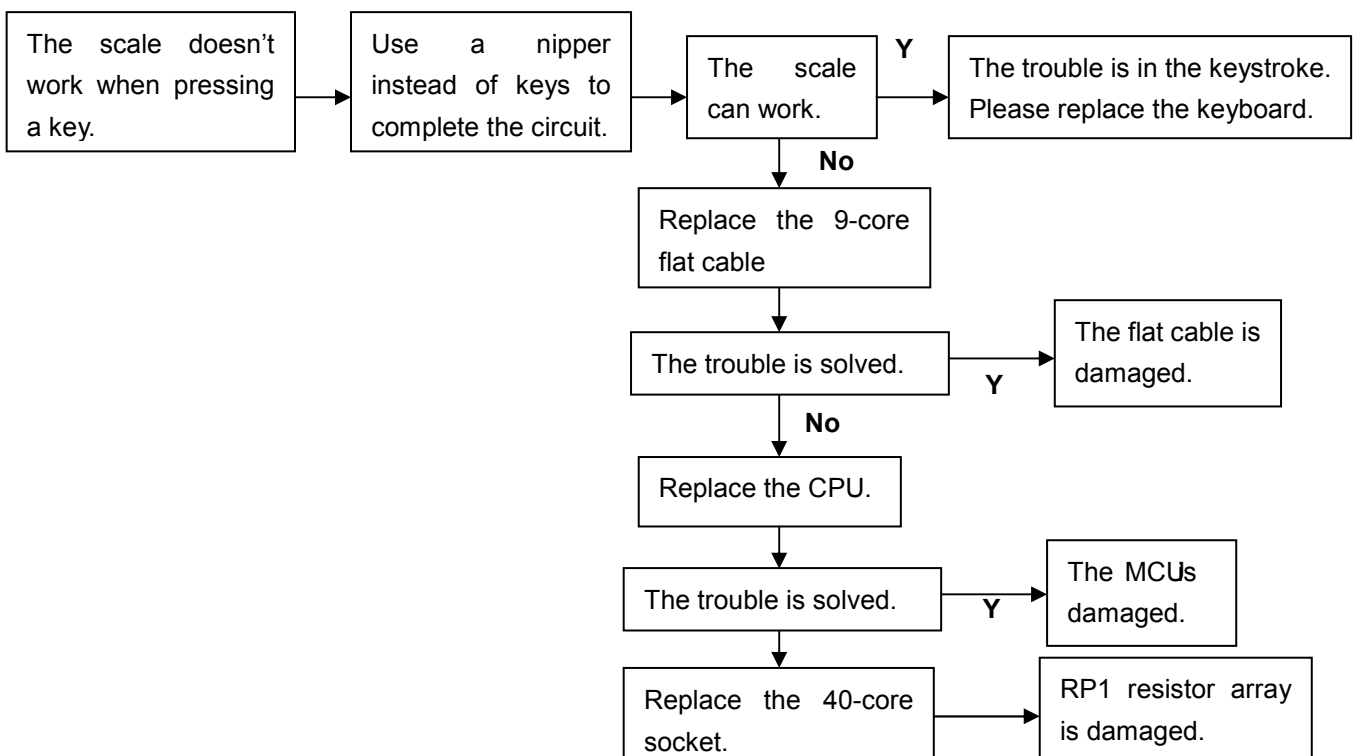
2) The display doesn't show after power on



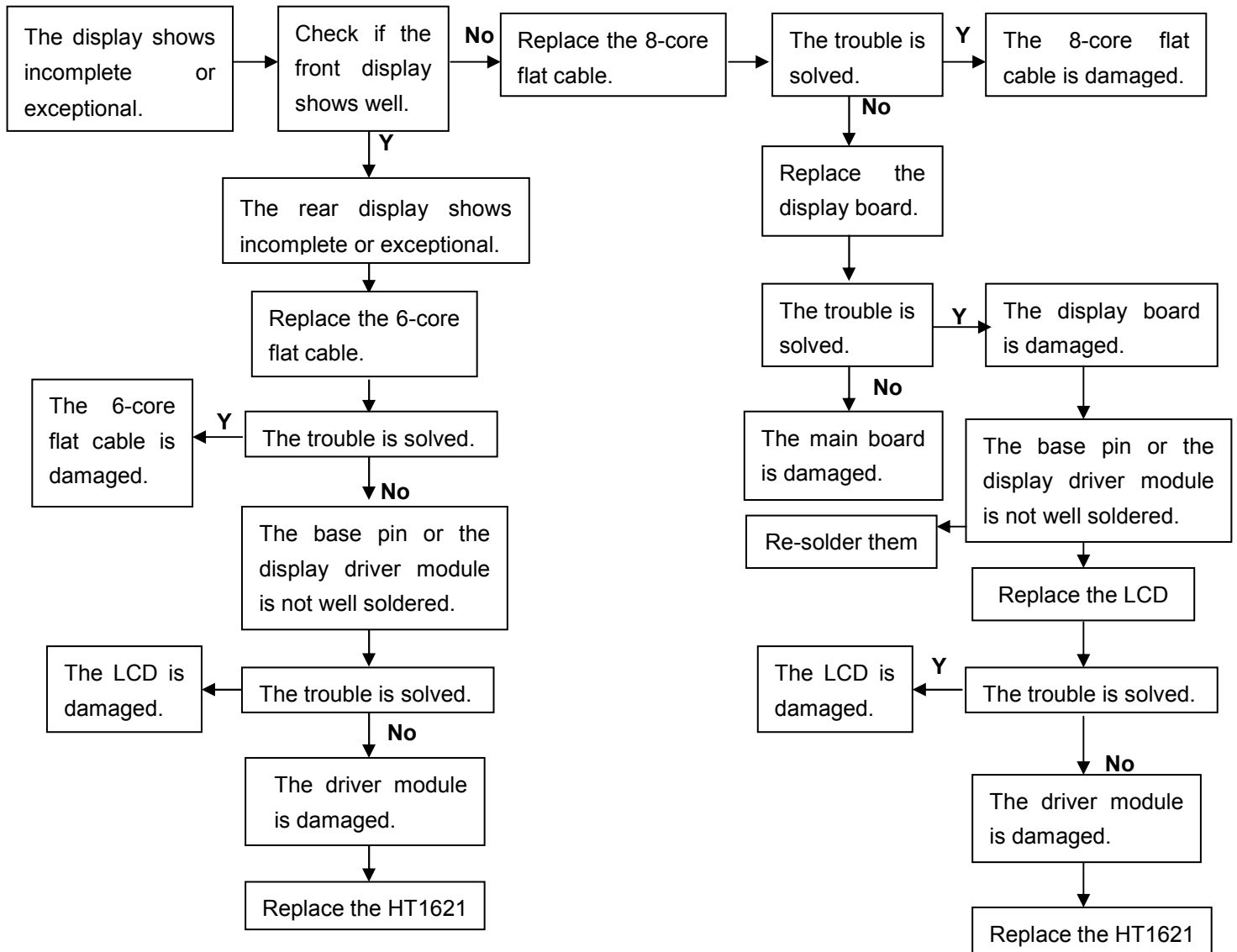
3) Weighing is inaccurate or instable:



4) The keys don't work:



5) The display shows incomplete or exceptional



Note:

Sometimes the scale is affected by its operating condition such as the climatoer temperature; it may show error messages during the operating process.

Error messages		Handling
Err1	EPROM data error.	Recalibrate the scale or replace the CPU and recalibrate.
Err2	The initial zero is outside the range of the factory setting for zero.	Recalibrate the scale or replace the load cell and recalibrate.

8. Calibration Procedure

Switch on the scale, press the Calibration key at the bottom of the scale during the self-checking, and then the scale enters into calibration procedure.

Available units selection (Version selection)

The display shows as below:



Press **Units/ ▲** or **Check-W./ ▼** key to choose **U 0** (Version 1.00) or **U 1** (Version 1.10), then press **Zero/Enter** key to confirm and move to next step.

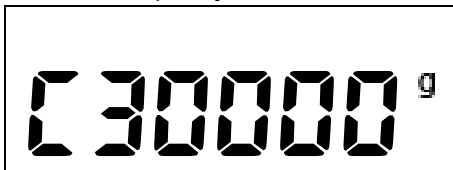
Note:

U 0----kg, g, lb and oz can be available

U 1----kg and g can be available

To choose the Capacity

Then the display shows the capacity:



Press **Units/ ▲** or **Check-W./ ▼** key to change the capacity, which can be chosen from “1200, 1500, 3000, 6000, 7500, 12000, 15000 and 30000”; press **Zero/Enter** key to confirm and move to next step.

To choose the division value

Then the display shows a division value:



Press **Units/ ▲** or **Check-W./ ▼** key to change it which can be chosen from “2400, 3000, 6000, 7500, 12000 and 15000”; press **Zero/Enter** key to confirm and move to next step.

In calibration mode

The display shows as below:



- Press **Zero/Enter** key to confirm the zero point; and then the display shows “0”:



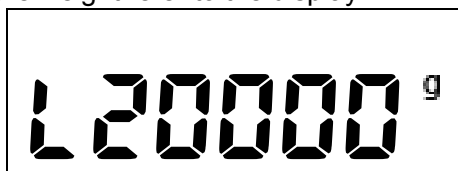
Press **Zero/Enter** key to confirm.

- Then the display shows the calibration weight value for the first time (1/3 of full capacity) which should be put on. Put on the weight refer to the display.



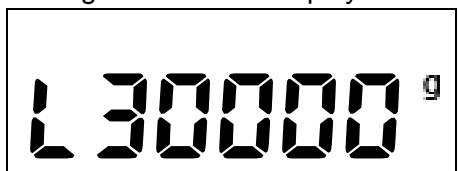
Press **Zero/Enter** key to confirm. The display will show the weight value on the pan and the buzzer will sound.

- Then the display shows the calibration weight value for the second time (2/3 of full capacity) which should be put on. Put on the weight refer to the display.



Press **Zero/Enter** key to confirm. The display will show the weight value on the pan and the buzzer will sound.

- Then the display shows the calibration weight value for the third time (3/3 of full capacity) which should be put on. Put on the weight refer to the display.



Press **Zero/Enter** key to confirm. The display will show the weight value on the pan and the buzzer will sound.

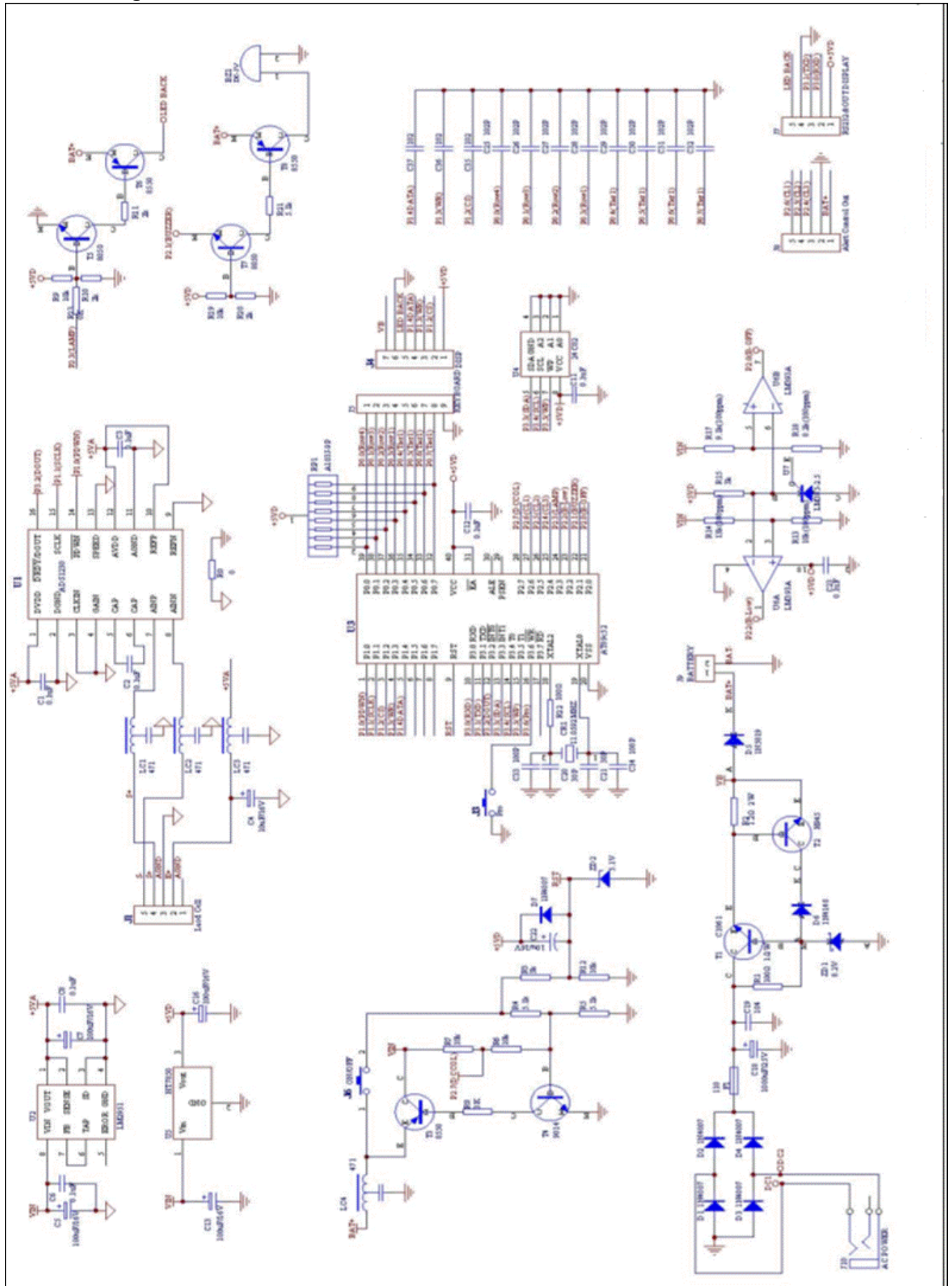
Then the scale returns to normal weighing mode. Take off the weights on the pan and restart the scale, the scale can be used.

Note:

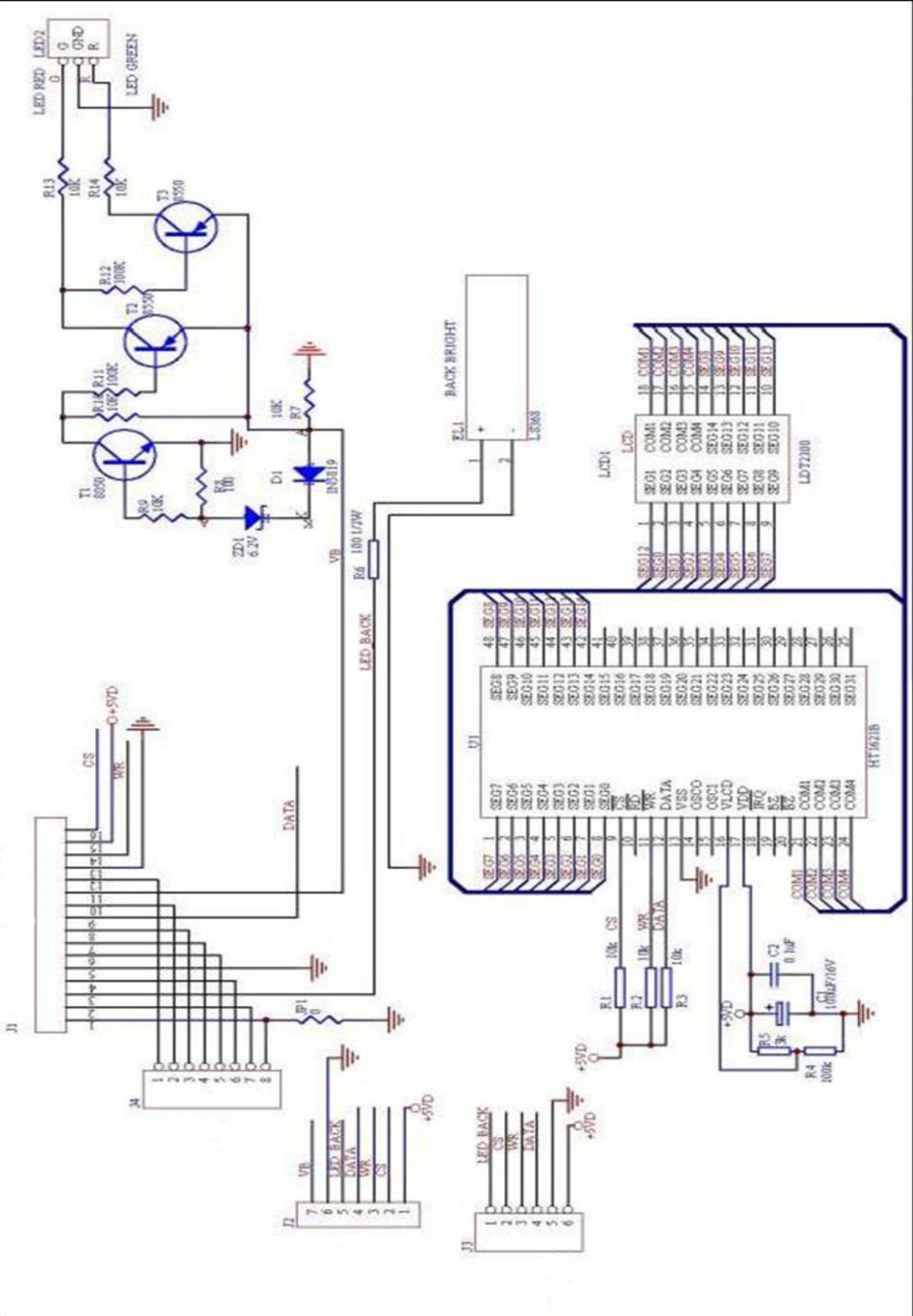
Press **Mode/ ◀** key during the calibration mode to check the internal resolution.

9. Appendix

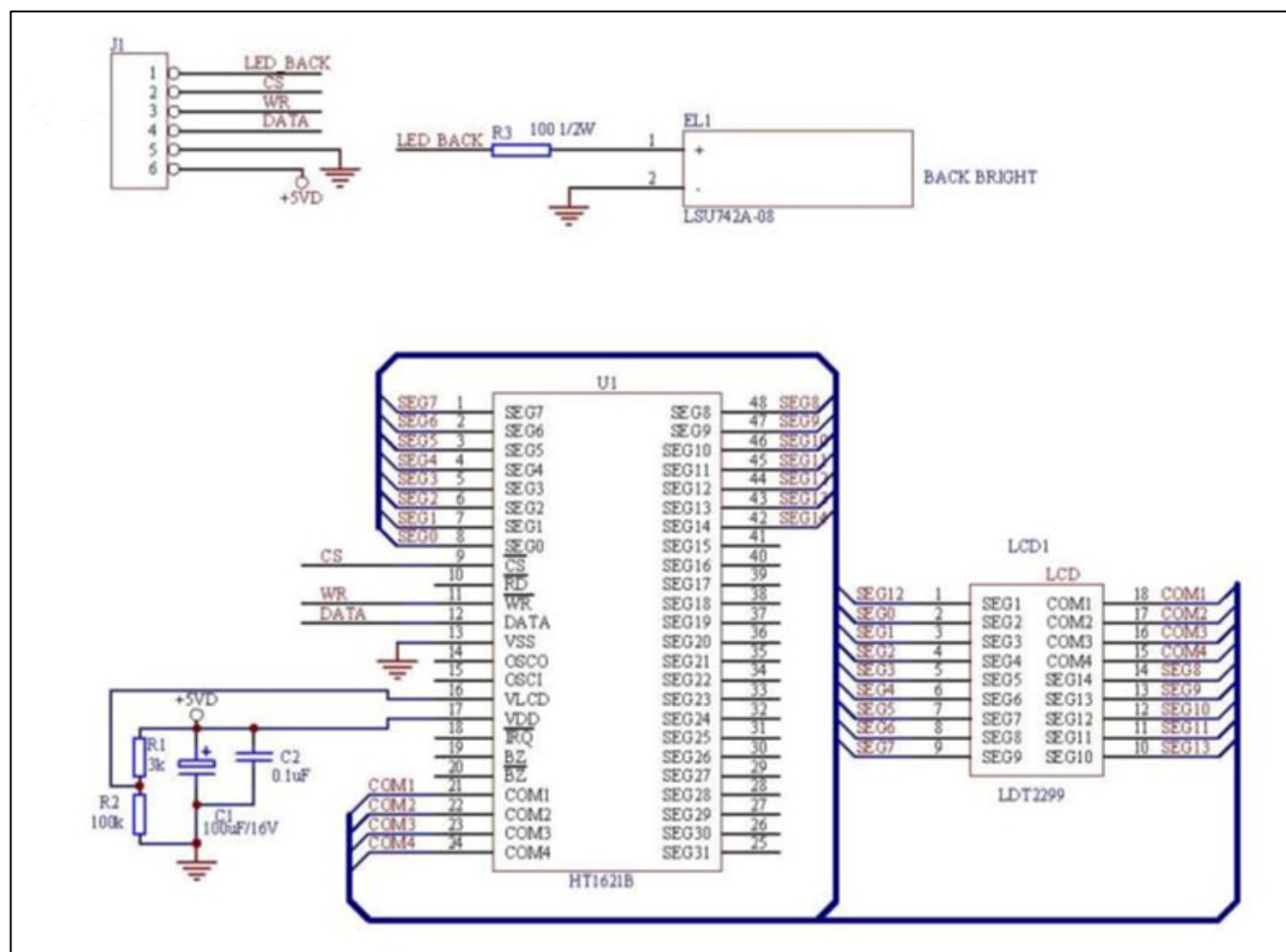
Circuit Diagram for Main PCB



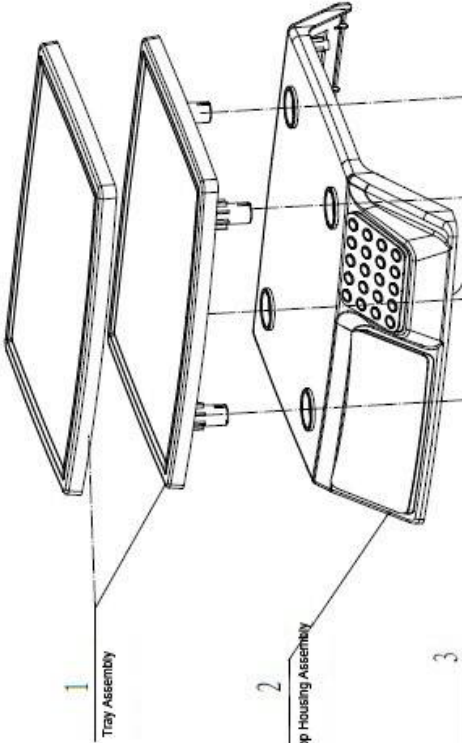
Circuit Diagram for Front Display PCB



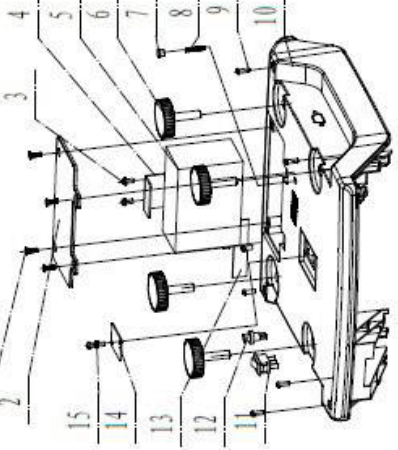
Circuit Diagram for Rear Display PCB



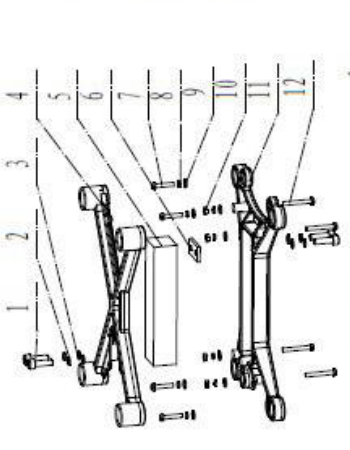
Assembly Drawing



Bottom Housing Assembly				
16	20030014	Level Bubble	1	JS-A/B
15	26050004	Pan Head Screw	2	M3*6mm
14	2012009	Cover for Call Key	1	JS-S/F
13	0210006	Hole Block Patch	1	
12	1810033	Power Socket	1	Ø2.1
11	20030009	On/Off Switch	1	3 Terminals
10	2012002	Bottom Housing	1	JS-S/F
9	26060006	Tapping Screw	5	M3.5*14
8	26090019	Limit Screw	1	M4*25mm
7	20030018	Rubber Seal	1	H=6mm
6	20030033	Levelling Feet	4	JS-A/B
5	2301003	Rechargeable Battery	1	6V/4AH
4	2012009	Flaring Plate	1	JS-S/F
3	26050002	Cheese-Head Bolt	3	M4*8mm
2	2012003	Battery Cover	1	JS-S/F
1	2607007	Counter Sink Screw	4	M4*8mm
No	Item No.	Parts Name	Qty	Specification
Remark				



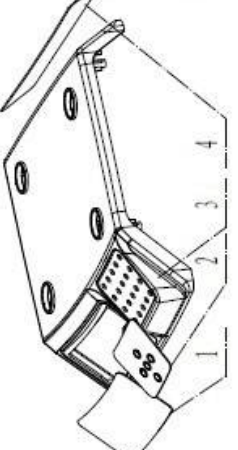
Load Cell Bracket Assembly				
12	26050009	Cheese-Head Bolt	4	M4*35mm
11	2012012	Bottom Support	1	JS-S/F
10	26040002	Nut (HEX)	4	M4
9	26020002	Flat Washer	8	Ø4
8	26030002	Elastic Washer	8	Ø4
7	26050006	Cheese-Head Bolt	4	M4*12mm
6	2010029	Pad for Load Cell	1	30*25*2.0mm
5	19020007	ZEMIC Load Cell	1	
4	2012011	Top Support	1	JS-S/F
3	26020003	Flat Washer	4	Ø6
2	26030003	Elastic Washer	4	Ø6
1	26010005	Socket Head Screw	4	M6*25mm
No	Item No.	Parts Name	Qty	Specification
Remark				



Tray Assembly				
2	2012004	Plastic Pan	1	JS-S/F
1	2012010	Stainless Steel Pan	1	JS-S/F
No	Item No.	Parts Name	Qty	Specification
Remark				



Top Housing Assembly				
4	03088	Back Panel	1	ACS-C
3	2012001	Top Housing	1	JS-S/F
2	03059	Keypad Membrane	1	ACS-C/E
1	03053	Display Overlay (Front)	1	ACS-C
No	Item No.	Parts Name	Qty	Specification
Remark				



Assembly Drawing				
Mark/Co.	Revision No.	Std.	Date	Chengdu PHS Electronic Co., Ltd
Drawn	Standard	Model	W	Scale
Tech	Model	ACS-C	1:2	
Audit				
Appr.				
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