MAINTENANCE MANUAL

PS2 SERIES

CONTENTS

JUNE 2003 REV 4

Specifications and Function Subject to Change without Notice

1. INTRODUCTION

The PS2 series are designed and programmed according to the OIML R-76 Class III requirements.

This indicator is sealed to prevent unauthorized access to internal parts. Ender users should be advised not to undertake any trouble shooting except those listed on the operation manual.

This maintenance manual contains of certain information that may result in fraudulent use. Do not release any part of this manual to any end users or un-authorized persons.

The internal mini jumper should be so set to prevent un-authorized settings or alternations.

If a load cell has been replaced, make sure that the protection devices are properly set.

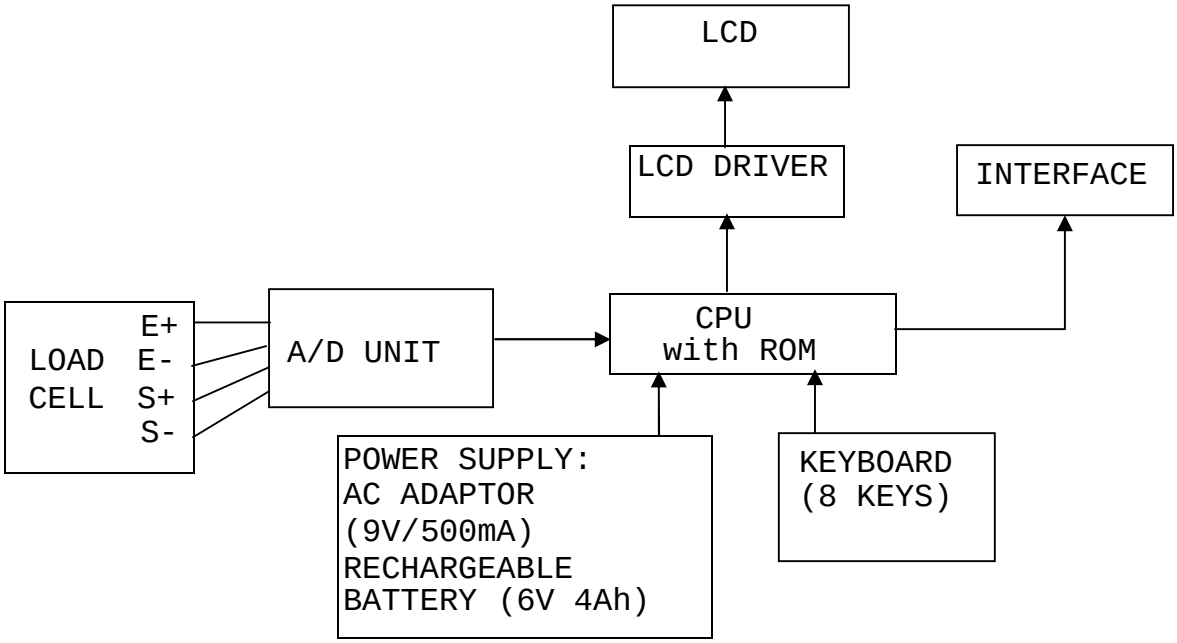
After servicing, it is necessary to go through all tests and procedures to ensure the indicator meets all the meteorological and approval requirements.

Here are some features of the PS2 series

1. Designed to meet OIML-R76 class III requirements.
2. Zero Indicator.
3. Tare Indicator.
4. Negative Value Indicator.
5. Auto Tare Function.
6. Power on Zero Function.
7. Manual Zero Function.
8. Animal Weighing Function.
9. Extended Display Function.
10. Auto Power Saving Function.
11. Metric/Avoirdupois Conversion Function.
12. Huge Size WTN LCD display, 5 ½ x 51mm.
13. Low battery warning signal.
14. 2-points Calibration.
15. Mini jumper to prevent end-user calibration.
16. Optional EL backlights
17. Accumulation function available.
18. Built-in rechargeable battery operated.
19. Battery operating time: 200 hours plus after charged.

2. SPECIFICATION

2.1 SYSTEM BLOCK DIAGRAM



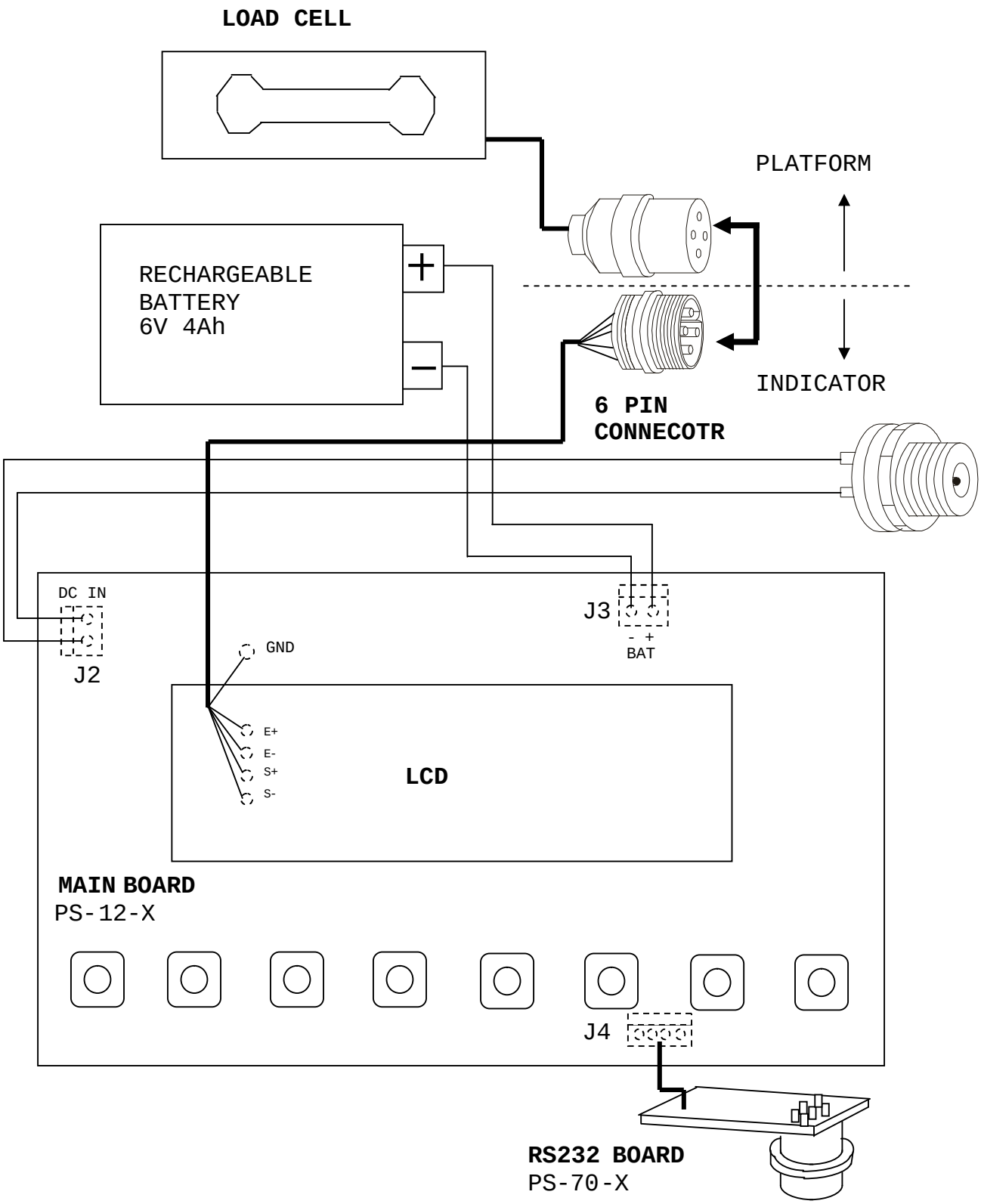
Description:

When a mass is placed on the platform, the load of the article is applied to the load cell inside it.

The resistance to the excitation current in the strain gauge will then changed and the analog output signal varies.

It is amplified and digitized continuously by the A/D converter into a digital signal. Subsequently, the resulting count is processed and managed by the CPU. The CPU refers to the instructions from the keyboard, and then conveys the output data to LCD driver, which formats the data into readout on the display panels.

2.2 PHYSICAL LAYOUT OF ELECTRICAL CONNECTION



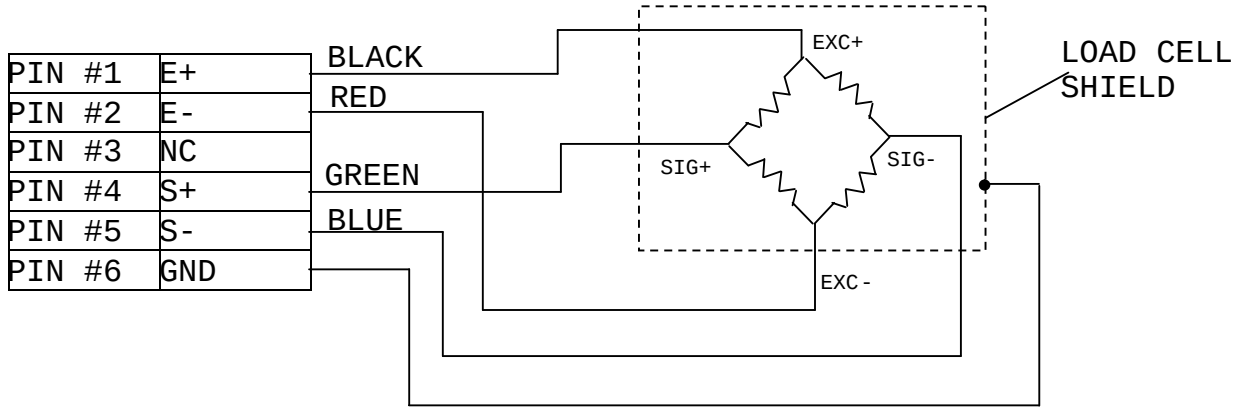
2.2.1 CONNECTION BETWEEN INDICATOR AND PLATFORM (6 PIN ROUND CONNECTOR)

PIN ASSIGNMENT

INDICATOR

PIN #1	E+
PIN #2	E-
PIN #3	NC
PIN #4	S+
PIN #5	S-
PIN #6	GND

PLATFORM



2.2.2 CONNECTION OF RS-232 BETWEEN INDICATOR AND PC(6 PIN ROUND CONNECTOR ←→ 9 PIN D-SUB)

PIN ASSIGNMENT

INDICATOR(6PIN CONNECTOR)

PIN #1	RXD
PIN #2	DSR
PIN #3	DTR
PIN #4	DCD
PIN #5	TXD
PIN #6	GND

PC(9PIN D-SUB)

PIN #1	DCD
PIN #2	TXD
PIN #3	RXD
PIN #4	DTR
PIN #5	GND
PIN #6	DSR
PIN #7	RTS
PIN #8	CTS
PIN #9	NC

** RTS & CTS has been shorted internally.

BAUD RATE : 9600

DATA BIT : 8

PARITY BIT : N(NONE)

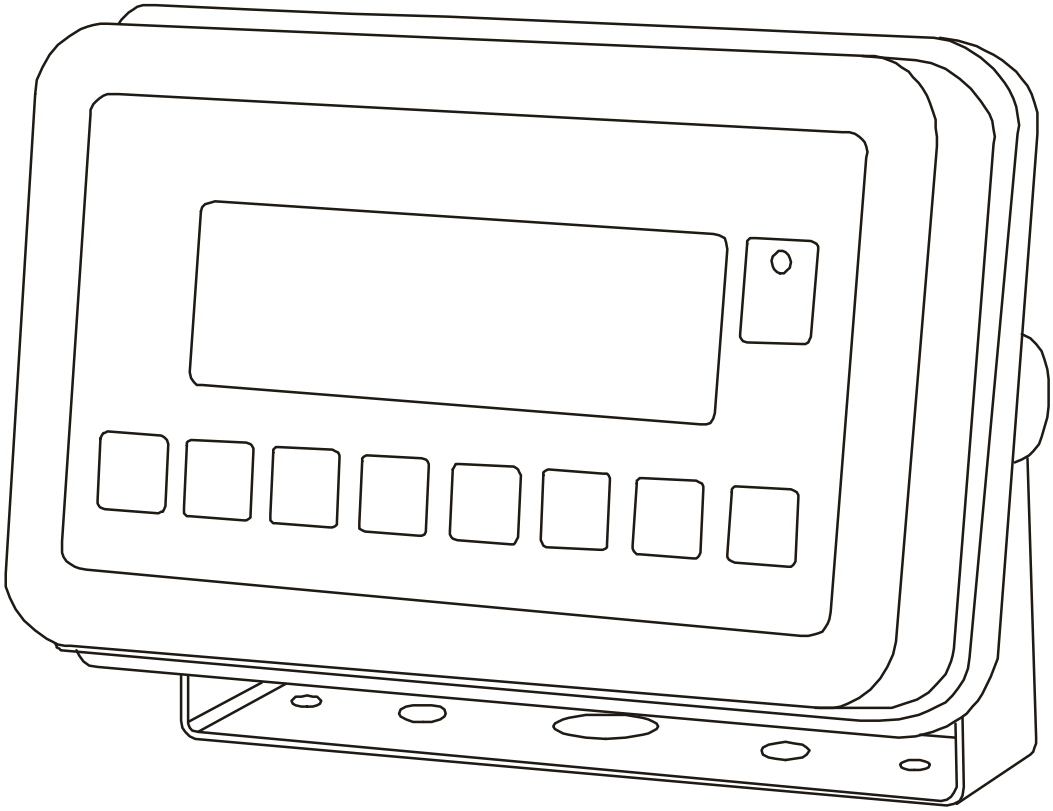
STOP BIT : 1

CODE : ASCII

Press M+ to output a reading of transaction.
Press MC to output the total of readings.

2.3 GENERAL SPECIFICATION

2.3.1 Overall View



2.3.2 Overall Dimension:

215(W) x 150(H) x 90(D)mm

2.3.3 Model Specifications

Model No.	Capacity (Max)	Division (e)		Platform
		OIML	Non-OIML	
PS2-6	6kg	0.002kg	0.001kg	All Stainless Steel 280 x 330mm
PS2-15	15kg	0.005kg	0.002kg	
PS2-30	30kg	0.01kg	0.005kg	
PS2-B30	30kg	0.01kg	0.005kg	All Stainless Steel 330 x 450mm
PS2-B60	60kg	0.02kg	0.01kg	
PS2-B150	150kg	0.05kg	0.02kg	
PS2-6II	6kg	0.002kg	0.001kg	All Stainless Steel Load Cell & Load Receiving Structure 280 x 330mm
PS2-15II	15kg	0.005kg	0.002kg	
PS2-30II	30kg	0.01kg	0.005kg	
PS2-B30II	30kg	0.01kg	0.005kg	All Stainless Steel Load Cell & Load Receiving Structure 330 x 450mm
PS2-B60II	60kg	0.02kg	0.01kg	
PS2 indicator	User Define	1/3000	1/30000	User Define
Class	III			
Maximum Tare Range	OIML= 1/3 Max – e; Non-OIML= Full Range			
Power on Zero Range	±10%			
Manual Zero Range	±2%			
Minimum Load	20e			
Operation Environment	0^{o}~40^{o}C (32^{o}~104^{o}F), Non-condensed. R.H.≦ 85%			

Power Consumption	0.1W

2.3.4 Main Components Used

Microprocessors: SM8958
Crystal Oscillator: 11.0592MHz
Display Device: WTN Liquid Crystal Display

2.3.5 Analog Specification

- Input sensitivity: 0.96mV/V~1.8mV/V VS. Full Capacity
- A/D Conversion Speed: 10 times/second
- Minimum signal voltage per verification scale interval is 1.5 μV;
- 16 bits serial digital output;
- Excitation power supply for the load cell is 5 V DC;
- Minimum input impedance of the load cell is 85 Ω;
- Maximum cable length for the connection between the indicator and the junction box or load cells (when more then one load cell is connected) is 1 m/mm^2.

2.4 INTERNAL SETTINGS AND CALIBRATION METHODS

The PS2 indicator is designed to have no preset capacity and division, but for user to define. Depends on the requirement and the purpose of the indicator is operating under, the resolution can be set anywhere from 1/3000 to 1/30000.

When **oiml** mode is selected and application is legal for trade, the overall resolution will be limited to 1/3000 with extended display for reference. When **norm** mode is selected and application is not legal for trade, the overall resolution can be set to a maximum of 1/30000. The indicator also can be set to have dual intervals when parameter is input.

TO SET TYPE (Select between OIML and non OIML application)

a. Indicator is off
b. Press and hold **TARE**, then press **ON**
c. Indicator displays **F.1**
d. Press **TARE** until indicator displays **F.3**
e. Press **MODE** to enter

f. Indicator displays **TYPE**
g. Press **M+** to enter and select desire operating type between **oiml** or **norm** for normal
h. Press **MODE** to confirm

TO SET WEIGHING UNIT

i. After **TYPE** is confirmed, indicator will display **unit**
j. Press **M+** to select the weighing units of kg, g, lb/kg, lb/g
   - To enable the avoirdupois units, press **MODE** when the lb/kg or lb/g sign appears.
   - To disable the avoirdupois units, press **MODE** when the kg or g sign appears.

TO SET DECIMAL POINT (For capacity and division readings)

k. After **unit** is confirmed, indicator will display **dp**
l. Press **M+** to select number of decimal place. It can be set from no decimal place up to 4 decimal place
m. When selected, press **MODE** to confirm

TO SET RATED CAPACITY AND DIVISION

(For Single interval, it means Max x e; for Dual Interval, it means Max_2 x e_2)

n. After decimal place is confirmed, indicator will display **CAP2**
o. Press **M+** to enter and utilize **M+** to increase value, **MR** to move cursor forward and **MC** for backward.
p. The division must be selected to complete the setup before proceed to the next selection
q. Press **MODE** to confirm

TO SET DUAL INTERVAL (Max_1 x e_1)

r. After capacity and division is set, indicator will display **CAP1?** If dual interval does not require, press **MODE** to skip to **F4** to complete the internal setup. However, if dual interval is required, press **M+** to enter and utilize **M+, MR** and **MC** to set the capacity and division.
s. Press **MODE** to confirm and follow by **ZERO** to quit

NOTE 1: You must reset capacity every time when you change the type between OIML and NORMAL.

NOTE 2: Each range must not exceed 1/3000 and 1/6000 for overall capacity under OIML mode and 1/30000 for NORMAL mode. For

example, if **CAP2** sets as 3000kg (max2) x 1kg (e2), then **CAP1?** can set as 1500kg (max1) x 0.5kg (e1). So for OIML, max1/e1 & max2/e2 will not exceed 1/3000 and max2/e1 will not exceed 1/6000. For NORMAL, max2/e1 must not exceed 1/30000.

NOTE 3: When **OIML** type is selected, indicator will automatically regulate user to program the resolution within 1/3000.

NOTE 4: When setting up capacity, user must program all digits including division before press **MODE** to confirm.

CALIBRATION METHODS

a. Indicator is off
b. Press and hold **MODE**, then press **ON** Indicator displays **CAL._1**
c. Press **MODE** for **YES** and indicator will self calibrate zero point before proceed to the first point calibration
d. Indicator will show “Load XXXX”, for which XXXX is 1/3 of the full capacity. Load the weight according to the display
e. Press **MODE** when display is flashing
f. Indicator displays **CAL._2**
g. Press **MODE** for **YES** or **ZERO** to exit
h. Indicator will show “Load YYYY”, for which YYYY is 2/3 of the full capacity. Load the mass according to the display
i. After weight is placed, press **MODE** when display is flashing to complete the calibration procedures

ODD WEIGHT CALIBRATION

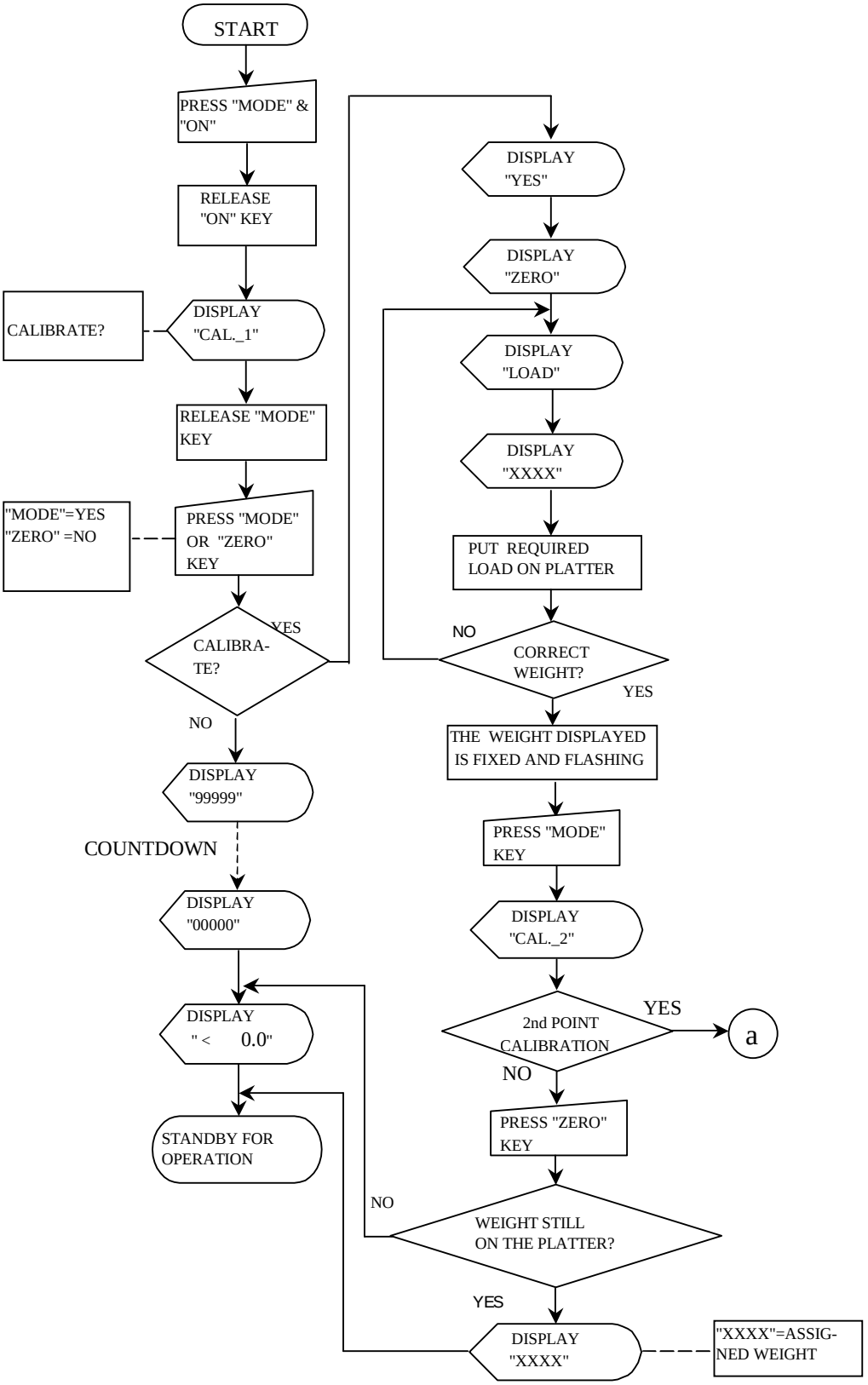
a. Indicator is off
b. Press and hold **TARE**, then press **ON**
c. Indicator displays **F.1**
d. Press **MODE** to enter and indicator will show offset value
e. Press **MODE** again and indicator displays **CAL._1**
f. Press **M+** and manually enter the weight that intends to calibrate by utilize **M+** to increase and **MR** to move cursor
g. When the weight is set, press **MODE** to begin the calibration and scale will self calibrate zero point before proceed to the first calibrate weight that was manually entered
h. Load the mass according to the display
i. Press **MODE** when display is flashing

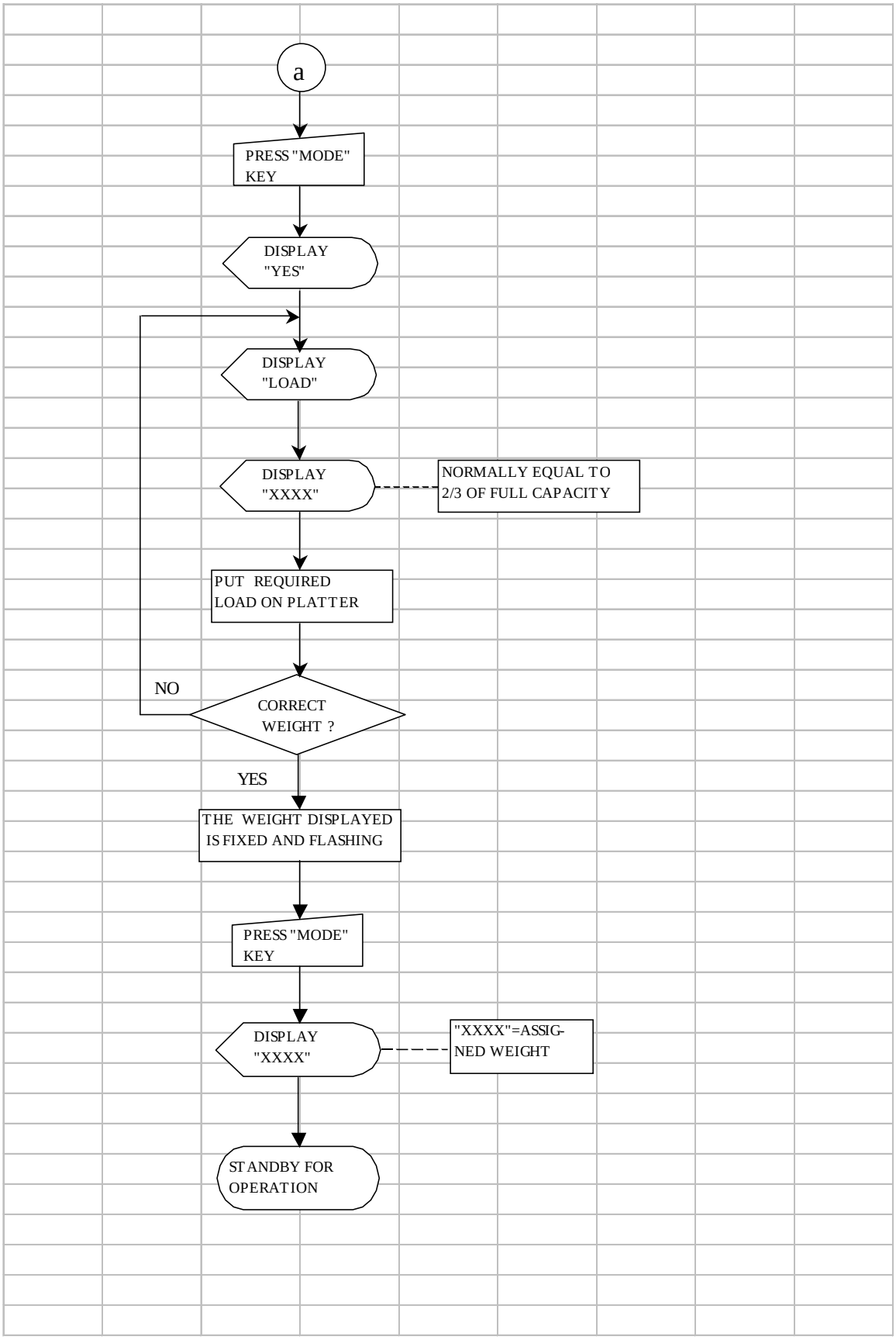
j. Indicator displays **CAL._2**
k. Press **MODE** for **YES** or **ZERO** to exit
l. Repeat step **f** to set the weight of second calibration point.
m. Load the mass according to the display, the second point has to be higher than first point
n. Load the mass according to the display. Press **MODE** when display is flashing to complete the calibration procedures

Note: When manually enter the weight for calibration, the first point must not be less than 1/6 of the full capacity. The second point must not be less than the first point. But it is highly recommend setting the second point at about 2/3 of the full capacity.

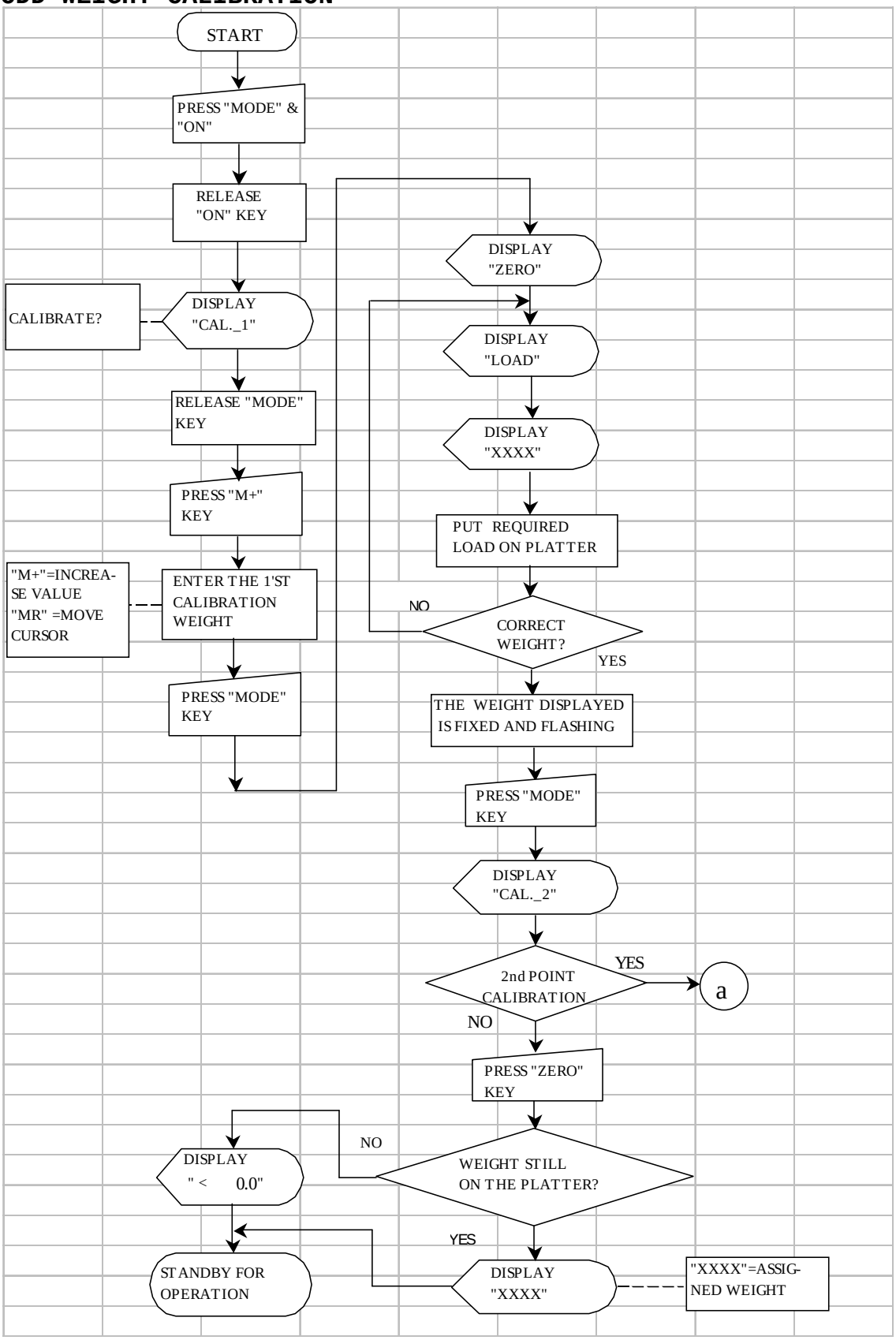
2.5 FLOW CHART

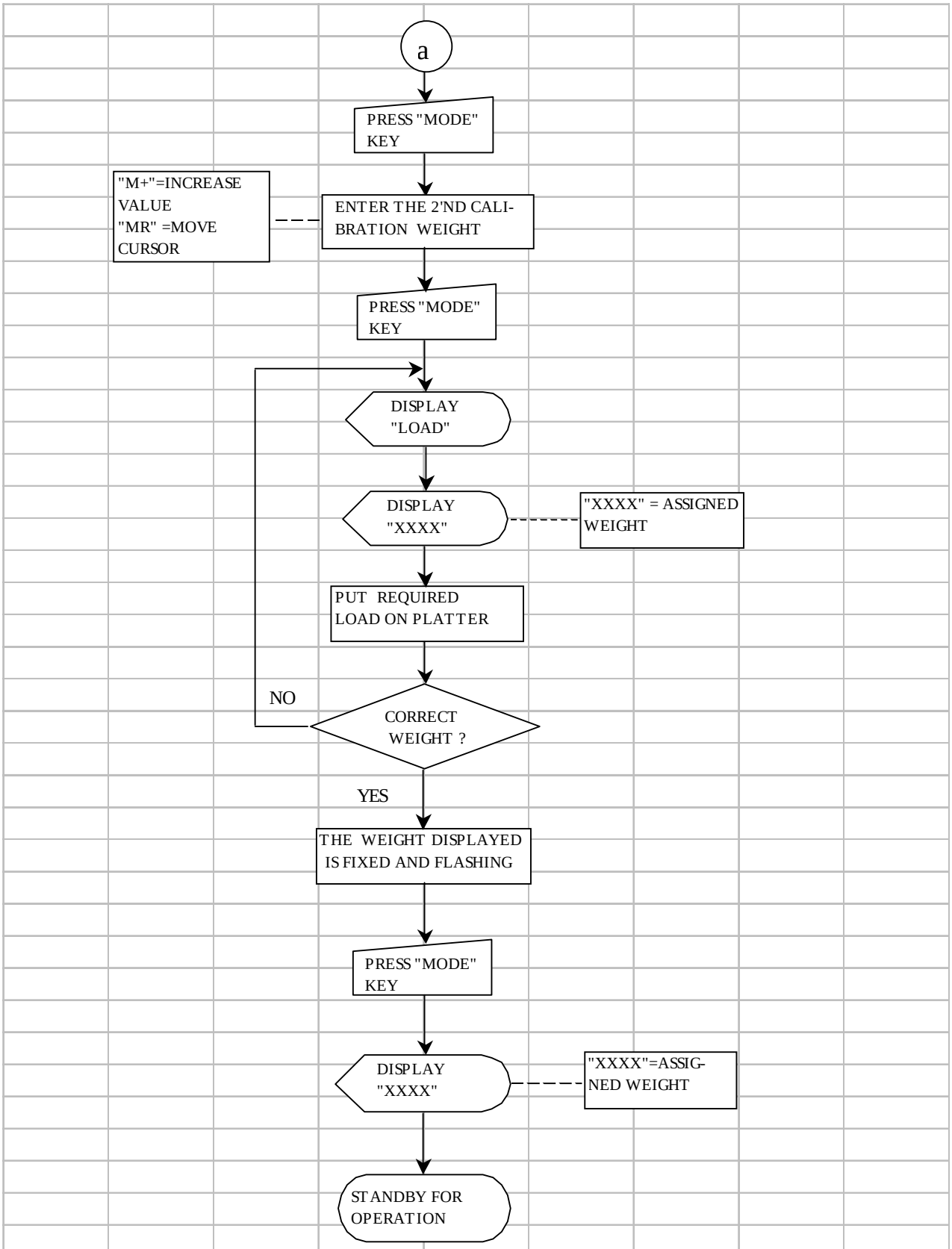
2.5.1 Auto Calibration (for end-user)



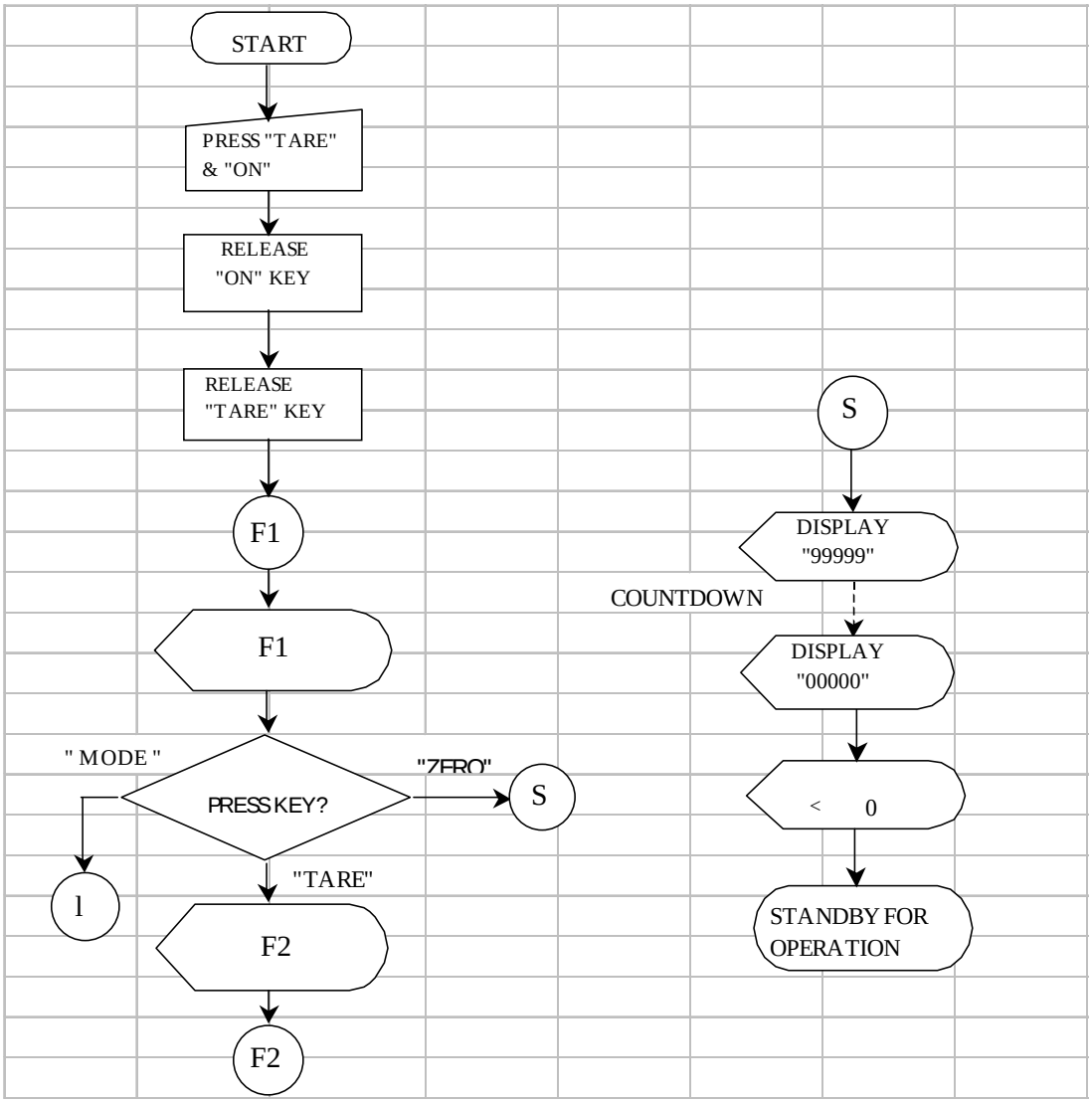

a
PRESS "MODE" KEY
DISPLAY "YES"
DISPLAY "LOAD"
DISPLAY "XXXX"
NORMALLY EQUAL TO 2/3 OF FULL CAPACITY
PUT REQUIRED LOAD ON PLATTER
NO
CORRECT WEIGHT ?
YES
THE WEIGHT DISPLAYED IS FIXED AND FLASHING
PRESS "MODE" KEY
DISPLAY "XXXX"
"XXXX"=ASSIG-NED WEIGHT
STANDBY FOR OPERATION

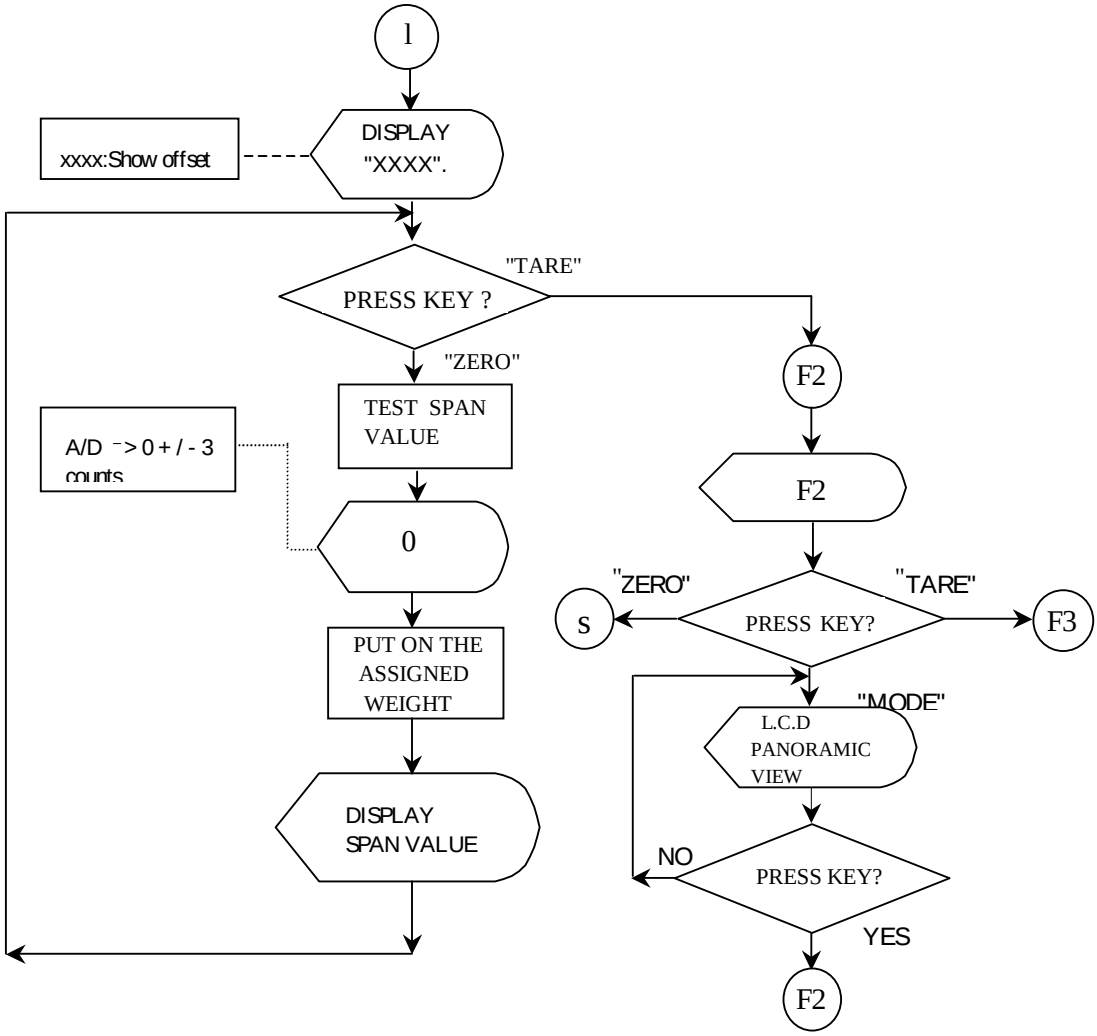
ODD WEIGHT CALIBRATION

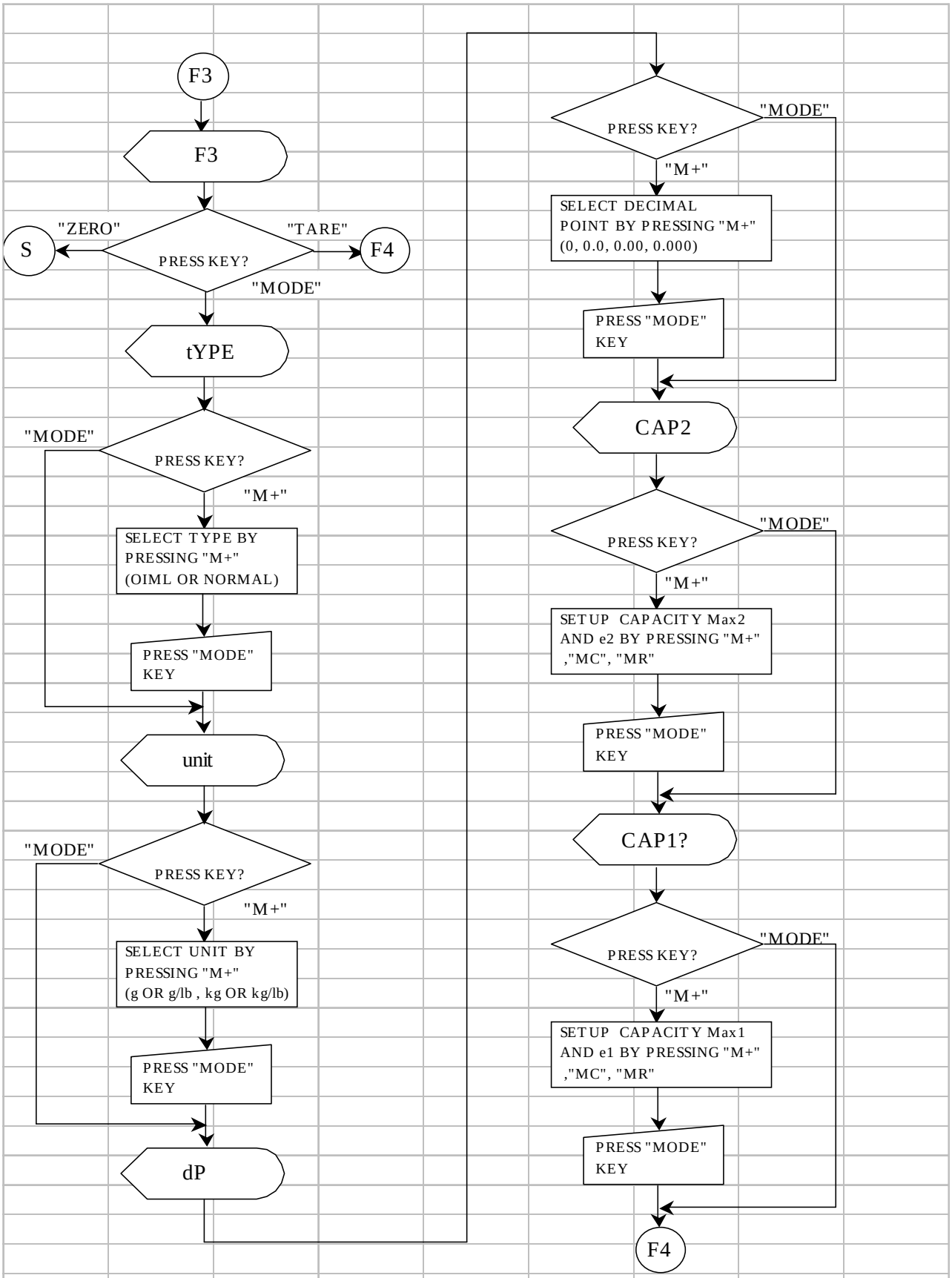


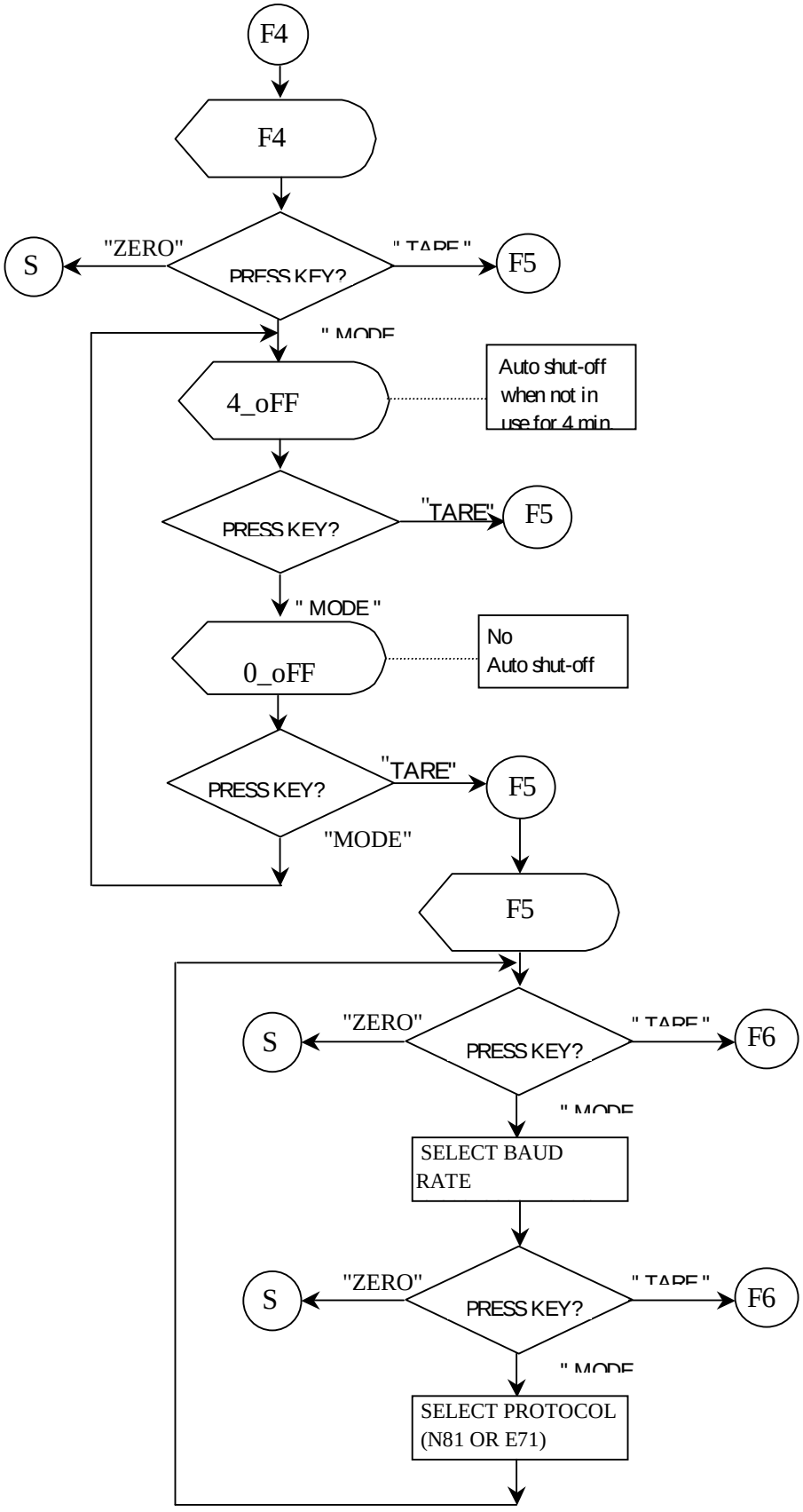

a
PRESS "MODE" KEY
"M+"=INCREASE VALUE
"MR" =MOVE CURSOR
ENTER THE 2'ND CALI-BRATION WEIGHT
PRESS "MODE" KEY
DISPLAY "LOAD"
DISPLAY "XXXX"
"XXXX" = ASSIGNED WEIGHT
PUT REQUIRED LOAD ON PLATTER
NO
CORRECT WEIGHT ?
YES
THE WEIGHT DISPLAYED IS FIXED AND FLASHING
PRESS "MODE" KEY
DISPLAY "XXXX"
"XXXX"=ASSIG-NED WEIGHT
STANDBY FOR OPERATION

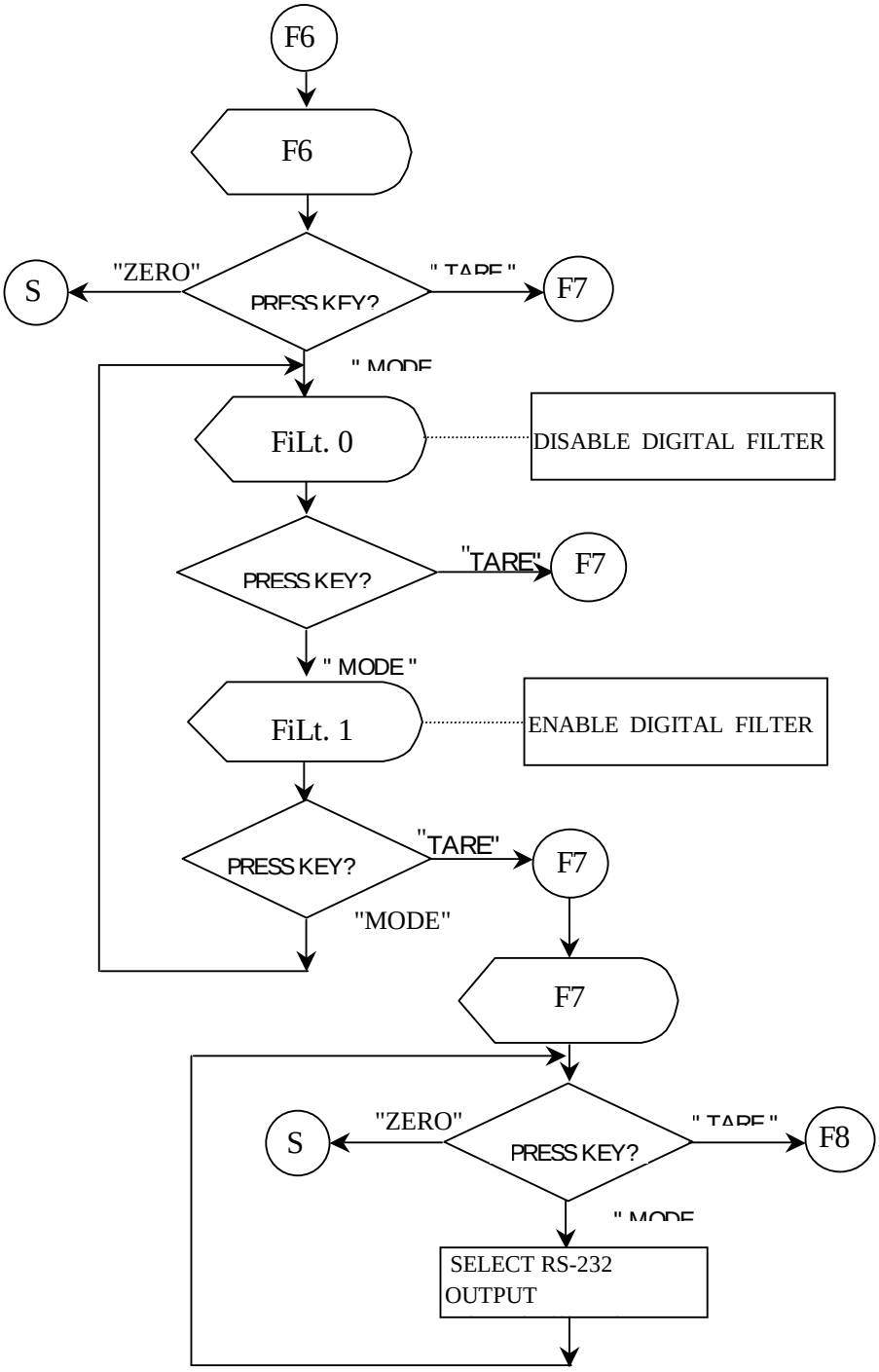
2.5.2 Function Test (for technicians only)

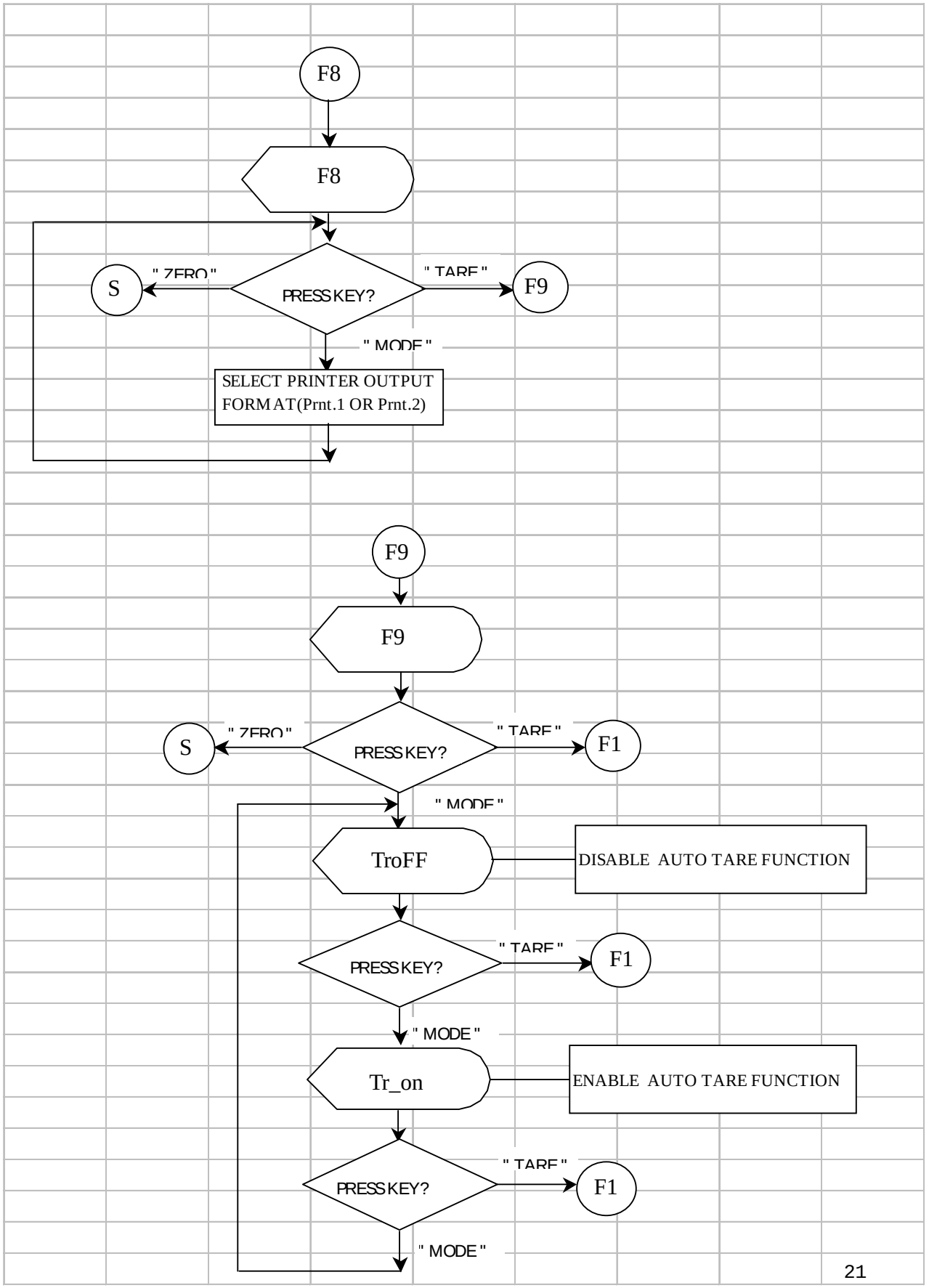



1
DISPLAY
"XXXX".
xxxx:Show offset
"TARE"
PRESS KEY ?
"ZERO"
TEST SPAN
VALUE
A/D -> 0 + / - 3
counts
0
PUT ON THE
ASSIGNED
WEIGHT
DISPLAY
SPAN VALUE
F2
F2
"ZERO"
"TARE"
S
PRESS KEY?
F3
"MODE"
L.C.D
PANORAMIC
VIEW
NO
PRESS KEY?
YES
F2


F3
F3
"ZERO"
"TARE"
S
PRESS KEY?
F4
"MODE"
tYPE
"MODE"
PRESS KEY?
"M+"
SELECT TYPE BY PRESSING "M+" (OIML OR NORMAL)
PRESS "MODE" KEY
unit
"MODE"
PRESS KEY?
"M+"
SELECT UNIT BY PRESSING "M+" (g OR g/lb , kg OR kg/lb)
PRESS "MODE" KEY
dP
PRESS KEY?
"MODE"
"M+"
SELECT DECIMAL POINT BY PRESSING "M+" (0, 0.0, 0.00, 0.000)
PRESS "MODE" KEY
CAP2
PRESS KEY?
"MODE"
"M+"
SETUP CAPACITY Max2 AND e2 BY PRESSING "M+" ,"MC", "MR"
PRESS "MODE" KEY
CAP1?
PRESS KEY?
"MODE"
"M+"
SETUP CAPACITY Max1 AND e1 BY PRESSING "M+" ,"MC", "MR"
PRESS "MODE" KEY
F4

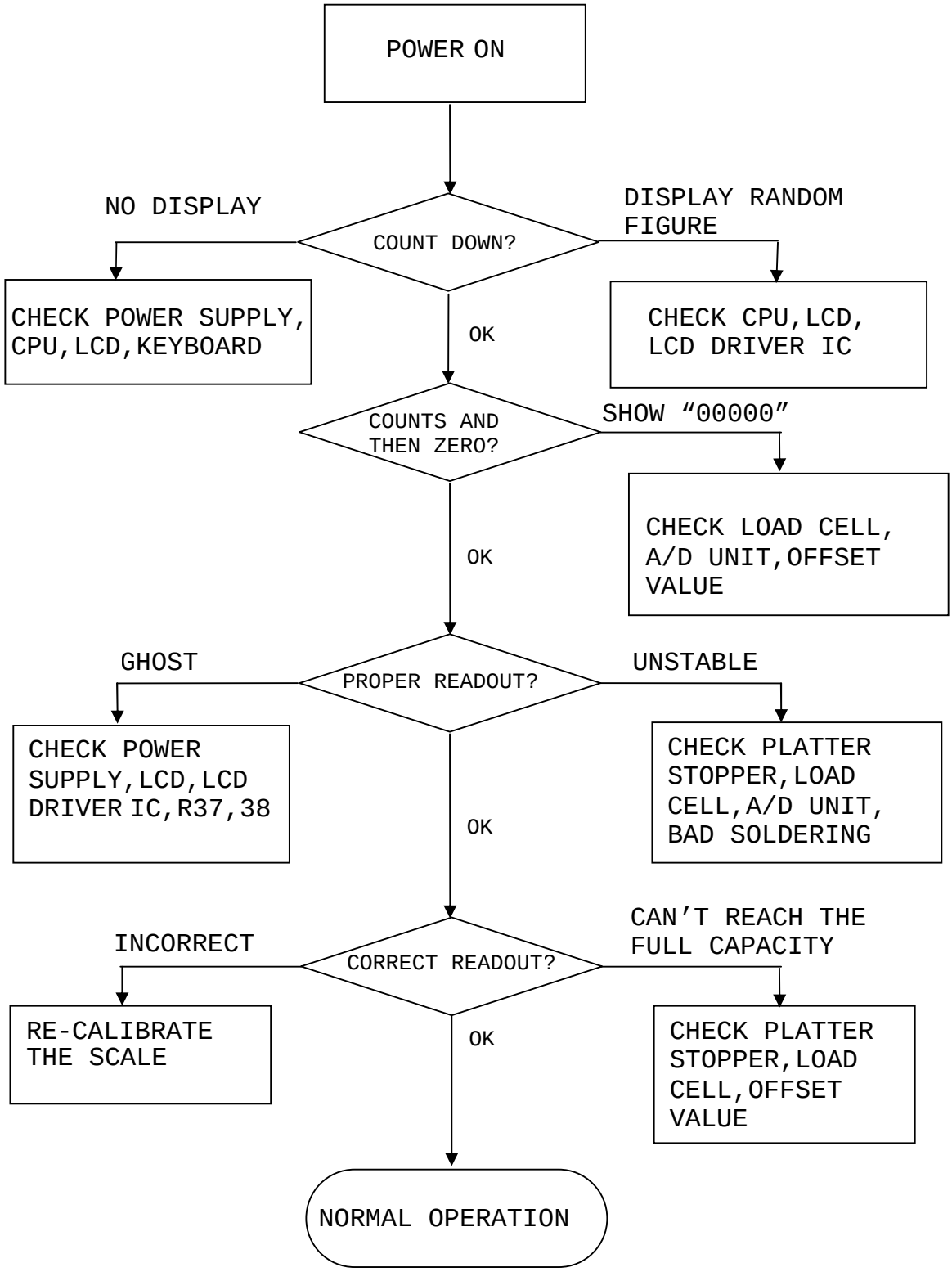

F4
F4
"ZERO"
PRESS KEY?
" TARE "
S
F5
" MODE "
4_oFF
Auto shut-off when not in use for 4 min
PRESS KEY?
"TARE"
F5
" MODE "
0_oFF
No Auto shut-off
PRESS KEY?
"TARE"
F5
"MODE"
F5
"ZERO"
PRESS KEY?
" TARE "
S
F6
" MODE "
SELECT BAUD RATE
"ZERO"
PRESS KEY?
" TARE "
S
F6
" MODE "
SELECT PROTOCOL (N81 OR E71)


F6
F6
"ZERO"
PRESS KEY?
" TARE "
S
F7
" MODE "
FiLt. 0
DISABLE DIGITAL FILTER
PRESS KEY?
"TARE"
F7
" MODE "
FiLt. 1
ENABLE DIGITAL FILTER
PRESS KEY?
"TARE"
F7
"MODE"
F7
"ZERO"
PRESS KEY?
" TARE "
S
F8
" MODE
SELECT RS-232
OUTPUT


F8
F8
" ZERO "
S
PRESS KEY?
" TARE "
F9
" MODE "
SELECT PRINTER OUTPUT FORMAT(Prnt.1 OR Prnt.2)
F9
F9
" ZERO "
S
PRESS KEY?
" TARE "
F1
" MODE "
TroFF
DISABLE AUTO TARE FUNCTION
PRESS KEY?
" TARE "
F1
" MODE "
Tr_on
ENABLE AUTO TARE FUNCTION
PRESS KEY?
" TARE "
F1
" MODE "

3. TROUBLE SHOOTING

3.1 TROUBLE SHOOTING LOOP

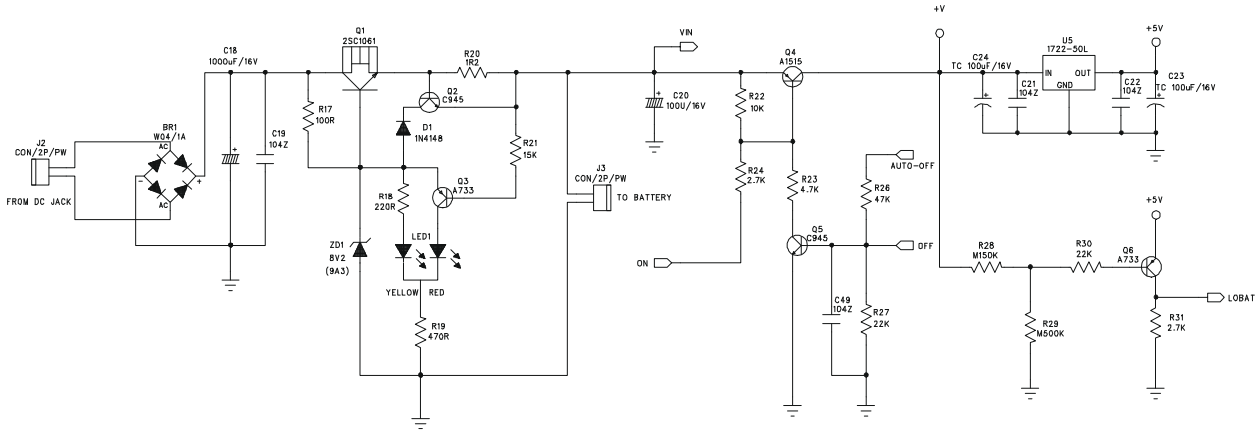


3.2 PARTS AND COMPONENTS TROUBLE SHOOTING

3.2.1 Power Supply Checking

3.2.1.1 Relevant parts:

Main Board (PS-12-X)
Q4 (A1515)
Q6 (A733)
U5(AIC 1722-5.0)
Q1 (C1061)
Q2 (C945)
ZD1(ZENER 8.2V)
R20(1.2R 1/2W)
DC JACK
BATTERY(6V 4Ah)



Description:

1) Power source: Rechargeable Battery 6V/4Ah or AC adaptor(9V, 500mA)

2) +5V power drives digital circuit system.
   U5 (AIC 1722-5.0) is a 5volts Voltage Regulator.

3) +5V power drives analog circuit system.
   U4 (AS2950A) is a 5volts Voltage Regulator.

4) Auto-off:
   If the scale is set with 4_oFF of power-saving function or under LO-BAT situation, after fixed time interval, CPU will release a low potential signal to draw U5 down, then Q4 cuts off, scale will be shut down immediately.

5) Low Power Detection:
The Q6(A733) is designed to detect the power level. When battery power is less than 5.5V, the collector pole will become high potential, then CPU will instruct LCD display to show LO-BAT symbol.

3.2.1.2 Input voltage: 5.5V or higher
Check and recharge battery if voltage is less than 5.5V.

3.2.1.3 System voltage (Vcc): 5V +/- 10%
Check that the system voltage is within 5V +/- 10%
a) less than 4.5V, the CPU may not work properly.
b) more than 6V, ghost will appear on LCD.

3.2.2 Platter Stopper Checking
The platter device shall not touch anything around itself during operation. Check that the platter is not contacted with the upper (no load) and/or lower (with load) stopper.

3.2.3 LCD Display Checking

3.2.3.1 Check that it is soldered and connected properly between LCD and driver IC (PCF8576), driver IC (PCF8576) and CPU.

3.2.3.2 Check whether LCD is broken.

3.2.4 CPU Checking

3.2.4.1 Check that all pins are seated properly into the socket.

3.2.4.2 Check that the Crystal Oscillator works.

3.2.4.3 Check the RESET is normally low.

3.2.5 A/D Unit Checking

3.2.5.1 Check that the +5V powers are correctly fed to the A/D unit.

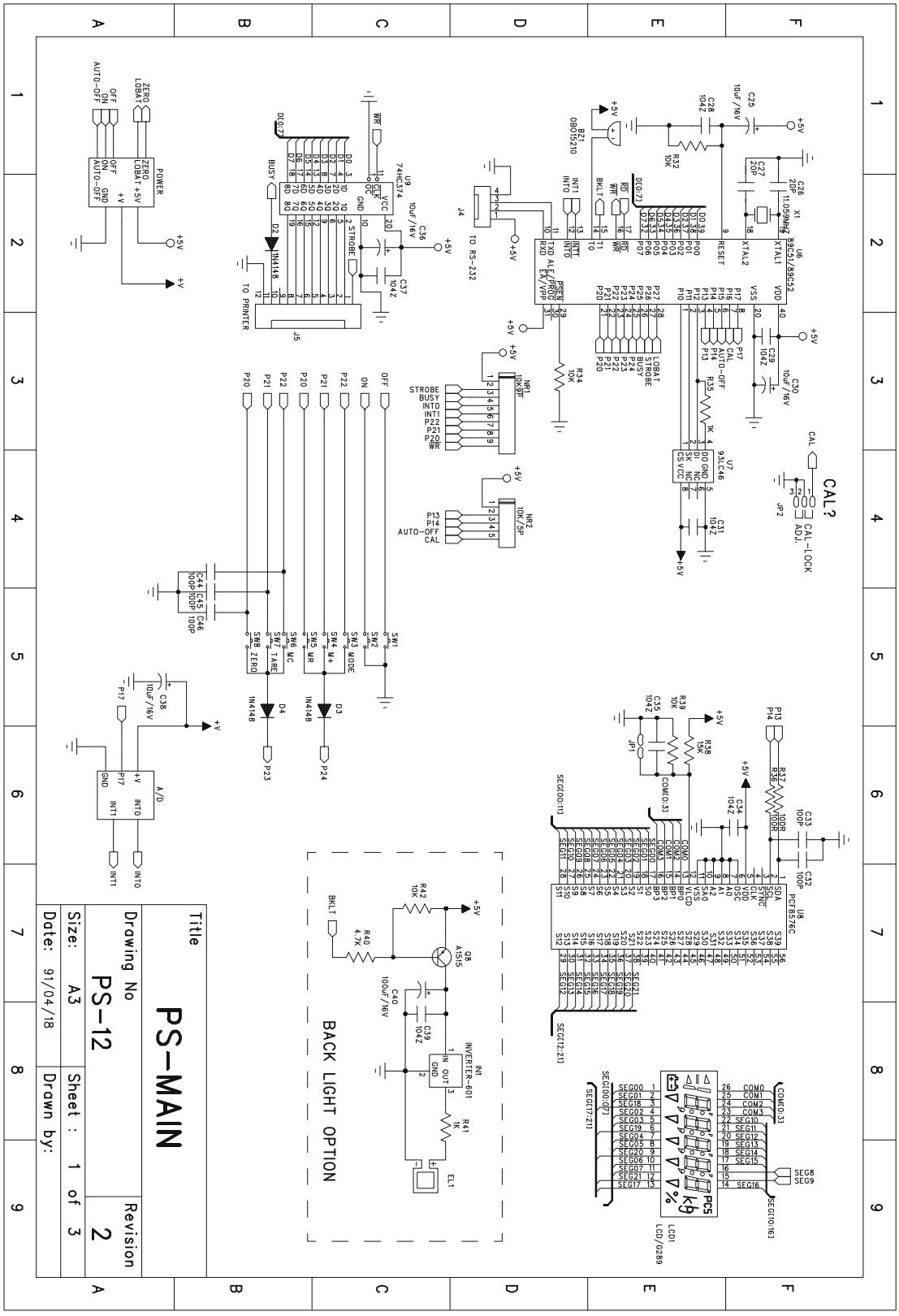
3.2.5.2 Check that the signal output of loadcell is normal.

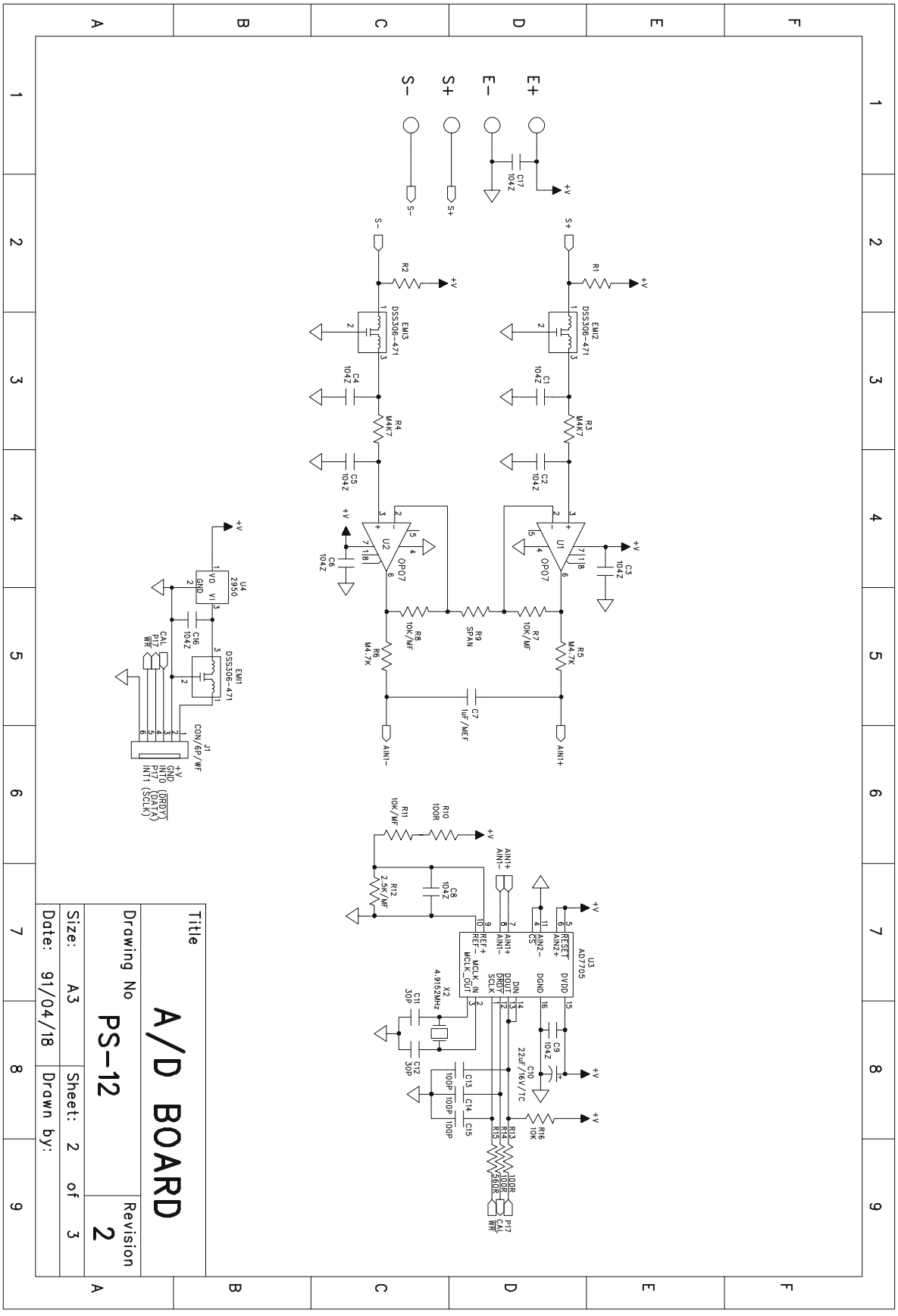
3.2.5.3 Check OP. Amplifiers & A/D Converter (AD7705).

When no error is found with the above checking procedures, the trouble can be caused on the loadcell or the PCB itself. Replace a new one could be better to identify the defective.
In this way, the readout of weight would be varied because of the output voltage of loadcell and different span value, so re-calibration is required after this replacement.

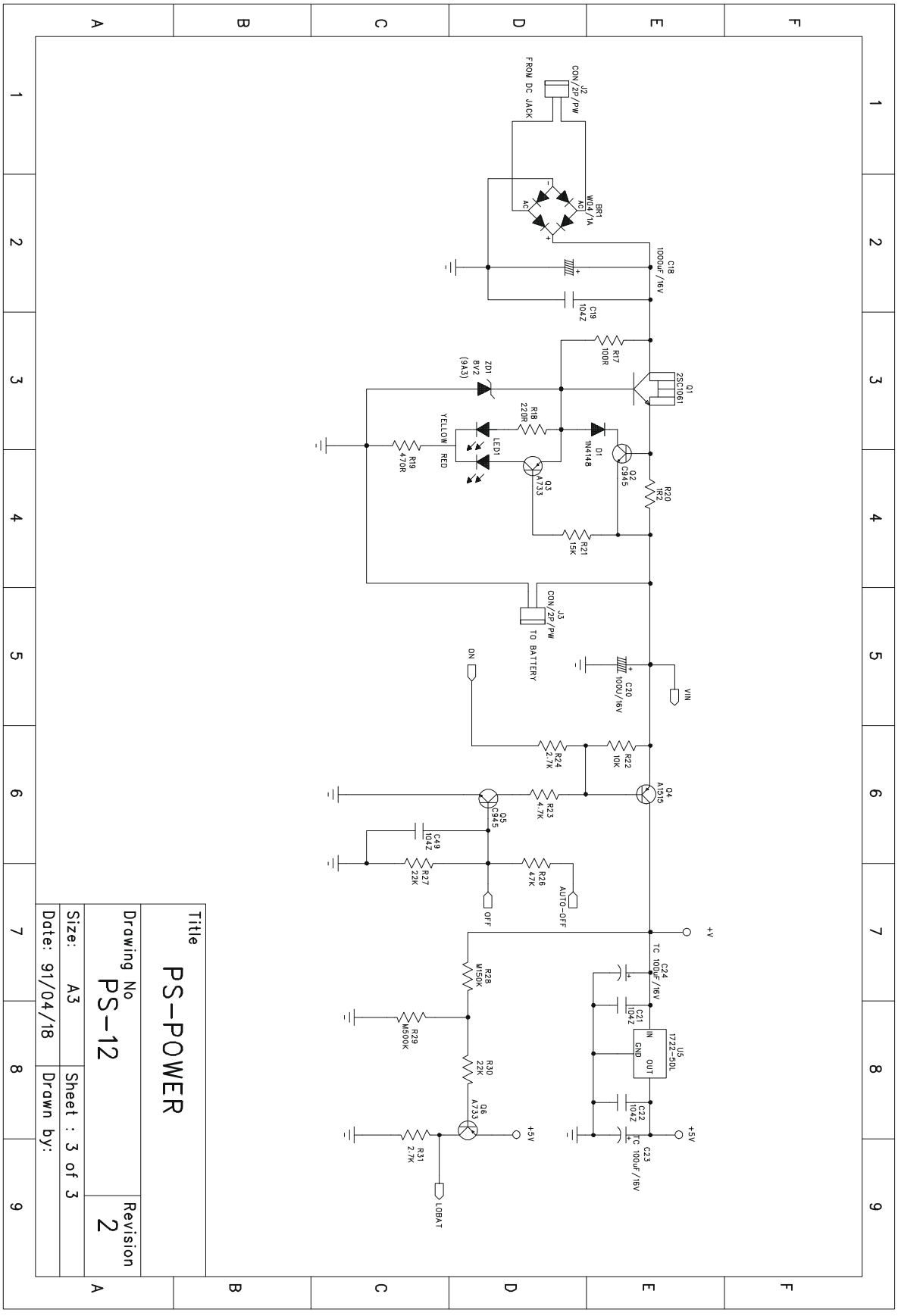
4. ELECTRICAL CIRCUITRY

4.1 SCHEMATICS

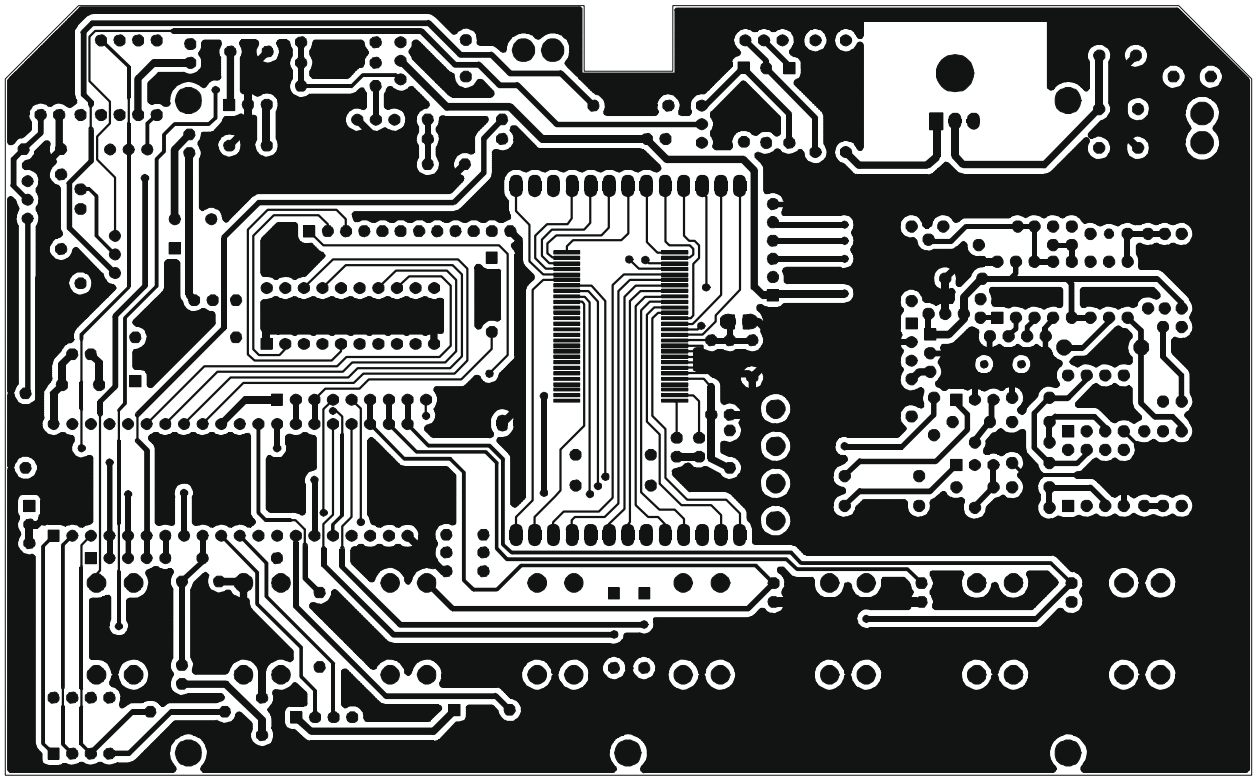




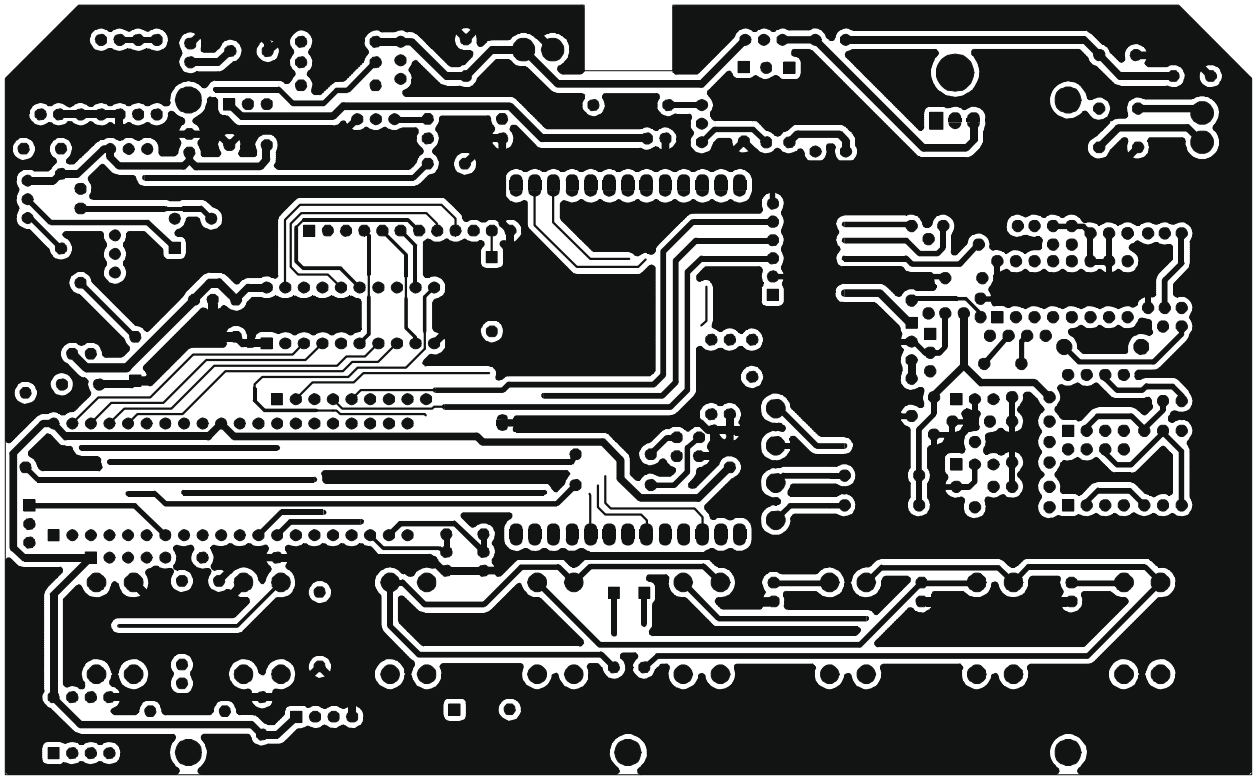
Title		
A/D BOARD		
Drawing No		Revision
PS-12		2
Size: A3	Sheet: 2 of 3	
Date: 91/04/18	Drawn by:	


J2
CON/2P/PW
FROM DC JACK
BR1
WD4/1A
AC
AC
C18
1000uF/16V
C19
104Z
R17
100R
ZD1
8V2
(943)
Q1
2SC1061
R18
220R
YELLOW
RED
LED1
R19
470R
D1
1N4148
Q2
C945
Q3
A733
R20
1R2
R21
15K
J3
CON/2P/PW
TO BATTERY
C20
100U/16V
VIN
DN
R24
2.7K
R22
10K
Q4
A1515
Q5
C945
R23
4.7K
C49
104Z
R27
22K
R26
47K
AUTO-OFF
OFF
+V
C24
TC 100uF/16V
C21
104Z
U5
7722-50L
IN
GND
OUT
C22
104Z
C23
TC 100uF/16V
+5V
+5V
R28
M150K
R29
M500K
R30
22K
Q6
A733
R31
27K
LOBAT
Title
PS-POWER
Drawing No
PS-12
Revision
2
Size: A3
Sheet : 3 of 3
Date: 91/04/18
Drawn by:

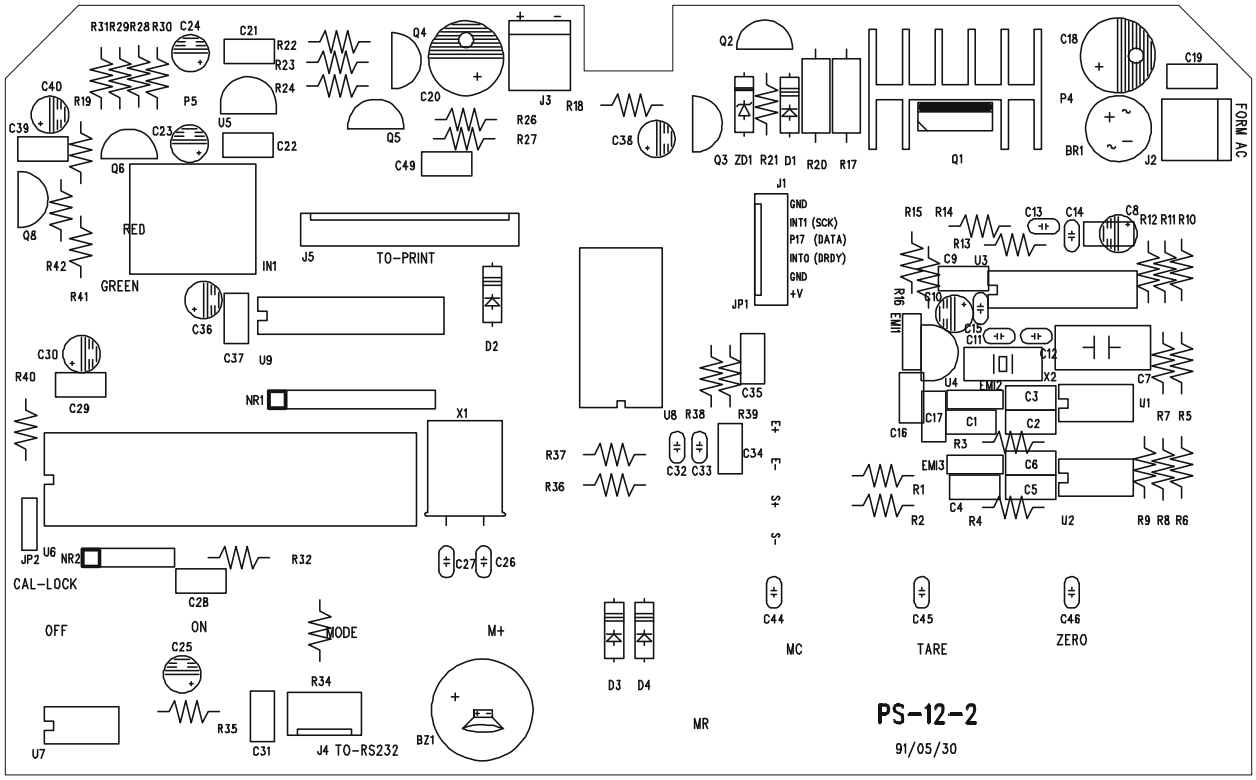
4.2 PCB LAYOUT



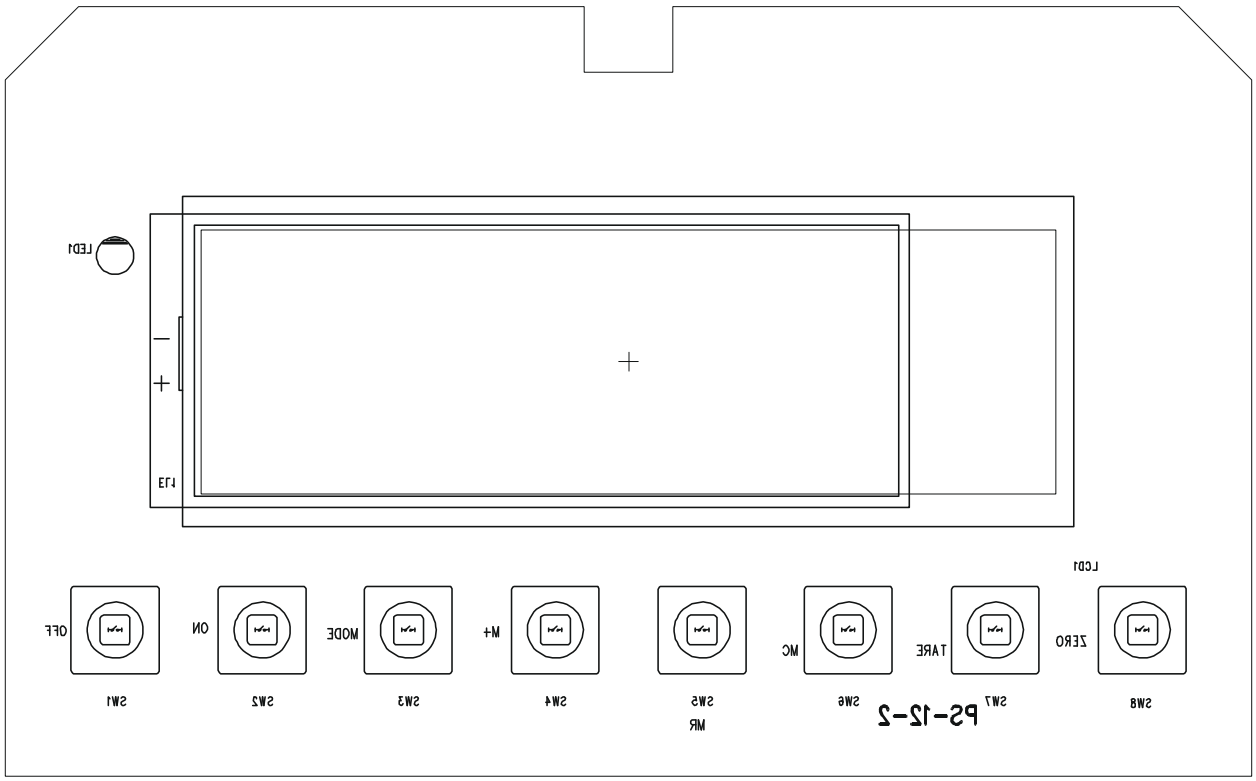
PS-12-2 TOP LAYER



PS-12-2 BOTTOM LAYER



PS-12-2 TOP OVERLAY



PS-12-2 BOTTOM OVERLAY

5. BILL OF MATERIAL

STRUCTURE

Parts No.	Description	Specification	Qty	Remark
A1007000001	FERRITE CORE	TR-16*9*28mm	2	
A1007000003	FERRITE CORE	TR-11.8*7.3*15mm	1	
A1007000004	FERRITE CORE	T-28.3*13.8*13.5mm	1	
C1PS1000000	PANEL PC	PS SERIES(TRANSPARENT)	1	
F0003PS0000	S/S PLATE	U SHAPE	1	
F0005PS1000	S/S HOUSING(UPPER)	PS SERIES	1	
F0005PS1100	S/S HOUSING(UNDER)	PS SERIES	1	
C1PS2030000	OVERLAY PC	PS2 SERIES	1	
E1PS1000020	P.C.B. KIT	PS-12-X MAINBOARD	1	
A1600060400	RECHARGEABLE BATTERY	6V 4Ah	1	
A1208020351	BATTERY WIRE ARRAY	2PIN 35cm,SINGLE HOUSING	1	
F0013FS0000	BATTERY CLAMP	FS SERIES,132*15mm*1t	1	
F0022000010	S/S ADJUSTABLE FEET	FS SERIES	2	
G0030PS1010	RUBBER FRAME	PS SERIES	1	
G0030PS1000	RUBBER SEALING	PS SERIES	6	
G0030FS0000	RUBBER PLUG	SCD-021	1	
G0030PS1030	RUBBER WASHER	∮ 21(∮ 15.3)*3L	1	
A0950000010	WATER-PROOF CONNECTOR(MALE)	LTW-6MS-C	1	
A0950000011	WATER-PROOF CONNECTOR(FEMALE)	LTW-6FM-90 + 6PIN 100CM CABLE	1	
A60********	ADAPTOR	***V/9V,500mA	1	
A0906000210	DC JACK	SCD-021(BLACK)	1	
A1204040370	WIRE ARRAY	4PIN 37cm	1	
A1208020601	BATTERY WIRE ARRAY	2PIN 60cm, SINGLE HOUSING	1	

PS-12-X MAINBOARD

E0PS0000021	P.C.B.	PS-12-X	1	
A0102000289	L.C.D.	UTN-G289JV-W	1	LCD1
A020108958 2	I.C.	SM8958AC25P	1	U6
A0202093462	I.C.	93C46PC27 OR 93LC46	1	U7
A0207017220	VOLTAGE REGULATOR I.C.	AIC1722-50CZT	1	U5
A0208085760	I.C.	PCF8576CT	1	U8
A0300000040	I.C. SOCKET	40 PIN	1	U6
A0401007330	TRANSISTOR	A733	2	Q3,6
A0401009450	TRANSISTOR	2SC945	2	Q2,5

A0401010610	TRANSISTOR	H1061C OR D880	1	Q1
A0401015150	TRANSISTOR	A1515	2	Q4,8
A0501004148	DIODE	1N4148	4	D1-4
A0502000001	BRIDGE RECTIFIER	W06(1A)	1	BR1
A0503020082	ZENER DIODE	1/2W 8V2(9A3)	1	ZD1
A0625050000	L.E.D.	GREEN/RED,ROUND 5mm	1	LED1
A0701106017	CAPACITOR (EC)	10uF/25V(SS TYPE)	4	C25,30,36,38
A0701107016	CAPACITOR (EC)	100uF/16V	3	C23,24,40
A0701108016	CAPACITOR (EC)	1000uF/16V	1	C18
A0701477016	CAPACITOR (EC)	470uF/16V	1	C20
A0730104050	CAPACITOR (MLC)	104Z	11	C19,21-22,28-29,31, 34-35,37,39,49
A0740030050	CERAMIC CAPACITOR (CC)	30pf/50V(30)	2	C26,27
A0740101050	CERAMIC CAPACITOR (CC)	100pf/50V(101)	5	C32,33,44-46
A0804041503	METAL FILM RESISTOR	150KΩ 1/4W	1	R28
A0804045003	METAL FILM RESISTOR	500KΩ 1/4W	1	R29
A0805020120	CARBON FILM RESISTOR	1.2Ω 1/2W	1	R20
A0805021101	CARBON FILM RESISTOR	100Ω 1/2W	1	R17
A0805041101	CARBON FILM RESISTOR	100Ω 1/4W	2	R36,37
A0805041221	CARBON FILM RESISTOR	220Ω 1/4W	1	R18
A0805041102	CARBON FILM RESISTOR	1KΩ 1/4W	2	R35,41
A0805041103	CARBON FILM RESISTOR	10KΩ 1/4W	6	R22,27,32,34,39,42
A0805041153	CARBON FILM RESISTOR	15KΩ 1/4W	2	R21,38
A0805041223	CARBON FILM RESISTOR	22KΩ 1/4W	1	R30
A0805041272	CARBON FILM RESISTOR	2.7KΩ 1/4W	2	R24,31
A0805041471	CARBON FILM RESISTOR	470Ω 1/4W	1	R19
A0805041472	CARBON FILM RESISTOR	4.7KΩ 1/4W	1	R25,40
A0805041473	CARBON FILM RESISTOR	47KΩ 1/4W	1	R26
A0802010305	RESISTOR NETWORK	10KΩ 5 PIN	1	NR2
A0802010309	RESISTOR NETWORK	10KΩ 9 PIN	1	NR1
A0902010020	CONNECTOR	2 PIN WAFER,PITCH=3.9mm	2	J2,3
A0907010030	CONNECTOR	1 * 3 PIN 180°	1	JP2
A0910111020	MINI JUMPER	PITCH 2.54	1	JP2
A0910100130	SOCKET STRIPS	SIP 1*13(FEMALE)	2	LCD1
A1100211059	CRYSTAL	11.0592MHZ	1	X1
A1500000004	BUZZER	OBO-15210	1	BZ1
A1306000003	TACT SW.	KPT-1104B	8	SW1-8
A5004000004	HEAT SINK	MB-217-22+PIN	1	Q1

A/D SECTION

A0203077050	I.C.	AD7705AN	1	U3
A0206000072	I.C	OP177	2	U1-2
A0207029500	VOLTAGE REGULATOR I.C.	AS2950AW	1	U4
A0702226016	CAPACITOR (TC)	22uF/16V(226)	1	C10
A0713105063	POLYESTER FILM CAPACITOR(MEF)	1uF/63V (105)	1	C7
A0730104050	CAPACITOR (MLC)	104Z	5	C3,6,9,16,17
A0731104050	CAPACITOR (X7R)	104Z	5	C1,2,4,5,8
A0740047050	CERAMIC CAPACITOR (CC)	47pf/50V(47)	2	C11-12
A0740101050	CERAMIC CAPACITOR (CC)	100pf/50V(101)	3	C13-15
A0803041002	METAL FILM RESISTOR	10KΩ 1/4W	2	R7-8
A0803041501	METAL FILM RESISTOR	1.5KΩ 1/4W	1	R12
A0803043001	METAL FILM RESISTOR	3KΩ 1/4W	1	R11
A080304XXXX	METAL FILM RESISTOR	XKΩ 1/4W	1	R9 (SPAN)
A0804044701	METAL FILM RESISTOR	4.7KΩ 1/4W	4	R3-6
A0805041101	CARBON FILM RESISTOR	100Ω 1/4W	3	R10,R13-14
A0805041103	CARBON FILM RESISTOR	10KΩ 1/4W	1	R16
A0805041561	CARBON FILM RESISTOR	560Ω 1/4W	1	R15
A1008000001	EMI FILTER	DSS-306-55Y5S471M100	3	EMI1-3
A1100249152	CRYSTAL	4.9152MHZ	1	X2
F0015000012	PROTECTION BOX	7705-52-1 (UPPER)	1	
F0015000013	PROTECTION BOX	7705-52-1 (UNDER)	1	
Z0010000305	SCREW	M3*6	2	

BACK LIGHT OPTION

A1400000006	BACK LIGHT(EL)	130.0*44mm	1	EL1
A1401005000	BACK LIGHT INVERTER	5V / 90c ㎡	1	IN1

RS232 OPTION

A091010040	CONNECTOR	4 PIN WAFER	1	J4
E1PS0100000	P.C.B. KIT	PS-70-X RS-232 BOARD	1	

6. APPENDIX

SyncMOS Technologies Inc. **SM8958**

May 2001 ***8 - Bit Micro-controller***

with 32KB flash & 1KB RAM embedded

Product List

SM8958L25, 25 MHz 32KB internal memory MCU
SM8958C25, 25 MHz 32KB internal memory MCU
SM8958C40, 40 MHz 32KB internal memory MCU

Description

The SM8958 series product is an 8 - bit single chip micro controller with 32KB flash & 1KB RAM embedded. It is a derivative of the 8052 micro controller family. With its hardware features and powerful instruction set, it's straight forward to make it a versatile and cost effective controller for those applications which demand up to 32 I/O pins for PDIP package or up to 36 I/O pins for PLCC/QFP package, or applications which need up to 32KB memory either for program or for data or mixed.
To program the on-chip flash memory, a commercial writer is available to do it in parallel programming method.

Ordering Information

yywwv
SM8958ihhk

yy: year, ww:week
v: version identifier {, A, B,...}
i: process identifier {L=3.0V ~ 3.6V, C=4.5V ~ 5.5V}
hh: working clock in MHz {25, 40}
k: package type postfix {as below table}

Postfix	Package	Pin/Pad Configuration	Dimension
P	40L PDIP	page 2	page15
J	44L PLCC	page 2	page16
Q	44L QFP	page 2	page17

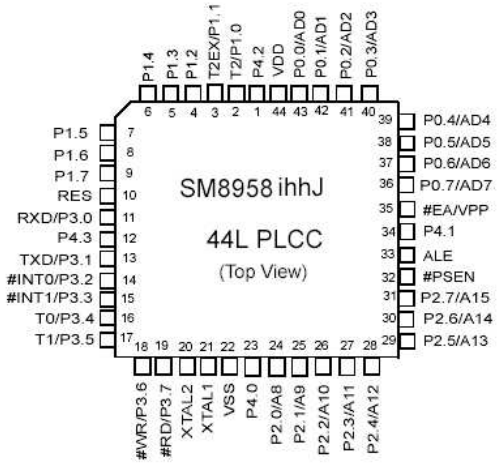
Features

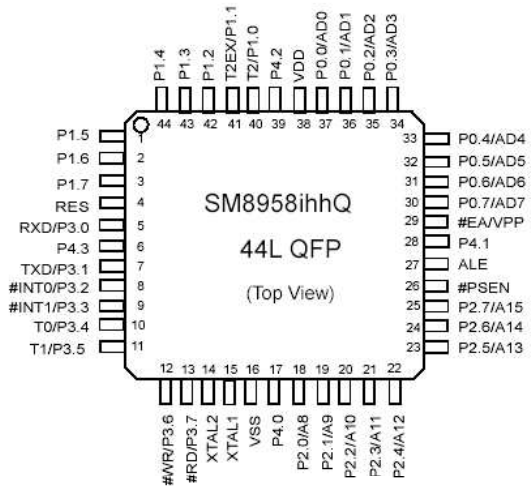
- Working voltage: 3.0V ~ 3.6V For L Version
  4.5V ~ 5.5V For C Version
- General 8052 family compatible
- 12 clocks per machine cycle
- 32 KB internal flash memory
- 1024 bytes data RAM
- 3 16 bit timers/counters
- Four 8-bit I/O ports for PDIP package
- Four 8-bit I/O ports + one 4-bit I/O ports for PLCC or QFP package
- Full duplex serial channel
- Bit operation instruction
- Page free jumps
- 8-bit unsigned division
- 8-bit unsigned multiply
- BCD arithmetic operations
- Direct addressing
- Indirect addressing
- Nested interrupts
- Two priority level interrupts
- A serial I/O port
- Power save modes:
  Idle mode and power down mode
- Code protection function
- One watch dog timer (WDT)
- Low EMI (inhibit ALE)

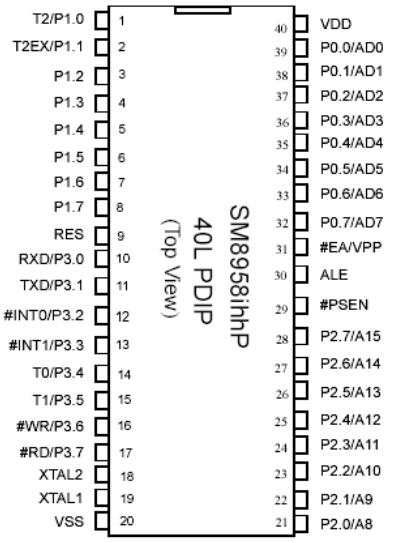
Taiwan
4F, No. 1 Creation Road 1,
Science-based Industrial Park,
Hsinchu, Taiwan 30077

TEL: 886-3-579-2926
886-3-579-2988
FAX: 886-3-579-2960
886-3-578-0493

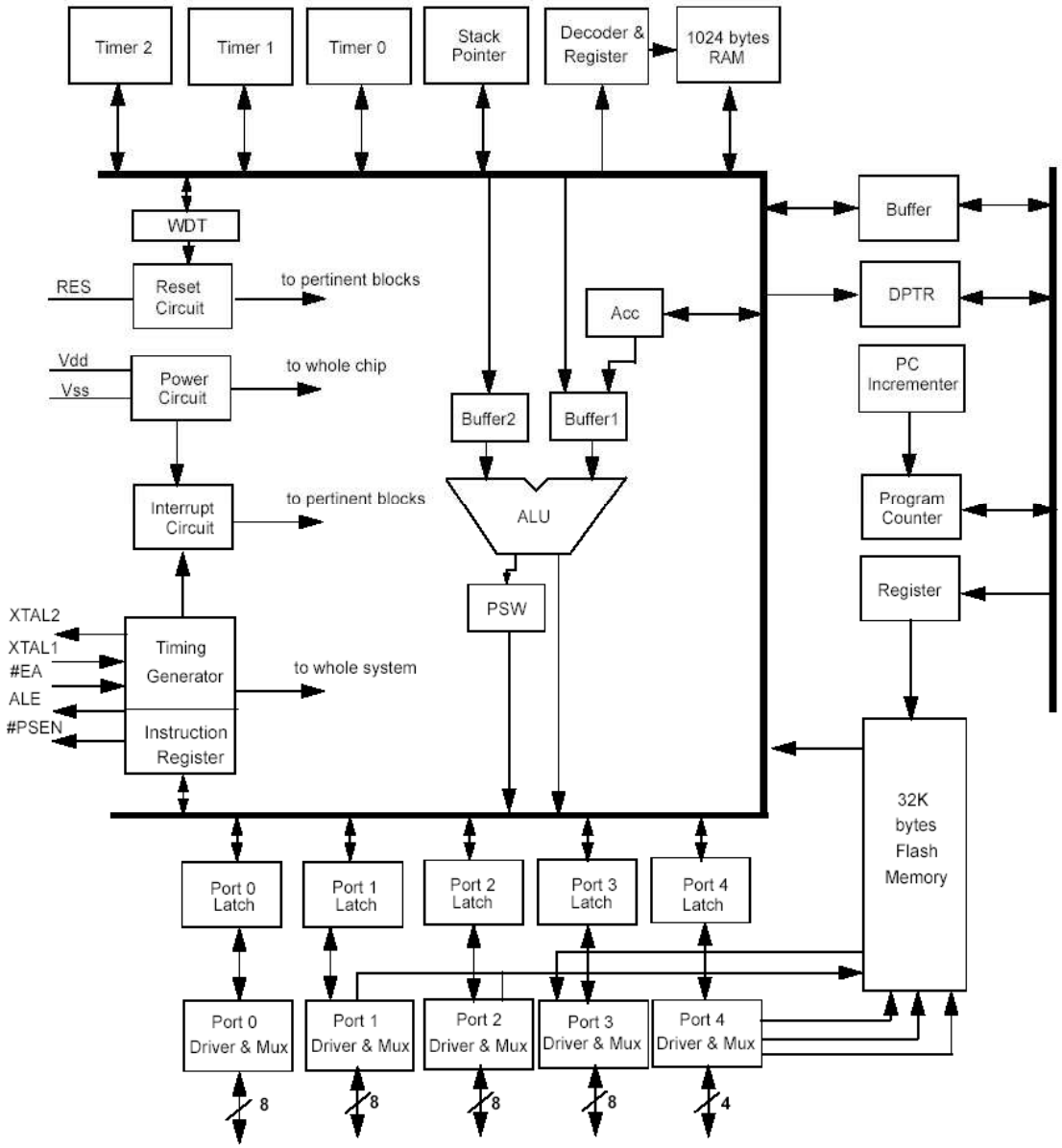
Pin Configurations







Block Diagram



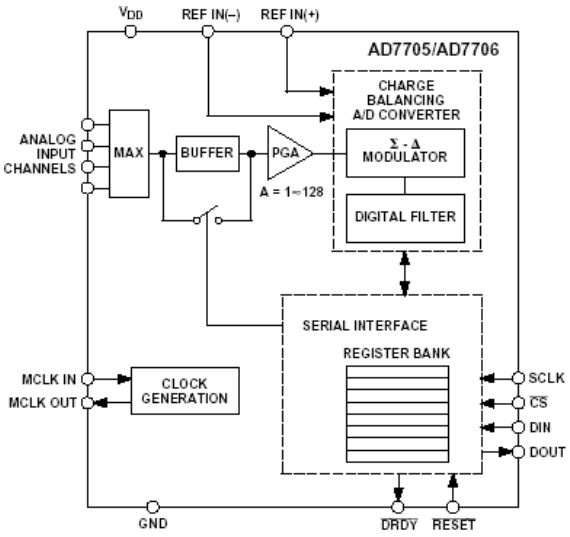
3 V/5 V, 1 mW
2-/3-Channel 16-Bit, Sigma-Delta ADCs

AD7705/AD7706*

FEATURES

AD7705: Two Fully Differential Input Channel ADCs
AD7706: Three Pseudo Differential Input Channel ADCs
16 Bits No Missing Codes
0.003% Nonlinearity
Programmable Gain Front End
Gains from 1 to 128
Three-Wire Serial Interface
SPI™, QSPI™, MICROWIRE™ and DSP Compatible
Schmitt Trigger Input on SCLK
Ability to Buffer the Analog Input
2.7 V to 3.3 V or 4.75 V to 5.25 V Operation
Power Dissipation 1 mW max @ 3 V
Standby Current 8 μA max
16-Lead DIP, 16-Lead SOIC and TSSOP Packages

FUNCTIONAL BLOCK DIAGRAM



GENERAL DESCRIPTION

The AD7705/AD7706 are complete analog front ends for low frequency measurement applications. These two-/three-channel devices can accept low level input signals directly from a transducer and produce a serial digital output. They employ a sigma-delta conversion technique to realize up to 16 bits of no missing codes performance. The selected input signal is applied to a proprietary programmable gain front end based around an analog modulator. The modulator output is processed by an on-chip digital filter. The first notch of this digital filter can be programmed via an on-chip control register allowing adjustment of the filter cutoff and output update rate.

The AD7705/AD7706 operate from a single 2.7 V to 3.3 V or 4.75 V to 5.25 V supply. The AD7705 features two fully differential analog input channels while the AD7706 features three pseudo differential input channels. Both devices feature a differential reference input. Input signal ranges of 0 mV to +20 mV through 0 V to +2.5 V can be incorporated on both devices when operating with a V_{DD} of 5 V and a reference of 2.5 V. They can also handle bipolar input signal ranges of ±20 mV through ±2.5 V, which are referenced to the AIN(–) inputs on the AD7705 and to the COMMON input on the AD7706. The AD7705/AD7706, with 3 V supply and a 1.225 V reference, can handle unipolar input signal ranges of 0 mV to +10 mV through 0 V to +1.225 V. Its bipolar input signal ranges are ±10 mV through ±1.225 V. The AD7705/AD7706 thus perform all signal conditioning and conversion for a two- or three-channel system.

The AD7705/AD7706 are ideal for use in smart, microcontroller or DSP-based systems. They feature a serial interface that can be configured for three-wire operation. Gain settings, signal polarity and update rate selection can be configured in software using the input serial port. The part contains self-calibration and system calibration options to eliminate gain and offset errors on the part itself or in the system.

CMOS construction ensures very low power dissipation, and the power-down mode reduces the standby power consumption to 20 μW typ. These parts are available in a 16-lead, 0.3 inch-wide, plastic dual-in-line package (DIP), a 16-lead wide body (0.3 inch) small outline (SOIC) package and also a low profile 16-lead TSSOP.

PRODUCT HIGHLIGHTS

1. The AD7705/AD7706 consumes less than 1 mW at 3 V supplies and 1 MHz master clock, making it ideal for use in low power systems. Standby current is less than 8 μA.
2. The programmable gain input allows the AD7705/AD7706 to accept input signals directly from a strain gage or transducer, removing a considerable amount of signal conditioning.
3. The AD7705/AD7706 is ideal for microcontroller or DSP processor applications with a three-wire serial interface reducing the number of interconnect lines and reducing the number of opto-couplers required in isolated systems.
4. The part features excellent static performance specifications with 16 bits, no missing codes, ±0.003% accuracy and low rms noise (<600 nV). Endpoint errors and the effects of temperature drift are eliminated by on-chip calibration options, which remove zero-scale and full-scale errors.

*Protected by U.S. Patent Number 5,134,401.
SPI and QSPI are trademarks of Motorola, Inc.
MICROWIRE is a trademark of National Semiconductor.

REV. A

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781/329-4700 World Wide Web Site: http://www.analog.com
Fax: 781/326-8703

1 FEATURES

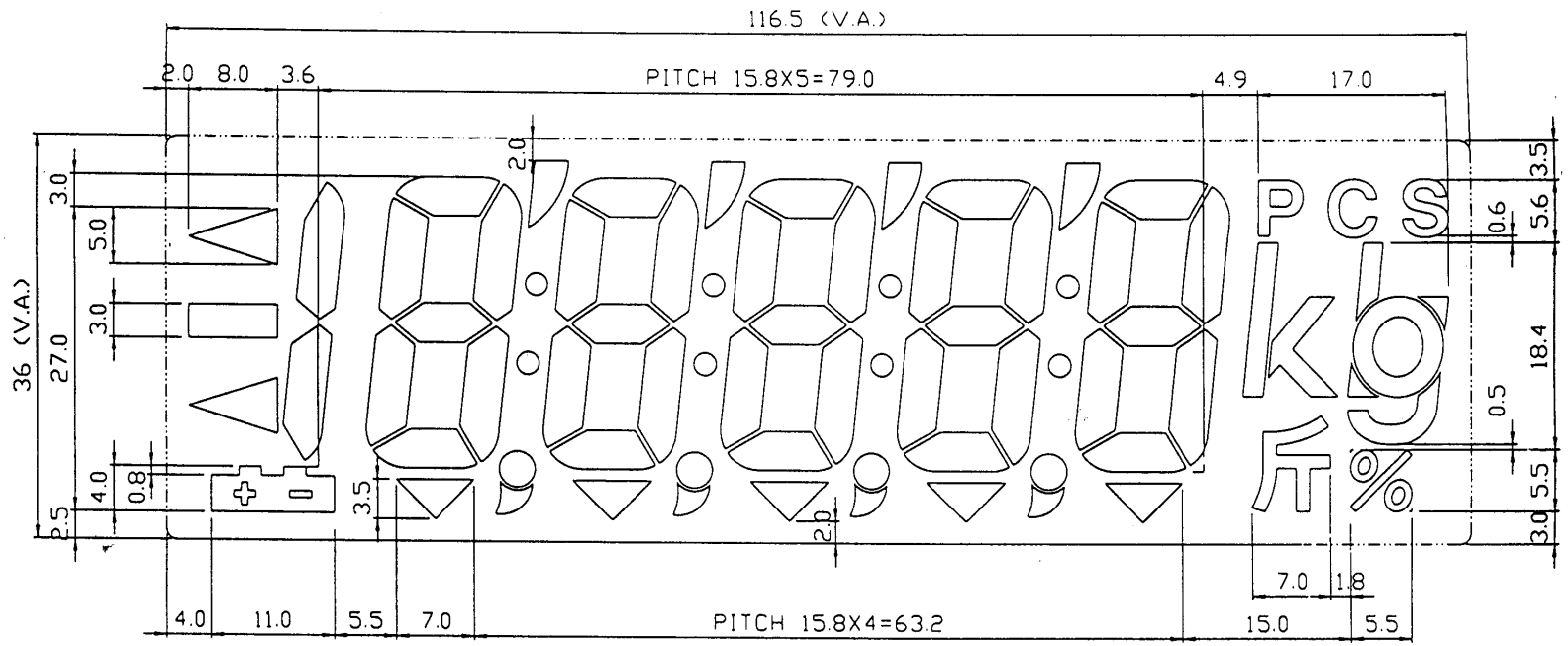
- Single-chip LCD controller/driver
- Selectable backplane drive configuration: static or 2/3/4 backplane multiplexing
- Selectable display bias configuration: static, ½ or ⅓
- Internal LCD bias generation with voltage-follower buffers
- 40 segment drives: up to twenty 8-segment numeric characters; up to ten 15-segment alphanumeric characters; or any graphics of up to 160 elements
- 40 × 4-bit RAM for display data storage
- Auto-incremented display data loading across device subaddress boundaries
- Display memory bank switching in static and duplex drive modes
- Versatile blinking modes
- LCD and logic supplies may be separated
- Wide power supply range: from 2 V for low-threshold LCDs and up to 9 V for guest-host LCDs and high-threshold (automobile) twisted nematic LCDs
- Low power consumption
- Power-saving mode for extremely low power consumption in battery-operated and telephone applications
- I²C-bus interface
- TTL/CMOS compatible
- Compatible with any 4-bit, 8-bit or 16-bit microprocessors/microcontrollers
- May be cascaded for large LCD applications (up to 2560 segments possible)
- Cascadable with 24-segment LCD driver PCF8566
- Optimized pinning for plane wiring in both single and multiple PCF8576 applications
- Space-saving 56-lead plastic very small outline package (VSO56)
- Very low external component count (at most one resistor, even in multiple device applications)
- Compatible with chip-on-glass technology
- Manufactured in silicon gate CMOS process.

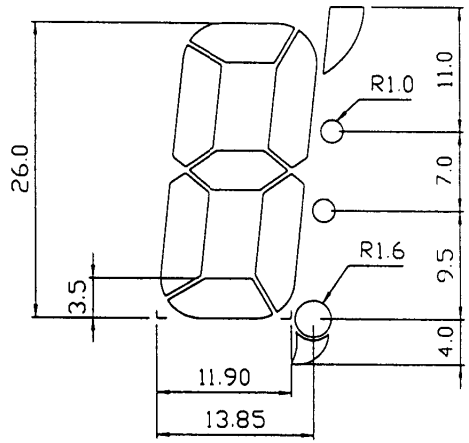
2 GENERAL DESCRIPTION

The PCF8576 is a peripheral device which interfaces to almost any Liquid Crystal Display (LCD) with low multiplex rates. It generates the drive signals for any static or multiplexed LCD containing up to four backplanes and up to 40 segments and can easily be cascaded for larger LCD applications. The PCF8576 is compatible with most microprocessors/microcontrollers and communicates via a two-line bidirectional I²C-bus. Communication overheads are minimized by a display RAM with auto-incremented addressing, by hardware subaddressing and by display memory switching (static and duplex drive modes).

3 ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PCF8576T	VSO56	plastic very small outline package; 56 leads	SOT190-1
PCF8576U	–	chip in tray	–
PCF8576U/2	–	chip with bumps in tray	–
PCF8576U/5	–	unsawn wafer	–
PCF8576U/10	FFC	chip on film frame carrier (FFC)	–
PCF8576U/12	FFC	chip with bumps on film frame carrier (FFC)	–





設計課
APR 21 1997
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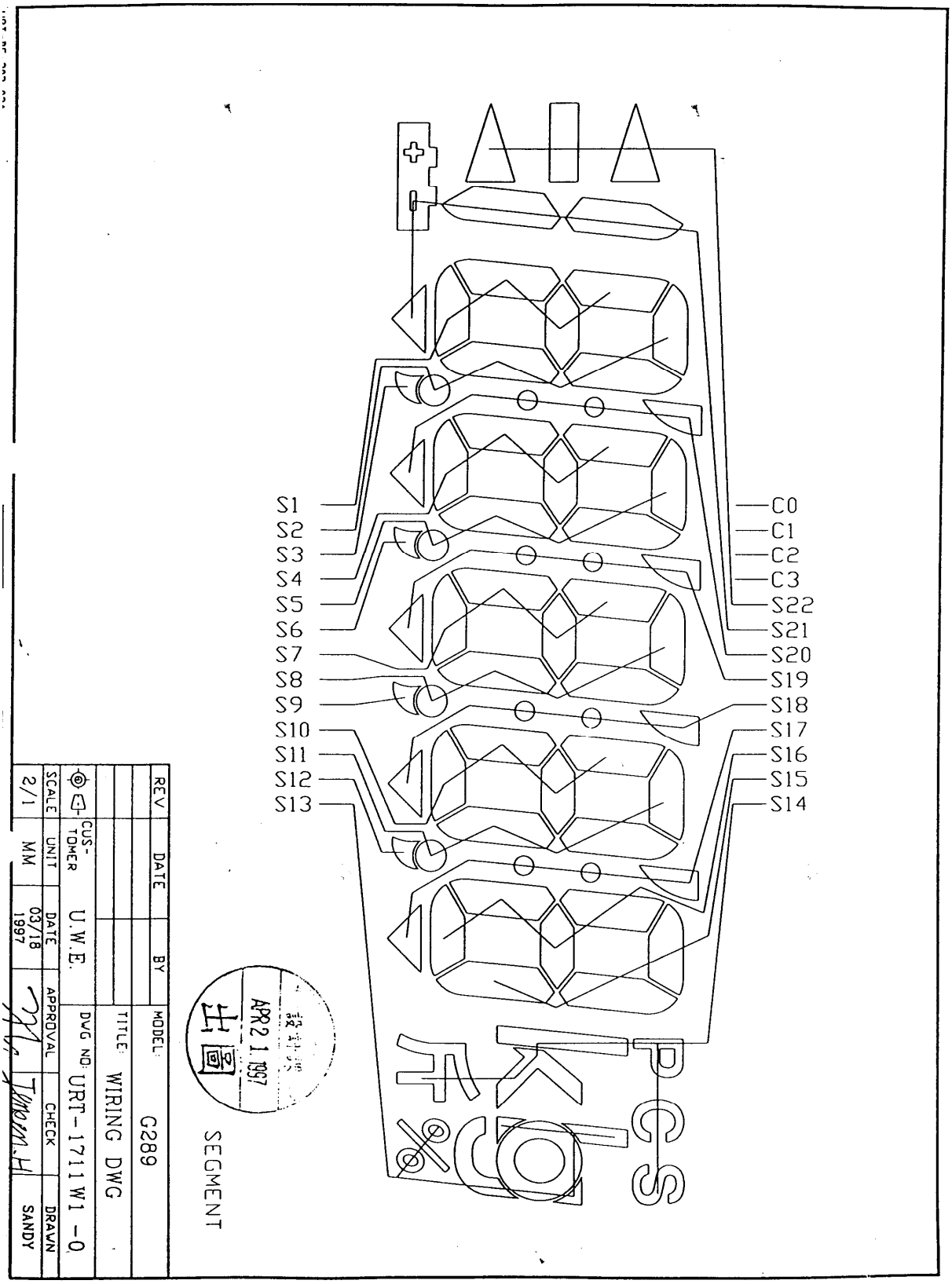
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C3
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BY
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CHECK
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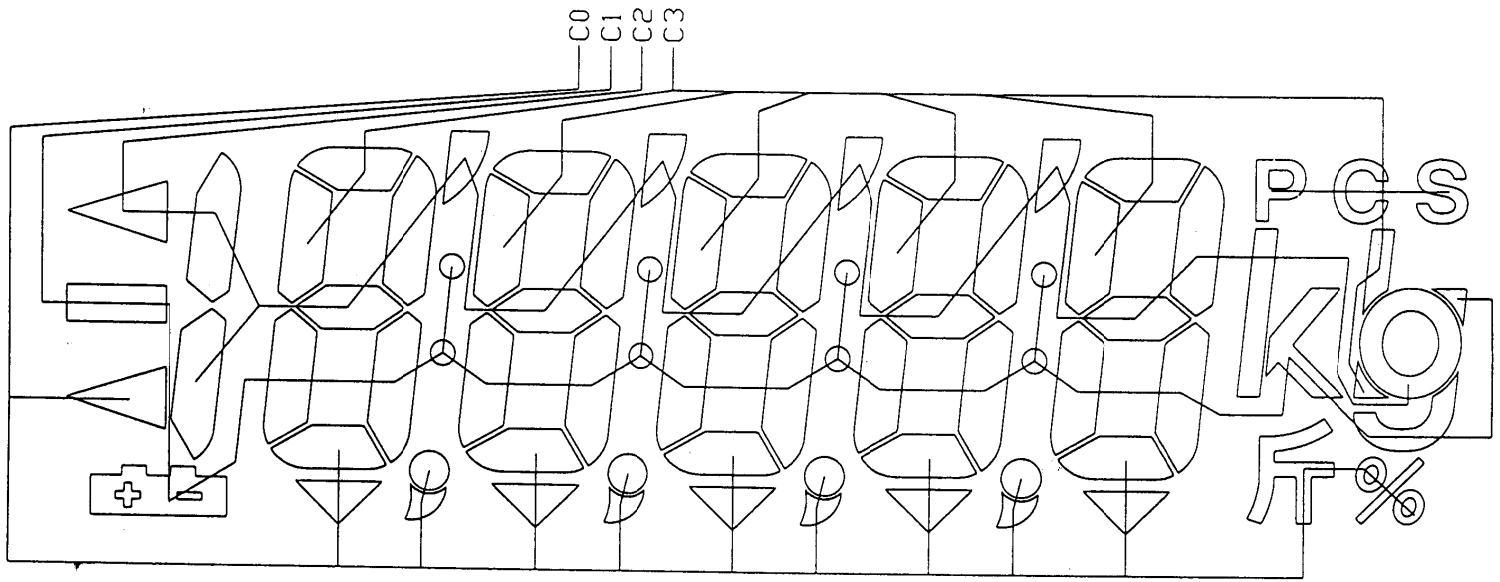

APR 2 1 1997
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COMMON

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			DWG NO: URT-1711W2 -0
CUS-TOMER	U.W.E.		

SCALE	UNIT	DATE	APPROVAL	CHECK	DRAWN
2/1	MM	03/18 1997		Jensen.H	SANDY

URT-BE-303-02A

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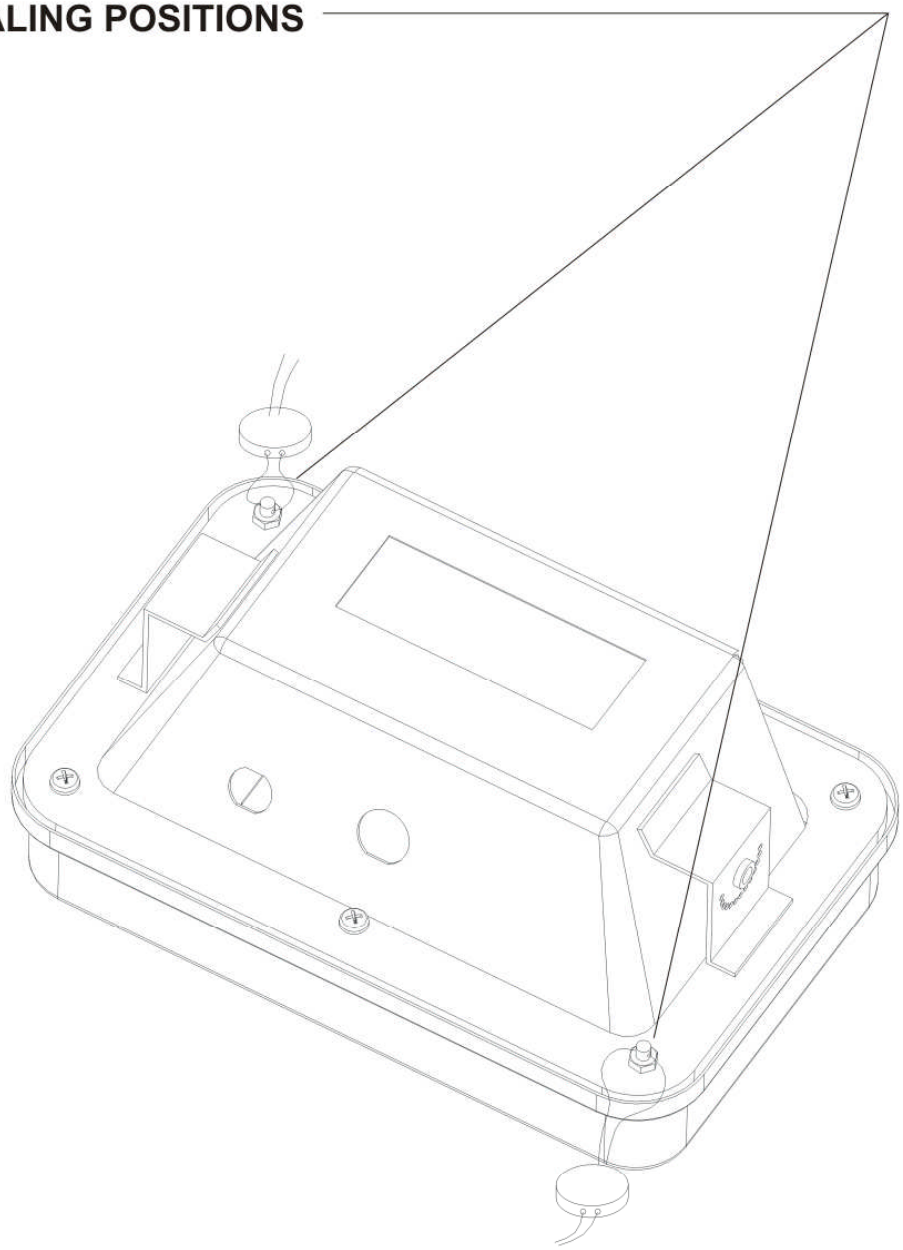
APS SERIES SEALING DIAGRAM

SEALING POSITIONS



APS SERIES EXPLOSION DIAGRAM

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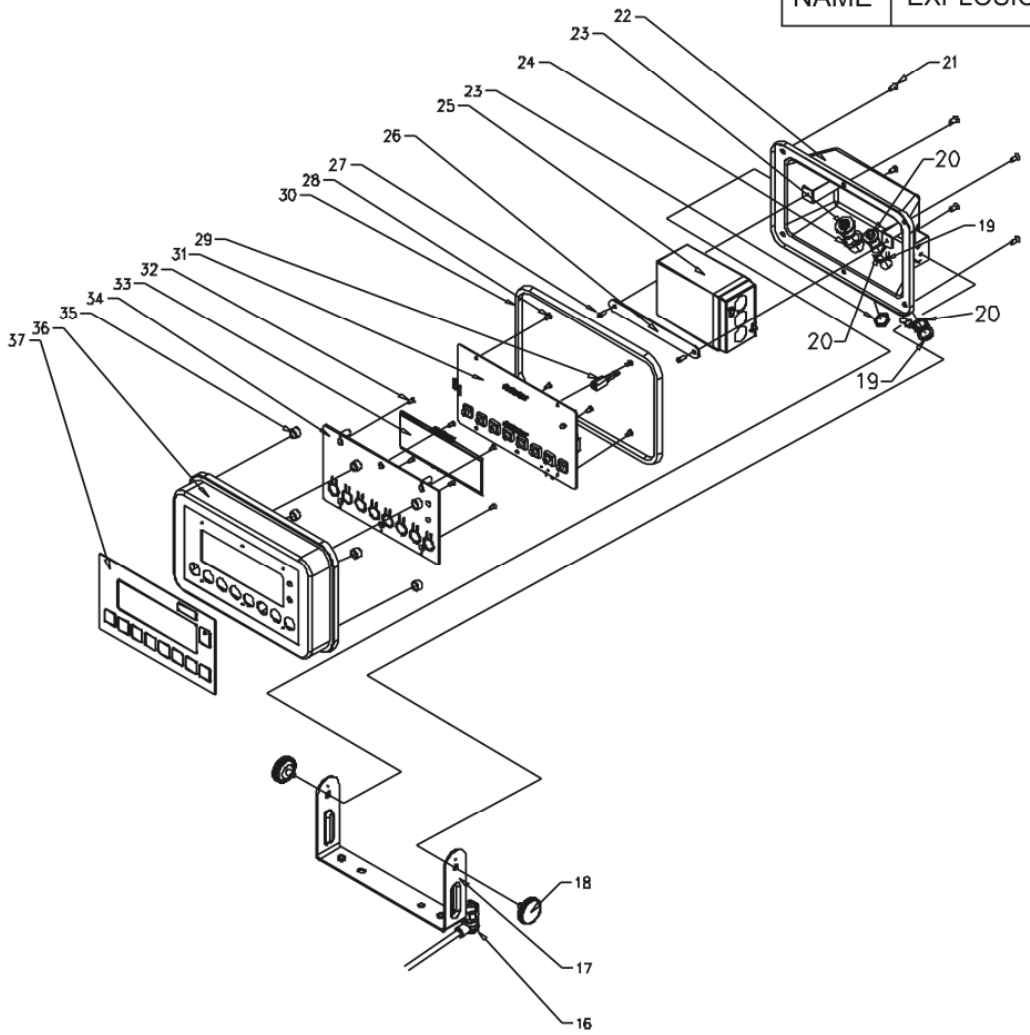

ITEM	PART NO.	PART NAME	DESCRIPTION	QTY
16	A0950000011	CONNECTOR	6 PIN 100cm(LTW-6FM-90)	1
17	F0003PS0000	S/S PLATE	PS SERIES, U SHAPE	1
18	F0022000010	S/S ADJUSTABLE FEET	FS SERIES	2
19	G0030FS0000	RUBBER PLUG	FS SERIES (DC JACK)	1
20	A0906000210	D.C. JACK	SCD-021 (BLACK)	1
21	Z0015100406	SCREW	M4x0.7Px6L	6
22	F0005PS1100	S/S HOUSING	PS SERIES(UNDER)	1
23	A0950000010	CONNECTOR	LTW-6MS-C	1
25	A1600060400	RECHARGEABLE BATTERY	GP4-6 6V 4AH	1
26	F0013FS0000	BATTERY CLAMP	FS SERIES, 132*15mm	1
27	Z0010000308	SCREW	M3x0.5Px8L	2
28	Z0010001305	SCREW	TAPED ∮ 3x5L	5
29	A1208020351	BATTERY WIRE ARRAY	2PIN 35cm(SINGLE HOUSING)	1
30	G0030PS1010	RUBBER FRAME	PS SERIES	1
31	E1PSXXXXXXX	P.C.B. KIT	PS-10-X	1
32	Z0010000306	SCREW	M3x0.5Px5L	6
33	A0102000289	L.C.D.	UTN-G289JV-W	1
34	C1PS1000000	PANEL PC	PS SERIES(TRANSPARENT)	1
35	G0030PS1000	RUBBER SEALING	PS SERIES	6
36	F0005PS1000	S/S HOUSING	PS SERIES(UPPER)	1
37	C1PS1XXXXXX	OVERLAY PC	PS	1