EK/EW-G SERIES

COMPACT BALANCES

MAINTENANCE MANUAL

MODELS:

EK-120G	EW-60G
EK-200G	EW-300G
EK-600G	EW-600G
EK-1200G	EW-3000G
EK-2000G	
EK-6000G	
EK-12KG	

A&D Company, Limited

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Contents

I. GENERAL DESCRIPTION

1. This document applies to the following models:

    1. EK120G
    2. EK200G
    3. EK600G
    4. EK1200G
    5. EK2000G
    6. EK6000G
    7. EK12KG
    8. EW60G
    9. EW300G
    10. EW600G
    11. EW3000G

2. The EK-G and EW-G series are electronic balances using load cells as weight sensors.

3. The EK-G series and EW-G series have been differentiated by resolution. The EW-G series has a resolution of 1/3,000 and the EK-G series has a greater resolution.

   The following lists the models and their displays and pan shape:

    1. EK120G : 120 g x 0.01 g Round weighing pan
    2. EK200G : 200 g x 0.01 g Round weighing pan
    3. EK600G : 600 g x 0.1 g Square weighing pan
    4. EK1200G : 1,200 g x 0.1 g Square weighing pan
    5. EK2000G : 2,000 g x 0.1 g Square weighing pan
    6. EK6000G : 6,000 g x 1 g Square weighing pan
    7. EK12KG : 12,000 g x 1 g Square weighing pan
    8. EW60G : 60 g x 0.02 g Round weighing pan
    9. EW300G : 300 g x 0.1 g Square weighing pan
    10. EW600G : 600 g x 0.2 g Square weighing pan
    11. EW3000G : 3,000 g x 1 g Square weighing pan

4. The EK-G and EW-G have the same specifications except resolution.

5. There are 13 weighing units available so that a relevant one can be selected .

1. Gram(g)
2. No. of pieces(pcs.)
3. Percent(%)
4. Ounce(oz) = 28.34952313 g
5. Pound(lb) = 453.59237 g
6. Troy ounce(ozt) = 31.1034768 g : Gold
7. Carat(ct) = 0.2 g : Jewels
8. Momme = 3.75 g : Pearl
9. Pennyweight(dwt) = 1.55517384 g : Precious metals
10. Grain(GN) = 0.06479891g : Powder
11. Singapore and Hong Kong (general) tael(tl-S) = 37.7994 g
12. Hong Kong(jewels) tael(tl-H) = 37.429 g
13. Taiwan tael(tl-T) = 37.5 g

* For tael, select either one of them.

6. The following are available as options:

1. OP-03 : RS-232C interface
2. OP-04 : Comparator output
3. OP-05 : Current loop interface
4. OP-07 : Underhook weighing fitting (EK6000G and EK12KG only)
5. OP-09 : Rechargeable battery pack (NiCd)
6. OP-11 : Carrying case

7. Differences between the EK/EW-A and the EK/EW-G

1. The display has been made larger; the character height has been enlarged from 11.5 mm to 15.8 mm.
2. A print switch has been added.
3. The key switch response has been improved.
4. Sampling speed has been increased from 3 times/second to 5 times/second.
5. Single weight registration has been enabled even if it is negative. Pcs., %
6. An automatic power-off function has been added.
7. The RS-232C has been made bidirectional.Q, U, Z
8. An automatic printing function has been added.
9. A comparator function (HI, OK, LO) has been added.
10. The options can be now installed more easily. OP-03, -04, -05, -09

II. DESCRIPTION OF SOFTWARE

1. Outline of Operations

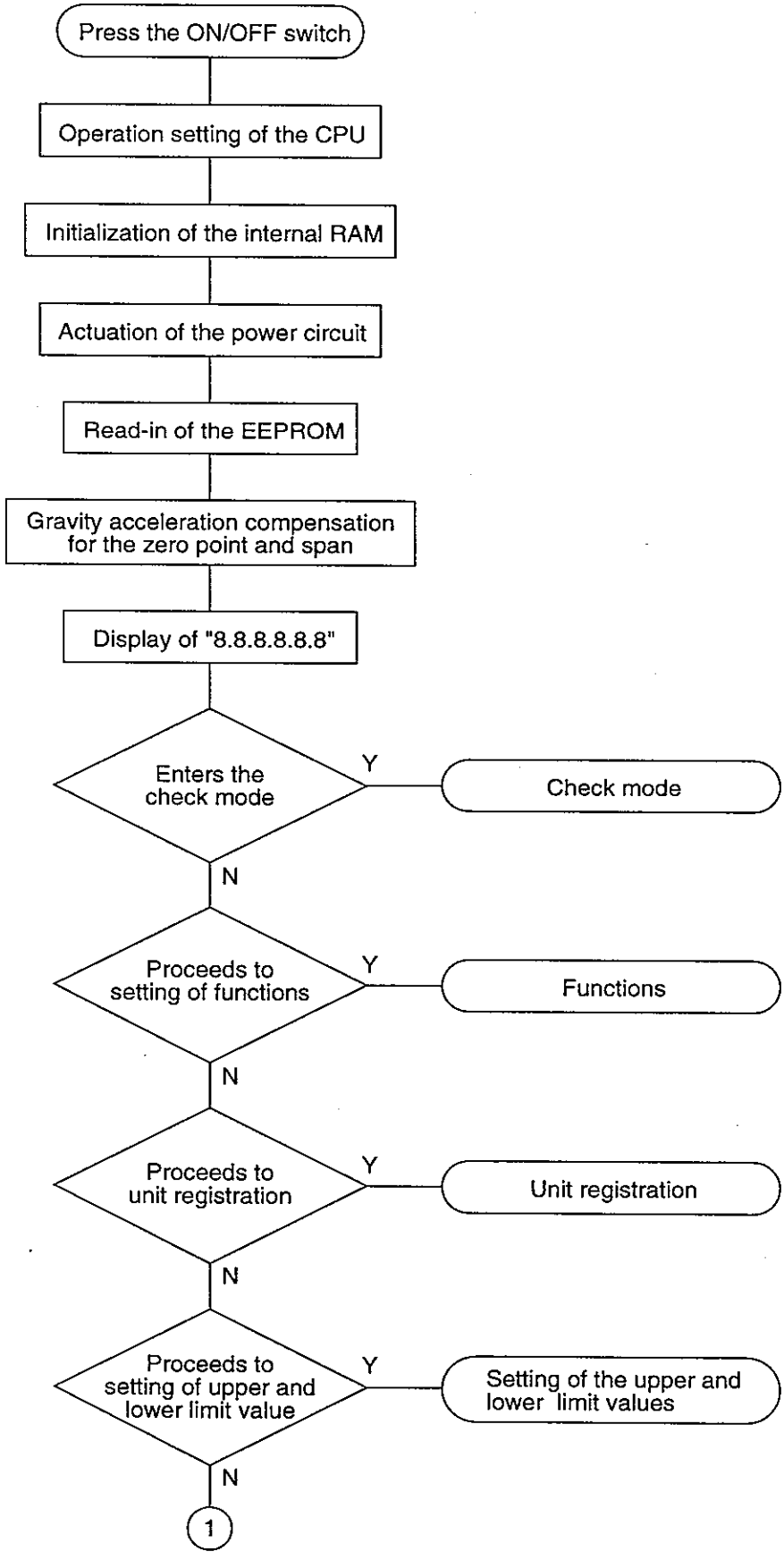
A weight is detected with a sensor called a load cell. An output signal from the load cell(voltage change) is converted from an analog voltage to digital data by a hybrid module(AMZ21). The A/D-converted data (double integration) is processed by a microcomputer (CPU). Control signals for the operation of the A/D converter are sent by the CPU.

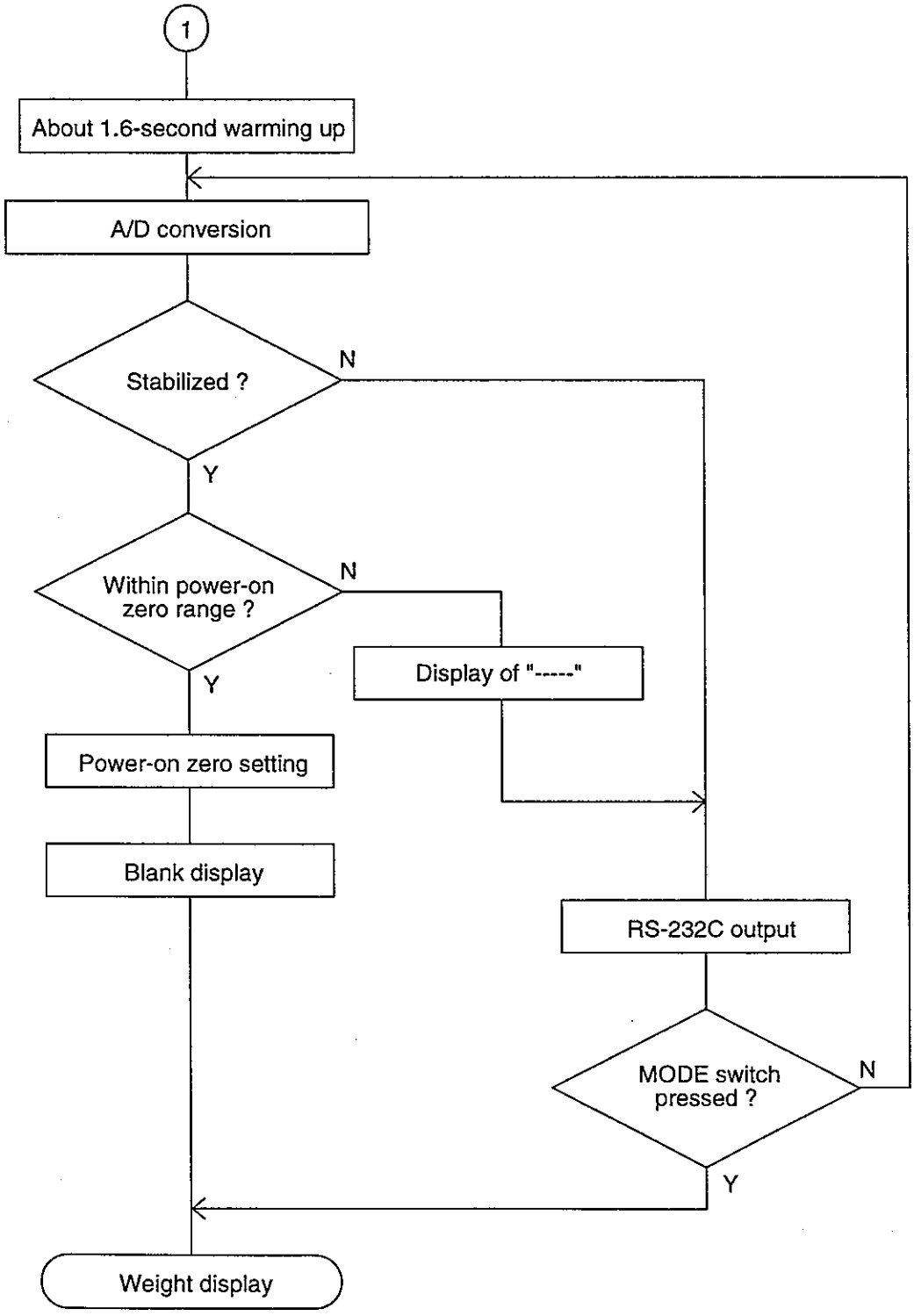
The CPU used in the EK-G/EW-G is a 4-bit microcomputer. This IC alone controls the A/D conversion, reads the key switches, controls the LCD, transmits and receives the serial data.

The software resides in a mask ROM and has been incorporated during manufacture of the microcomputer. Therefore, it cannot be modified. Two power systems are internally used; 10V for the analog system and 5V for the logic system.

2. Start-up sequence after Turning on the Power

2-1 Flow Chart




1
About 1.6-second warming up
A/D conversion
Stabilized ?
N
Y
Within power-on zero range ?
N
Y
Display of "-----"
Power-on zero setting
Blank display
RS-232C output
MODE switch pressed ?
N
Y
Weight display

2-2 Description of the Start-up Sequence

(1) The CPU is initially set while the [ON/OFF] switch is pressed.

(2) Pin No. 11 (of the CPU) is set to the Low level so that you can release the [ON/OFF] switch.

(3) The data is read from the EEPROM(U5).

(4) An LCD check pattern is displayed depending on the specifications.

(5) Performing A/D conversion, the instrument waits for the data to stabilize, that is, both A/D raw data and display data should stabilize.

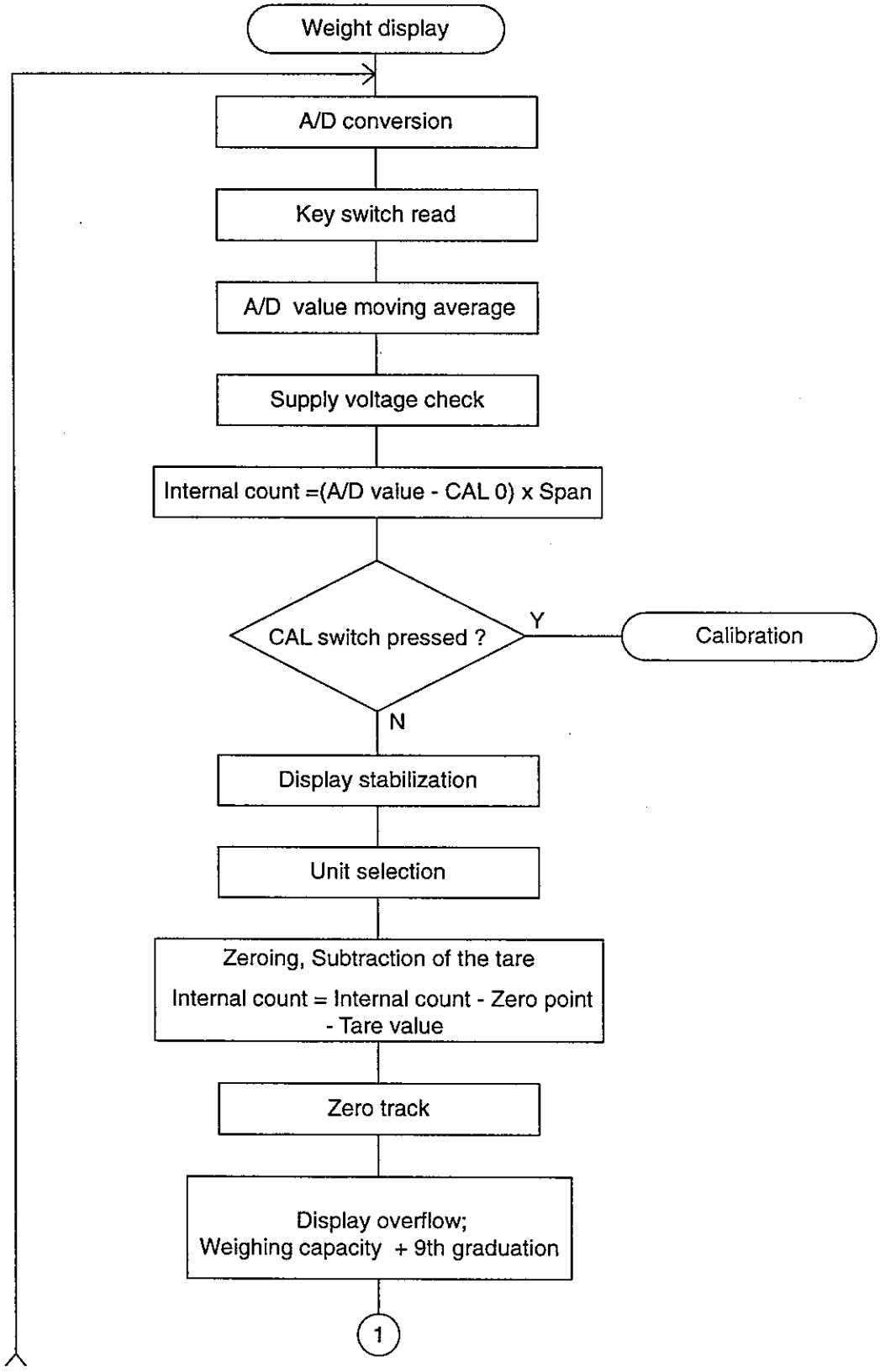
(6) When the data has stabilized, the power-on zero point is established and the weight display procedure starts. The power-on zero point can be established within ± 10 % of the weighing capacity from the zero point value established during calibration. A dash display (- - - - -) appears when this range is exceeded.

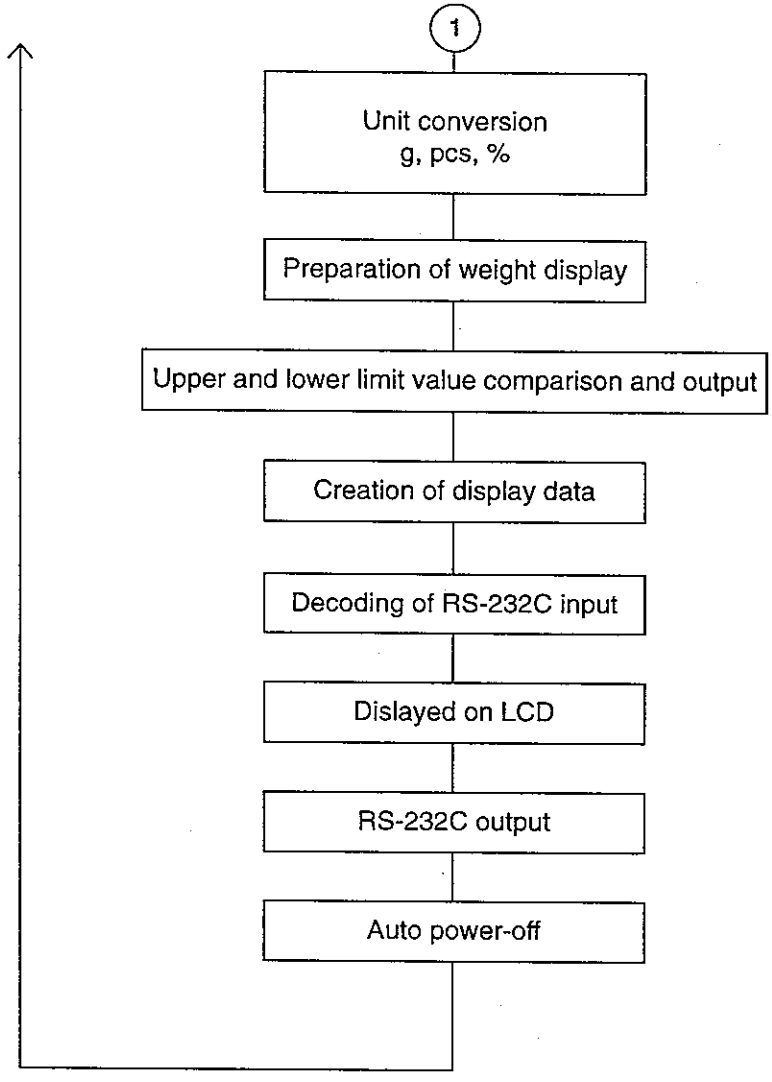
(7) When the [MODE] switch is pressed here, the weight display procedure starts without waiting for stabilization or assuming the power-on zero point.

This is used to display a weight value when the weight display procedure does not readily start or the dash display appears. It is also used to determine how much the zero point has deviated.

3. Normal Operation

3-1 Flow Chart




1
Unit conversion
g, pcs, %
Preparation of weight display
Upper and lower limit value comparison and output
Creation of display data
Decoding of RS-232C input
Dislayed on LCD
RS-232C output
Auto power-off

3-2 Description of Normal Operations

(1) Analog to digital conversion (A/D).
   1) A voltage input from the load cell is converted to digital data.

(2) Reading the key switch
   1) The key switch input is directly read at a CPU port.
   2) The key switch read timing is about 6 times for each sampling at adequate intervals.
   3) Whether the key switch is pressed or not is determined when 2 read time states are the same.

(3) Averaging the A/D raw data
   1) Once within the average width, moving average is implemented up to 16 times (about 3.2 seconds [1]). When beyond the average width, the moving average is re-implemented, starting with the first average width.

(4) Low battery level detection.
   1) Pin No. 24 of the CPU is monitored for a Low level.

(5) Establishing the internal count
   1) The following calculations are made to establish an internal count.
      (Internal count) = [(Averaged A/D raw data) - (Calibration zero point)]
      x(Calibration span)
   2) Thus the computed internal count is a value 5 times greater than a displayed one.
   3) With this 5-fold value, the following processing is done.

(6) Determining stabilization of the display
   1) The display should be within ±0.5 graduation during 5 samples (about 1 second).

(7) Selecting the unit
   1) When the [MODE] switch is pressed, the displayed weighing unit is changed.

(8) Zeroing and subtracting the tare
   1) Pressing the [ZERO] switch when the display is stable, clears the display to zero by zeroing or subtracting the tare. If the display is not stable, pressing the [ZERO] switch is ignored.
   2) Zeroing is done when within ± 2 % of the weighting capacity from the power-on zero established value, and the tare is subtracted when beyond this range. Which has been selected is shown by the "◄" mark displayed on the left side in the LCD.

(9) Zero track
   1) This function pursues slow deviation of the zero point so that weighing can always start at zero accurately.
   2) To actuate the zero track function, the display should be within ± 0.5 graduation during 5 samplings.
   3) The zero track effective range is the same as the zero point range(weighing capacity ± 2 %).

(10) Checking over-range.
1) "E" is displayed when a weight value exceeds the weighing capacity + 9th graduation.
2) "-E" is displayed when the weight value is negative more than 2 % of the weighing capacity.

(11) Changing the weighing unit.
1) The weighing unit is changed to the one determined in (7) Selecting the unit.
2) The units include ounce(oz), pound(lb), troy ounce(ozt), carat(ct), momme, pennyweight(dwt), grain(GN), Singapore and Hong Kong (general) tael(tl), Hong Kong(jewels) tael(tl), Taiwan tael(tl), don, and Chinese tael(tl).

(12) Creating the display data
1) A unit changed value is given a determined software jump number and decimal place to display a weight.

(13) Comparator output
1) When comparator output has been selected by the function, the display data and upper-/lower-limit value are compared and the results are displayed.
2) When an optional interface(EKW-04G) is attached, it is possible to output the comparison result and sound a buzzer.

(14) Data conversion
1) The data has been treated as binary(BIN) numbers so far. Now, they are converted into decimal(DEC) numbers.

(15) Serial data input check
1) When the RS-232C is set to the command mode, the CPU checks whether a command has been input. When it has been input, it is implemented.
2) When the [PRINT/ENTER] switch is pressed, the CPU will output the serial data.

(16) Display
1) The data to be displayed on the LCD is assembled by the CPU. To display 10 g, for example, "1" is illuminated in the 2nd digit of the LCD, "0" in the 1st digit, followed by "g" as a unit.

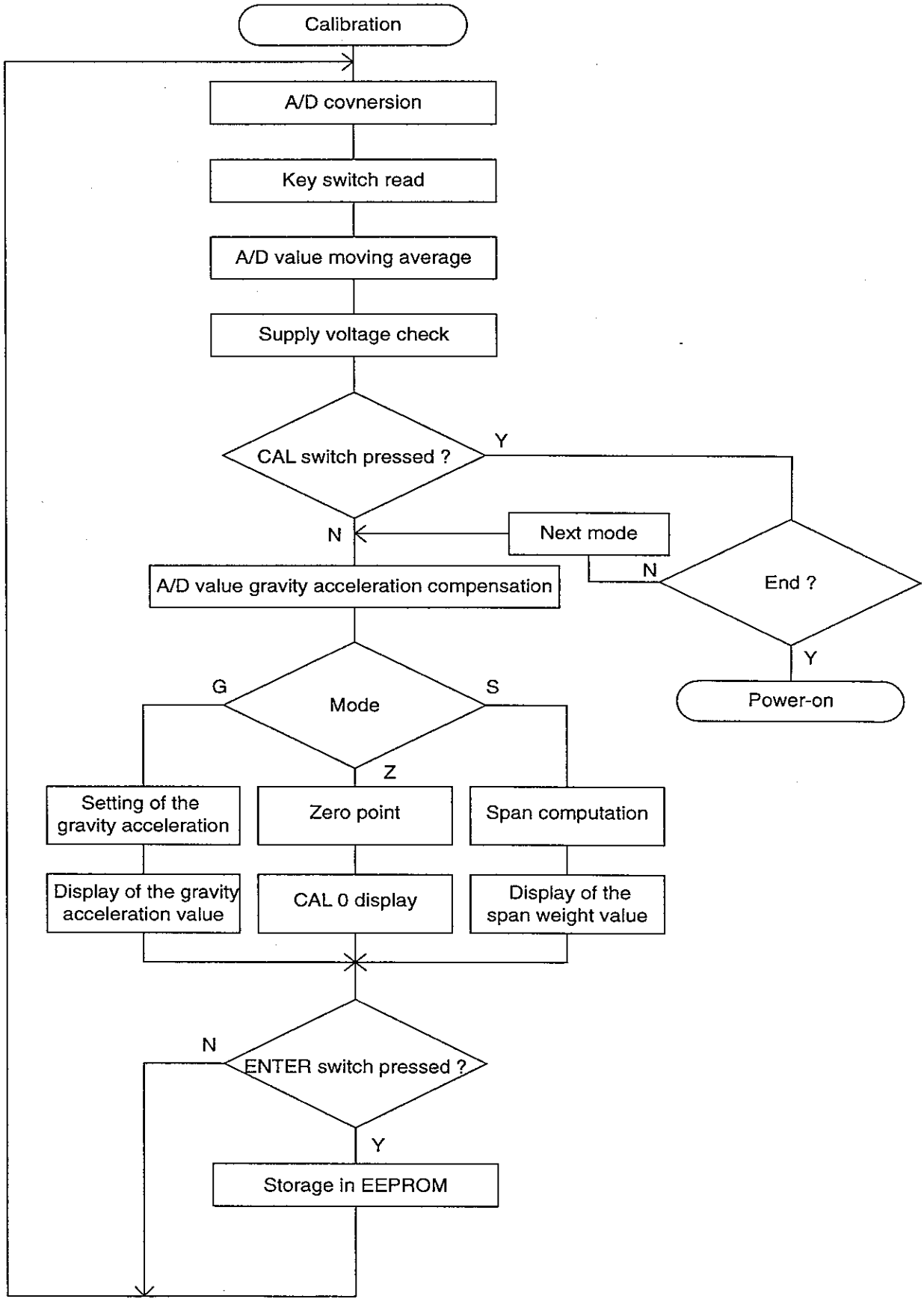
(17) Serial data output
1) The RS-232C data is output at all times when the stream mode is selected. If the command mode is selected, the data is only output if a command is received to output the data, or the print button is pressed.

(18) Auto power-off
1) When the auto power-off function has been selected, auto power-off will operate.
2) When "0" is continuously displayed for approximately 5 minutes [1], the power goes off automatically.
3) When the low battery level is indicated, auto power-off operates.

*1: Differs slightly depending on the magnitude of load cell output.

4. Calibration

4-1 Flow Chart



4-2 Description of the Calibration Sequence

(1) When the [CAL] switch is pressed while in the weighing mode, the calibration mode is selected. During a display check at power-on time, the calibration mode is not entered even if the [CAL] switch is pressed.

(2) Once in the calibration mode, no serial or comparator data is output.

(3) First, gravity acceleration is displayed. Enter the gravity acceleration for the area where the calibration will be performed (where you are now). Based on the value entered here, the zero point and span are compensated. If you enter the correct value, for the area of use, you do not have to recalibrate the zero point or span when using the instrument in a different district, simply adjust setting of the gravity acceleration. When an incorrect value is entered, you have to readjust the zero point or span.

(4) Since the gravity acceleration, zero point, and span are stored when the [PRINT/ ENTER] switch is pressed, they are not lost even if you turn off the power after the display is changed.

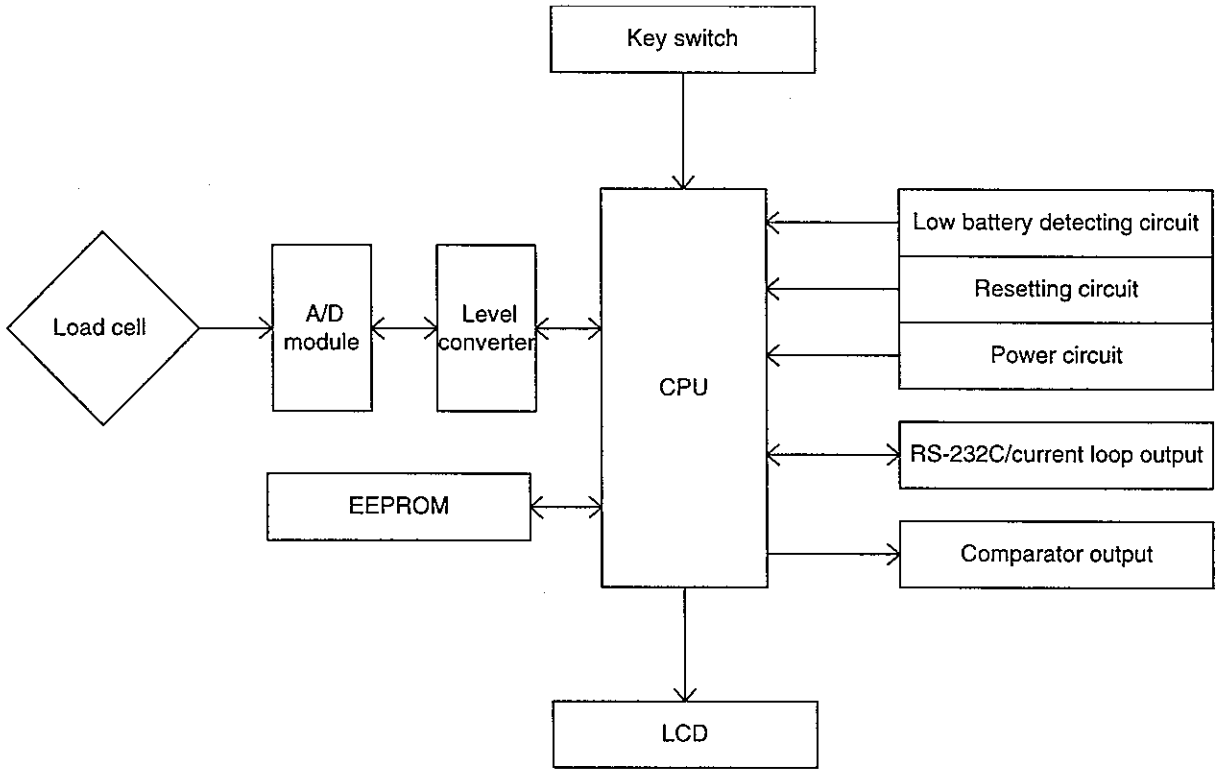
(5) Although a weight value can be altered during span adjustment, it should equal to the weighing capacity or a minimum of two thirds of the weighing capacity. If lower than two thirds of the weighing capacity is used, the error becomes larger near the maximum weighing capacity. If greater than the weighing capacity, a load cell stopper may come into contact, causing an incorrect value to be stored as the span value. It could also cause damage to the load cell.

(6) The span is calculated as follows:

Span = Internal counts ÷ (A/D raw data with the weight placed - Zero point raw data)

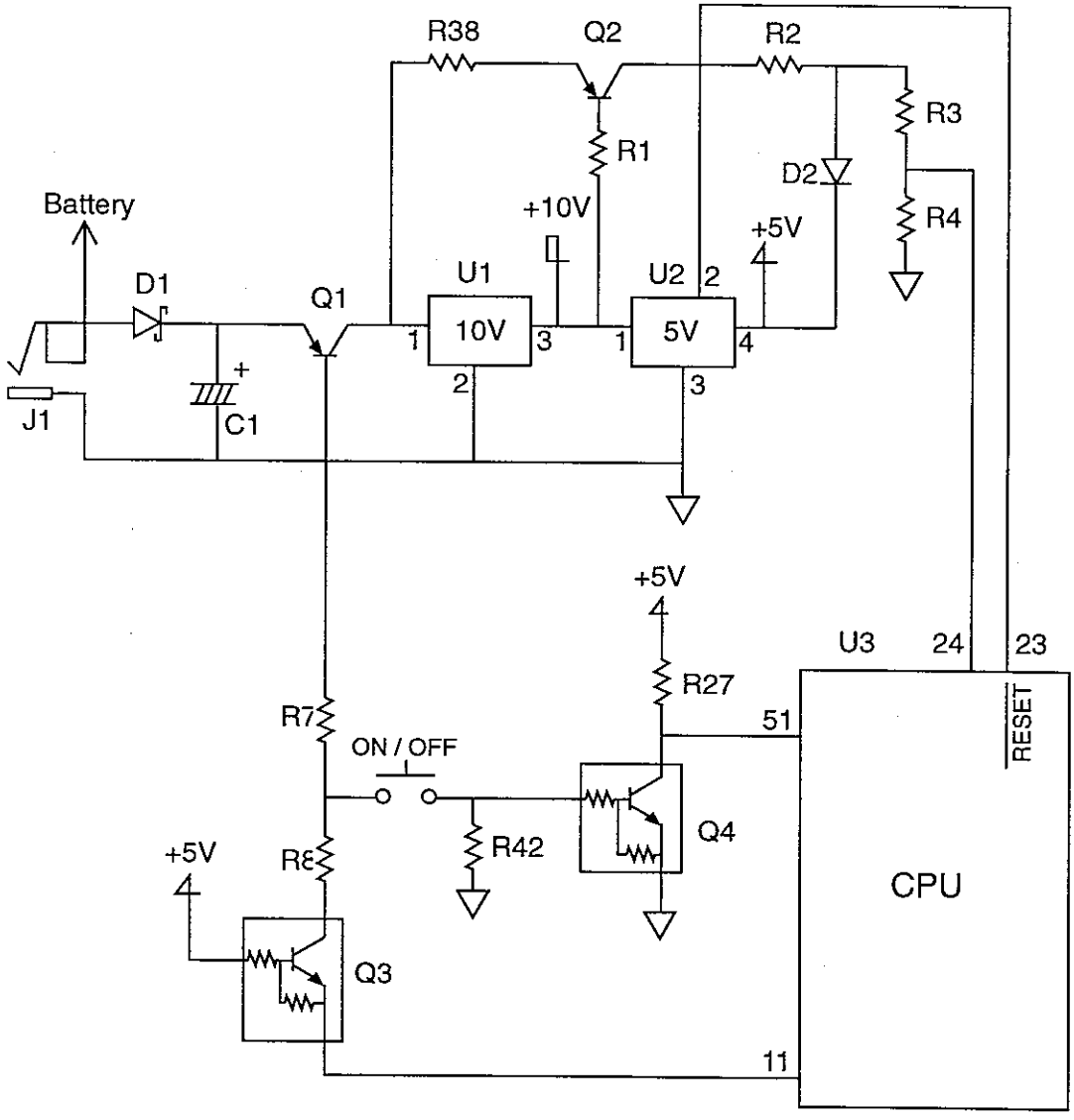
III. DESCRIPTION OF CIRCUITS

1. Block Diagram

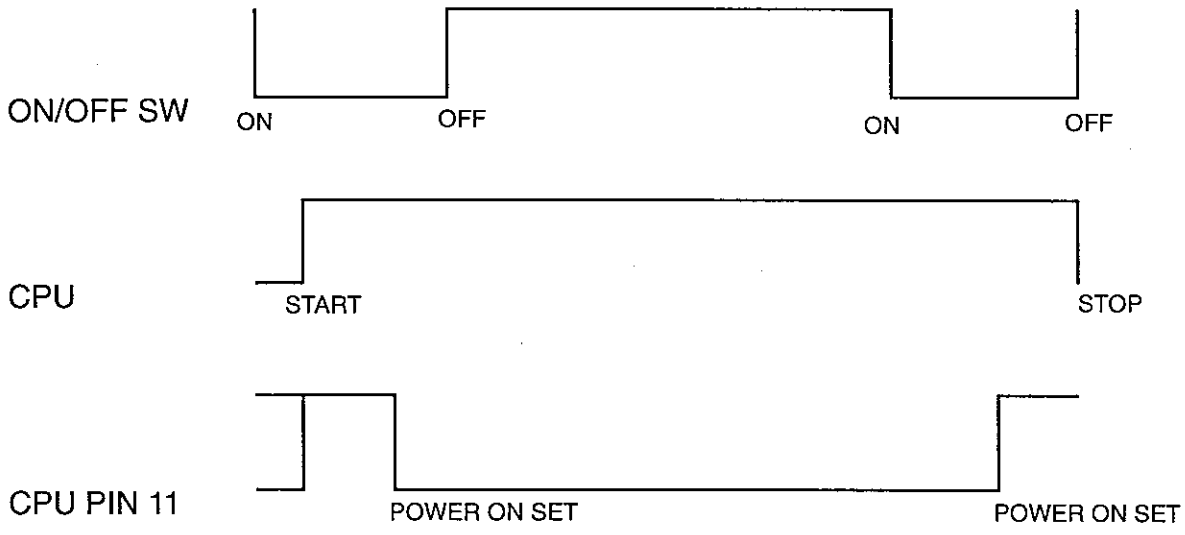


2. Power Circuit

2-1 Circuit Diagram



2-2 CPU Power Timing Chart



2-3 Description of CPU Timing

(1) Press the [ON/OFF] switch.

(2) A bias current starts flowing to Q1, and U1 and U2 are actuated to supply current throughout the circuit.

(3) The CPU(U3) starts conducting and sets pin No. 11(of the CPU) to the Low level.

(4) Q3 starts conducting and continues to supply the bias current to Q1.

(5) Since Q3 is conducting, the current flows even if the [ON/OFF] switch is released.

(6) When turning off the power, the CPU detects that the [ON/OFF] switch is pressed again, and sets pin No. 11 of the CPU to the High level.

(7) Although Q3 stops conducting, the power has not been turned off yet while the [ON/OFF] switch is being pressed, because Q1 is still conducting.

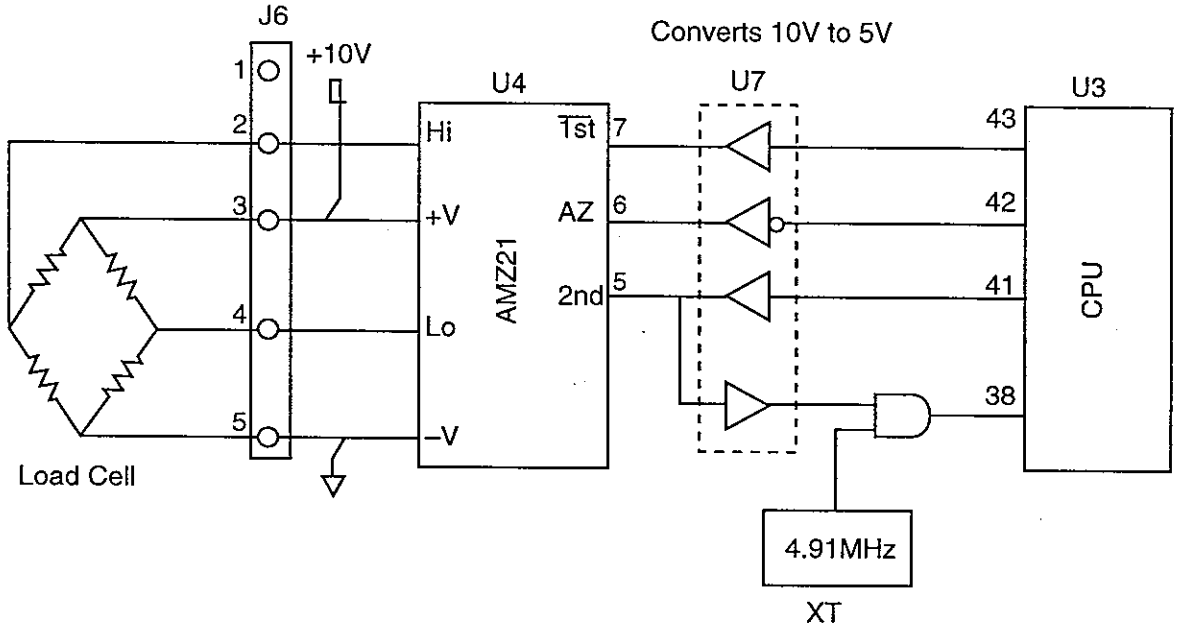
(8) Releasing the [ON/OFF] switch stops Q1 conduction and turns off the power.

(9) The RESET circuit uses a function built into U2. When the input voltage to U2 is lowered to about 4.7V, a reset signal is applied to the CPU.

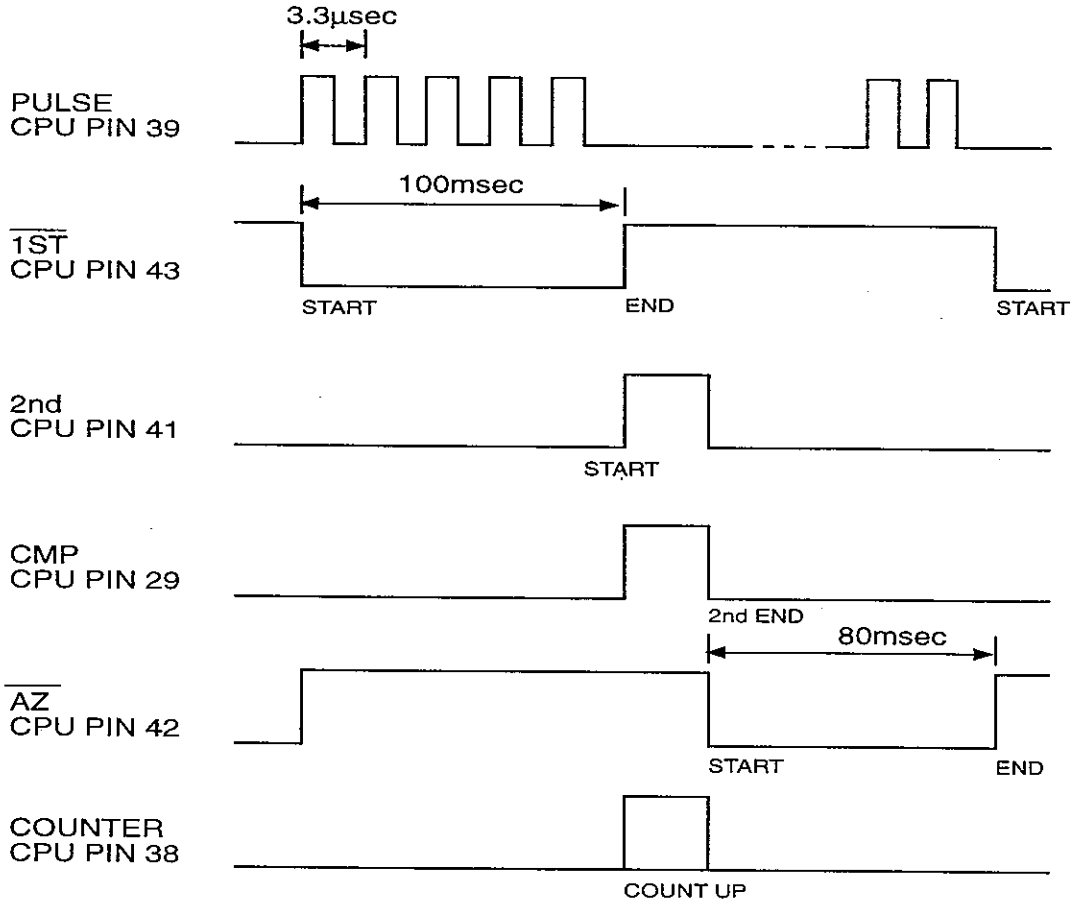
(10) When an input voltage is 10.7 V or less, Q2 stops conducting, the current does not flow through R3 and R4, and pin No. 24 of the CPU is set to the Low level.

3. A/D Circuit

3-1 Circuit Diagram



3-2 Timing Chart



3-3 Description of Analog to Digital Circuit Operation.

(1) The 1st signal is input. The CPU's pin No. 43 is set to the Low level.

(2) The time of the 1st signal is measured. Pulses are output from the CPU's pin No. 39 and input into pin No. 30. The number of pulses are counted and the CPU counter is set so that the time will be 100 msec.

(3) When the CPU counter overcounts and is finished with the 1st signal, the 2nd signal is input. The CPU's No. 43 and 41 pins are set to the High level.

(4) The gate(U6) is opened and a signal from a ceramic oscillator is input to the CPU's pin No. 38. The time of the 2nd signal ranges from 0 to 107 msec depending on the voltage input from the load cell.

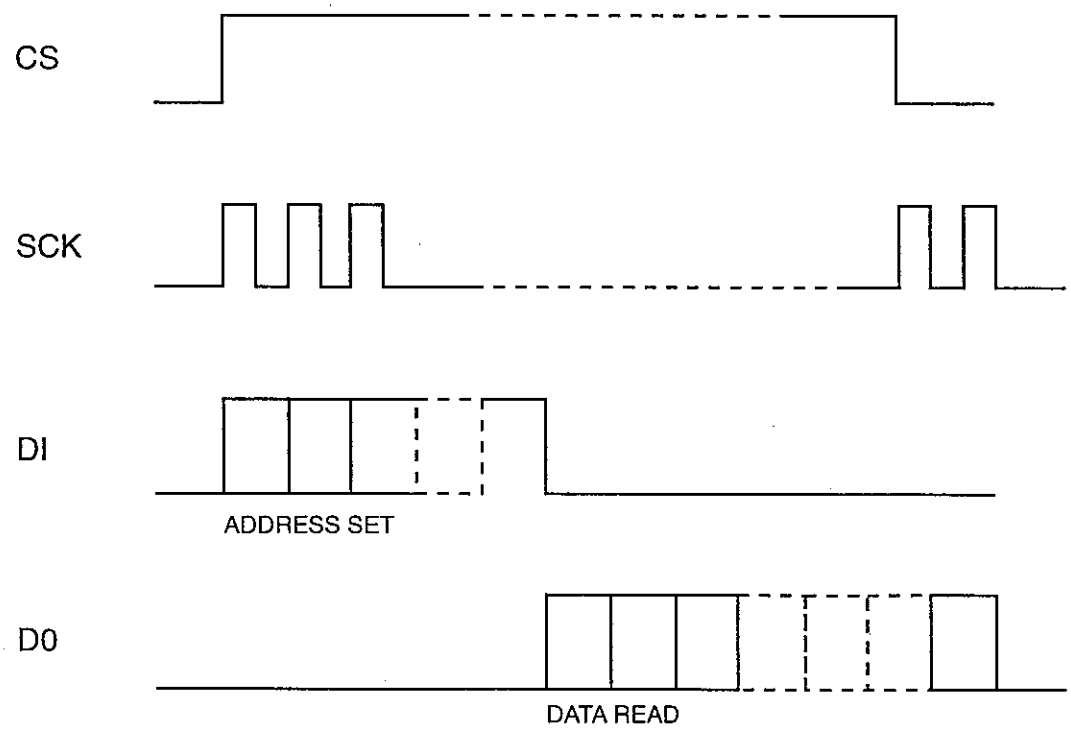
(5) When the 2nd signal is finished, pin No. 5 (2nd terminal) of the AMZ21 is set to the Low level, an external interrupt is input to the CPU, and the gate is closed to stop the signal input from the ceramic oscillator.

(6) When an interrupt is input to the CPU, the 2nd signal is stopped and an AZ signal is input. Pins No. 41 and 42 are set to the Low level.

(7) The time of AZ is measured. Set 80 msec in the same manner as in (2).

4. External Memory

4-1 Timing Chart (Read-out)



4-2 Description of External Memory Operation

(1) An EEPROM is used as the external storage device. The storage capacity is 1 kilo bit.

(2) The data stored includes the following:

1. Gravity acceleration value
2. Calibration zero point
3. Calibration span
4. User functions(F1 to F5)
5. Factory settings(CF1 to CF5)
6. Unit assumed at power-on time
7. Unit used
8. Upper- and lower-limit values of the comparator
9. The number of sample pieces and sample weight registered
10. 100% weight registered

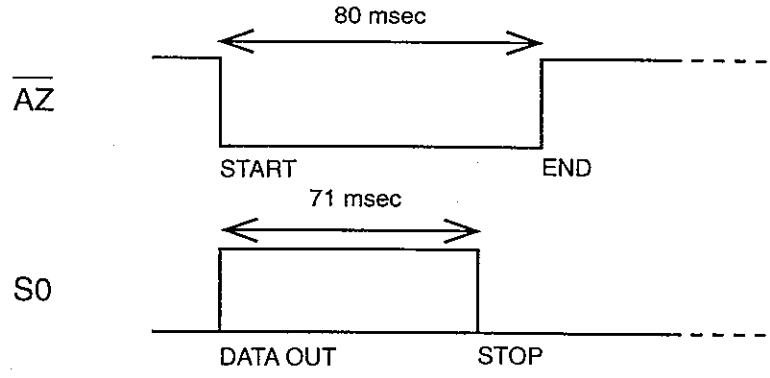
(3) If the EEPROM(U5) is replaced at repair time, it is necessary to redo all of the settings.

(4) When the [PRINT/ENTER] switch is pressed during each setting, that value is entered. To confirm whether the data is correctly entered, read it out immediately after entering it to compare. When the compared data does not match, "Err 8" is displayed.

(5) When you want to read out the data, turn on the power and do so before a display check is effected.

5. Serial Data Output

5-1 Timing Chart (Transmission)



5-2 Description of the Serial Data Output.

The serial data is transmitted when an A/D converted AZ signal is input.

6. Display Circuit

6-1 Description of the Display Circuit Operation

(1) The display on the LCD is directly controlled by the CPU.

(2) The LCD is a custom product of A & D.

(3) The display specifications are 1/3 duty and 1/3 bias.

(4) The following table shows the display segments.

Pin No.	1	2	3	4	5	6	7	8	9	10	11
COM3	COM3			○			-	(			-
COM2		COM2		-	◀ T	)	-	(	ACAI	)	-
COM1			COM1	◀ B	◀ M	)	-	.	,	)	-
digit				11			10		1	9	
CPU	7	6	5	4	3	2	1	80	53	79	78

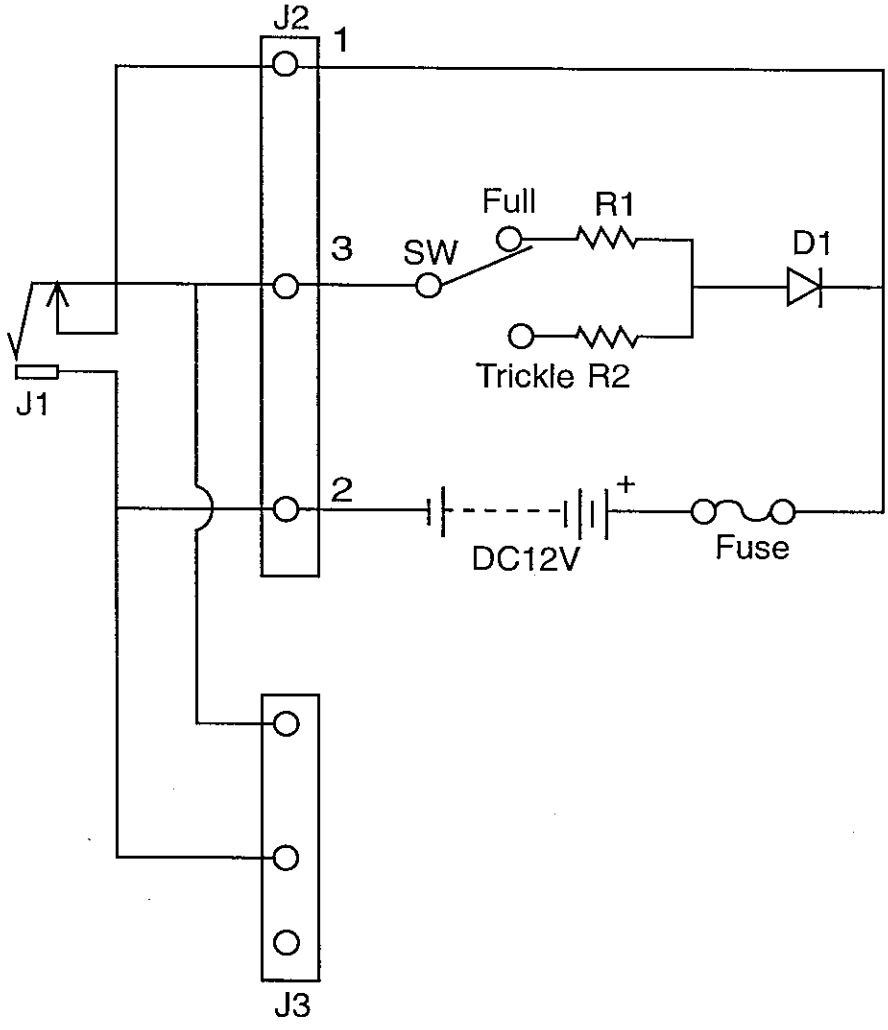
Pin No.	12	13	14	15	16	17	18	19	20	21	22
COM3	(			-	(			-	(		
COM2	(	*	)	-	(	HI	(	-	(	OK	(
COM1	.	,	)	-	.	,	(	-	.	,	(
digit	9	1		8		1		7		2	6
CPU	77	54	76	75	74	55	73	72	71	56	70

Pin No.	23	24	25	26	27	28	29	30	31	32	33
COM3	-	(			-	(		oz	t	l	pcs
COM2	-	(	LO	(	-	(	⌜	lb	%	dwt	GN
COM1	-	.	,	(	-	.	⌟	k	g	ct	mom
digit	6		2	5			2	4		3	
CPU	69	68	57	67	66	65	58	63	62	60	59

Pin No.	34	35	36
COM3			COM3
COM2		COM2	
COM1	COM1		
digit			
CPU	5	6	7

7. Battery Option Charging Circuit

7-1 Circuit Diagram



7-2 Description of the Battery Charging Circuit Operation

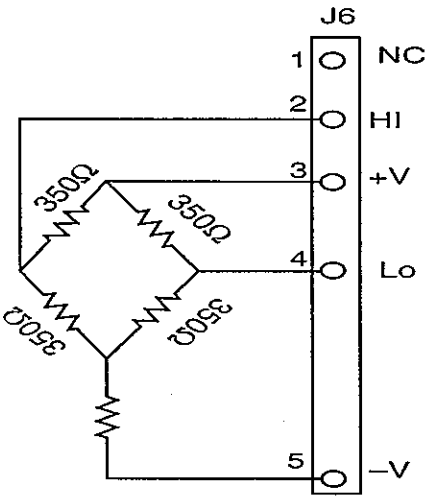
(1) When the main board has been turned on, most the current from AC adapter is taken by the main board.

(2) When the main board is turned off, the current flows to the battery to charge it.

(3) When the AC adapter is not attached, power is supplied from the battery to the main board via J1.

8. Load Cell

8-1 Circuit Diagram



8-2 Specifications(LC116 Series load cells)

1) Zero : 0 mV/V + 20 % (When the weighing pan is installed)
2) Span : 1 mV/V ± 10 %
3) Impedance : 350Ω
4) Pin connection :

1 = No connection (NC)
2 = Plus side of the load cell output (HI)
3 = Plus side(10 V) of the applied voltage (+V)
4 = Minus side of the load cell output (Lo)
5 = Minus side(GND) of the applied voltage (-V)

8-3 Mounting of Load Cell

Model		Type of cell / Capacity	Tightening torque (kg)	Stopper adjustment (mm)
EK	120G	LC:116-300/300g	10	0.8
	200G			
	600G	LC:116-600A/600g		1.0
	1200G	LC:116-2k/2kg		1.2
	2000G			
	6000G	LC:116-6k/6kg	28	1.3
	12KG	LC:116-12k/12kg		
EW	60G	LC:116-300/300g	10	0.8
	300G	LC:116-600A/600g		1.0
	600G			
	3000G	LC:116-6K	28	1.3

IV. CHECK MODE

1. Entering the Check Mode

(1) Holding down the [CAL] switch, press the [ON/OFF] switch to turn on the power.

(2) "P-X.XX" is displayed to indicate that you have entered the check mode.

2. Software Version Display

(1) What is displayed upon entering the check mode is a software version;

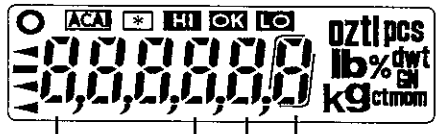
"P-2.00"etc.

(2) When terminating, turn off the power. To make an LCD & input/output check, press the [MODE] switch.

3. LCD & Input/Output Check

(1) After entering the check mode, press the [MODE] switch again. All the segments are turned on.

(2) The display changes only when a switch is pressed (see below).



Display	Switch	Comparator Output
7	[SAMPLE]	HI
b	[PRINT/ENTER]	OK
d	[MODE]	LO
-	[ZERO]	Buzzer sounds
7	[CAL]	Stable
b	[ON/OFF]	
0	Parts SCK, S0 and Si are shorted	
1	Parts SCK, S0 are shorted	
2	Parts SCK, Si are shorted	
4	Parts S0 and Si are shorted	
1	The low battery detecting circuit is at the Low level.	

(3) When terminating, turn off the power. To make a display pattern check, press the [MODE] switch.

4. Display Pattern Check

(1) After entering the check mode, press the [MODE] switch twice.

(2) All the display digits sequentially repeat the following display pattern at the same time at intervals of about 0.8 second."0 →1 →2 →3 →4 →5 →6 →7 →8 →9 →A →b →C →d →-→,"

(3) When terminating, turn off the power. To view the A/D count, press the [MODE] switch.

5. A/D Count Display

(1) After entering the check mode, press the [MODE] switch three times.

(2) A numerical value is displayed, where the 1st-digit number is enclosed by the parentheses. (Counts up to about 200,000 with 1 mV/V input)

(3) When moving average is implemented 16 times, the stabilization mark "O" is displayed.

(4) When the [ZERO] switch is pressed, the display is cleared to 0. However, it is reset when the internal count display is selected.

(5) The RS-232C output is made.

(6) When terminating, turn off the power. To view the internal count, press the [MODE] switch.

6. Internal Count Display

(1) After entering the check mode, press the [MODE] switch four times.

(2) A numerical value is displayed, where the 1st-digit number is not enclosed by the parentheses. (5 times larger than the display)

(3) When moving average is implemented 16 times, the stabilization mark "O" is displayed.

(4) When the [ZERO] switch is pressed, the display is cleared to 0. However, it is reset when the A/D count display is selected.

(5) The RS-232C output is made.

(6) When terminating, turn off the power.

Pressing the [MODE] switch again takes you to the A/D count display.

V. MAIN BOARD INITIALIZATION

1. Initial Values

When the board is initialized;

CF1=0	F1=0
CF2=1	F2=1
CF3=0	F3=0
CF4=0	F4=0
CF5=0	F5=0
	* F6=0

** F6 is only available for the P-2.00 version ROM.*

F6 is the function for factory use. Do not change the data.

2. Initialization Method

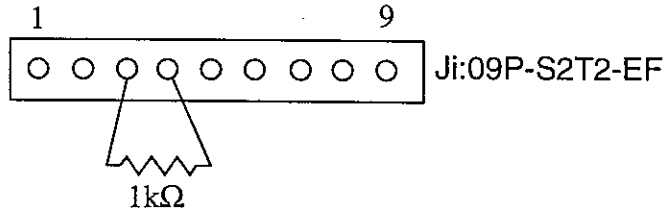
(1) Connect the No. 3 and No. 4 pins of the option connecting cable by means of a 1 kΩ resistance.

(2) Holding down the [CAL], [ZERO], and [PRINT/ENTER] switches, press the [ON/OFF] switch to turn on the power.

(3) "init" is displayed for a moment then replaced by "End." When "Err 8" is displayed, it indicates that the data was not correctly written into the EEPROM.

(4) Turn off the power to terminate.

3. Optional Connecting Cable Shorting Jig



VI. ADJUSTMENT OF THE PRODUCT

1. Internal Setting

Functions of Switches

[CAL] : Proceeds to the next function, leaving a set values as it is.
[PRINT/ENTER] : Stores a new set value and proceeds to the next function.
[SAMPLE] : Increments the set value by 1.
[MODE] : Decrements the set value by 1.
[ZERO] : Clears the set value to zero(0).

(1) Connect the No. 3 and No. 4 pins of the option connecting cable using a 1 kΩ resistor.

(2) Holding down the [CAL] and [ZERO] switches, press the [ON/OFF] switch to turn on the power. "CF1 ?" is displayed.

(3) When you want to leave the set value as it is, press the [CAL] switch to proceed to the next function.

(4) When you want to alter the set value, use the [SAMPLE], [MODE], and [ZERO] switches to set the value shown in Table 1. When here is a remodeling code, remodel as shown in Table 2.

(5) Press the [PRINT/ENTER] switch to store. When "Err 8" is displayed, it indicates that the data was not correctly stored in the EEPROM.

(6) When all settings are completed, "End" is displayed.

(7) Turn off the power to terminate.

Table 1

EK-G/EW-G Internal Settings

ROM Version P-1.10, p-2.00 * F6 is only available for P-2.00 ROM

	CF1	CF2	CF3	CF4	CF5	F1	F2	F3	F4	F5	*F6	Remarks
EK120G	0	1	2	0	2	0	1	0	0	0	0	
200G					3							
600G			1		1							
1200G					2							
2000G					3							
6000G			0		1							
12KG					2							
EW60G			2	1	0							
300G			1	0								
600G				1								
3000G			0	0								

Table 2

Alterations of Internal Settings by Remodeling Codes

ROM Version P-1.10, P-2.00

Remodeling Code \ Function Altered / Model		EK							EW				Remarks
		120G	200G	600G	1200G	2000G	6000G	12KG	600G	3000G	600G	3000G	
*0001	None	As per Table 1											g,pcs,%," ,"
*0002	CF3	A		9			8		A	9		8	g,pcs,%," ,"
*0003	CF2	4											g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,"."
*0004	CF2	4											g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,"."
*0005	CF2	5											g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,tl1,"."
*0006	CF2	6											g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,tl2,"."
*0007	CF2	N/A		7	N/A		7	N/A		7			g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,tl3,"."
*0008	CF2	4											g,pcs,%,oz,lb,ozt,ct, mom,dwt,GN,","
	CF3	A		9			8		A	9		8	

tl1=Hong Kong (general)/Singapore tael
tl2=Hong Kong (jewelry) tael
tl3=Taiwan tael
N/A=Not applied

2. Calibration

Functions of Switches

[CAL] : Proceeds to the next without changing the setting.
[PRINT/ENTER] : Stores a new value and proceeds to the next.
[SAMPLE] : Increments a blinking value.
[MODE] : Shifts a blinking digit to the right by one digit.
[ZERO] : None

(1) Press the [ON/OFF] switch to turn on the power. After two seconds, press the [MODE] switch to select the weight display mode.

(2) Apply a preliminary load, using a weight about twice larger than the weighing capacity. (This weight will be removed in step 5)

(3) In this state, warm up the instrument for 10 minutes. This should be done carefully for the EK120G and EK200G.

(4) Press the [CAL] switch to enter the calibration mode. "9. XXX" is displayed.

(5) Enter the gravity acceleration value of where you are now. If you enter the correct value for your location, you do not have to readjust the zero point or span when using the instrument in a different location, simply alter the gravity acceleration to the correct value for that location.

(6) Proceed to the zero point. "CAL 0" is displayed.

(7) With nothing on the weighing pan, press the [PRINT/ENTER] switch to set the zero point when the stabilization mark appears.

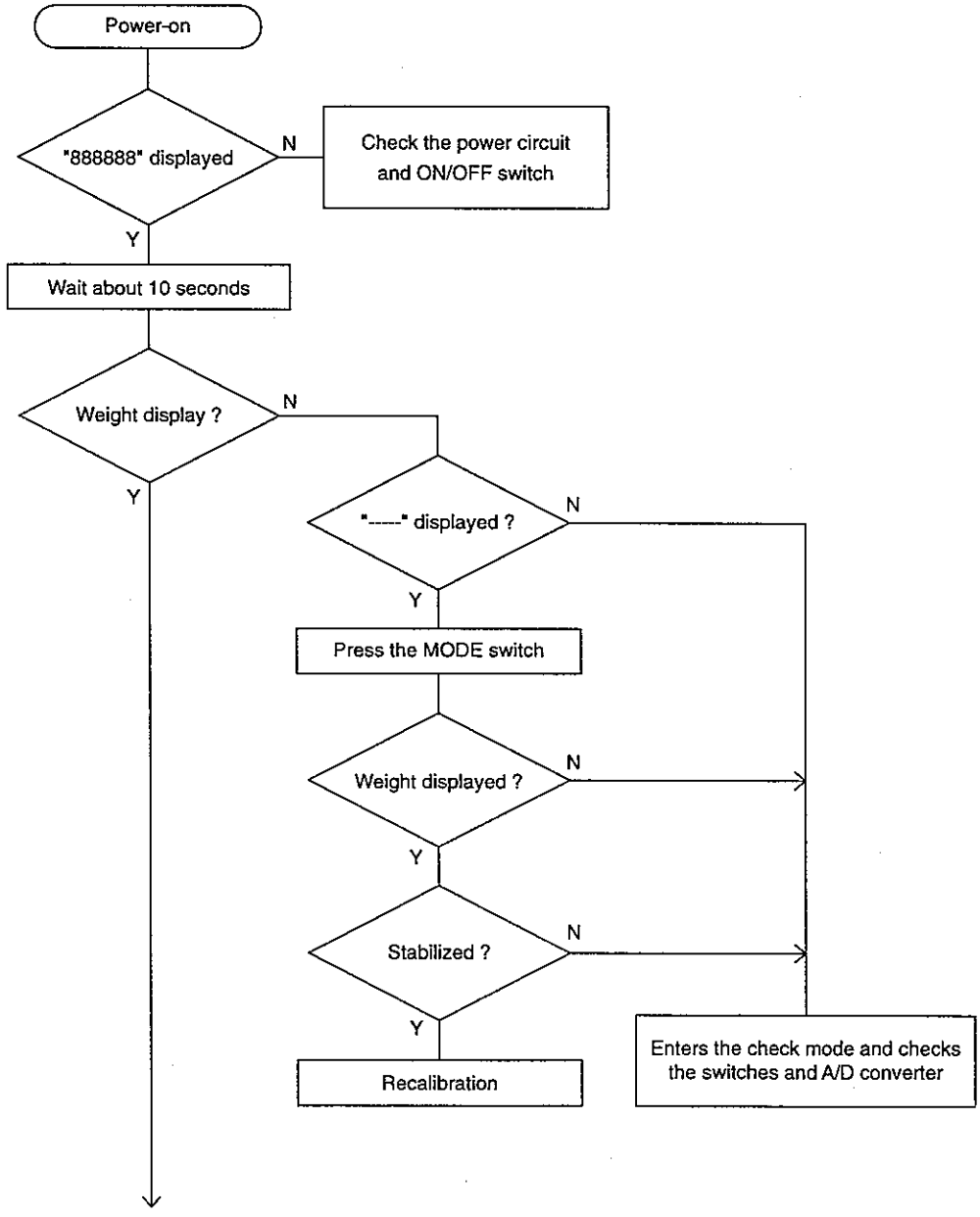
(8) Proceed to span. The calibration weight is displayed.

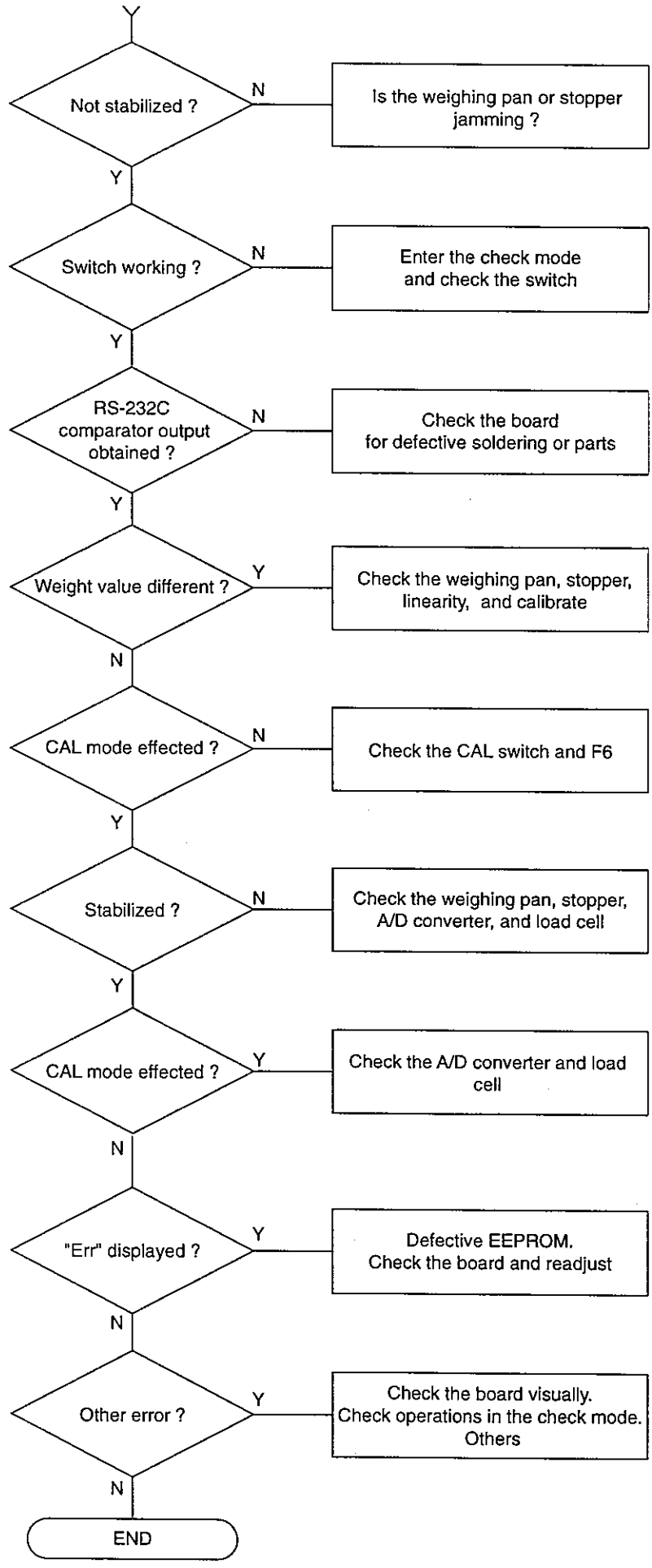
(9) Put the weight which equals a displayed value(g). When the stabilization mark is displayed, press the [PRINT/ENTER] switch to assume the span. Although the weight value can be altered, use it as it is as much as possible.

(10) End of calibration. When "End" is displayed, press the [CAL] switch to terminate calibration.

VII. TROUBLESHOOTING

1. Flow Chart




Y
Not stabilized ?
N
Is the weighing pan or stopper jamming ?
Y
Switch working ?
N
Enter the check mode and check the switch
Y
RS-232C comparator output obtained ?
N
Check the board for defective soldering or parts
Y
Weight value different ?
Y
Check the weighing pan, stopper, linearity, and calibrate
N
CAL mode effected ?
N
Check the CAL switch and F6
Y
Stabilized ?
N
Check the weighing pan, stopper, A/D converter, and load cell
Y
CAL mode effected ?
Y
Check the A/D converter and load cell
N
"Err" displayed ?
Y
Defective EEPROM. Check the board and readjust
N
Other error ?
Y
Check the board visually. Check operations in the check mode. Others
N
END

2. Check Items

If possible enter the check mode to perform these checks.

2-1 Power Check

(1) +10 V(U1)

1) Input voltage = Output voltage + 0.7 V or more. Otherwise, low battery.
2) Output voltage = 10 V ± 1 V

(2) + 5 V(U2)

1) Input voltage = 10 V ± 1 V
2) Output voltage = 5 V ± 0.3 V

(3) Current

12 V DC, 51 mA for the main body only. When the current has a difference of ± 10 mA or more, it is considered abnormal.

(4) Reset output = 5 V

(5) What happens if the [ON/OFF] switch is held down ?

2-2 CPU Check

(1) Power : 5 V at pin No. 33.

(2) Reset : Normally, 5 V at pin No. 24.

(3) Clock : 4.91 MHz for XT

(4) A/D control : Waveform in the A/D circuit timing chart

2-3 LCD and Switches

(1) Since the LCD and switches are directly connected to the CPU ports, make sure that they are free from contact or soldering failure.

(2) Since the [ON/OFF] switch(SW5) is connected to the power circuit, pay attention to the transistors Q3 and Q4 as well.

2-4 A/D

(1) 10 V at the No. 3 pin.

(2) The waveform shown in the timing chart for the A/D circuit is input at 10 V. The AZ waveform is reversed.

2-5 Load Cell

(1) Input voltage(between 5 and 3) = 10 V

(2) Output voltage(between 2 and 4) : Zero = 0 V + 2 mV (with the weighing pan)
Full scale = Zero + 10 mV ± 1 mV

CAUTION : For the next check, remove all power from the circuit (disconnect the AC adapter and battery option (if used).

(3) Resistance value = About 410Ω for the input side, About 350Ω for the output side.

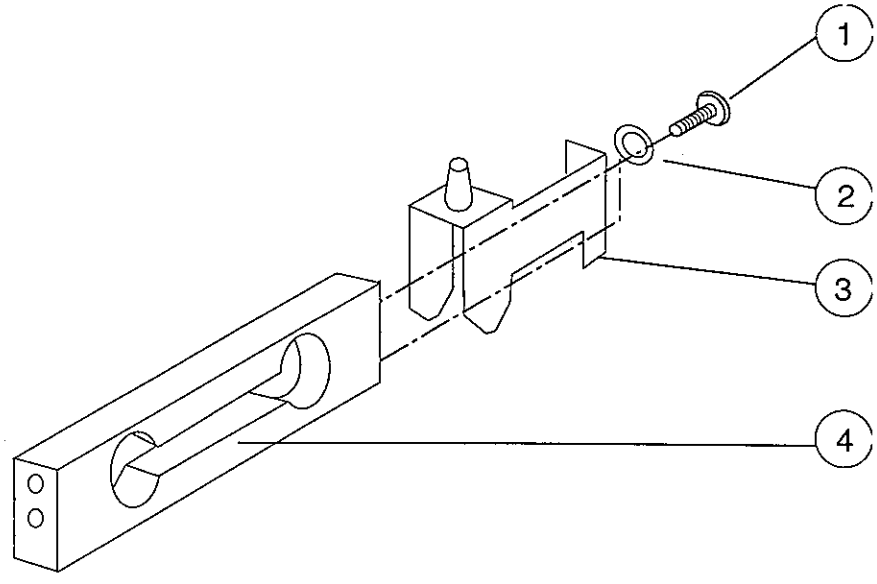
VIII. ASSEMBLY PROCEDURES / Docking of Cell

(1) Affix a load angle to the load cell temporarily. (Screw at 2 places) (3 places for the EW3000, EK6000, and 12K). The screw (1) and washer (2) differ depending on the model used. (Refer to the figure below)

Model	EW60GEK120G EK200G	EW300G EW600G	EK600G EK1200G EK2000G	EW3000G EK6000G EK12KG
Screw	Truss M4 x 8	Pan head screw M4 x 10		Hexagon socket head bolt M4 x 10
Washer	Plain washer (Nylon, M4)			Plain washer(M4) Spring washer(M4)

*The load angle differs depending on the model used.(Refer to the figure below)

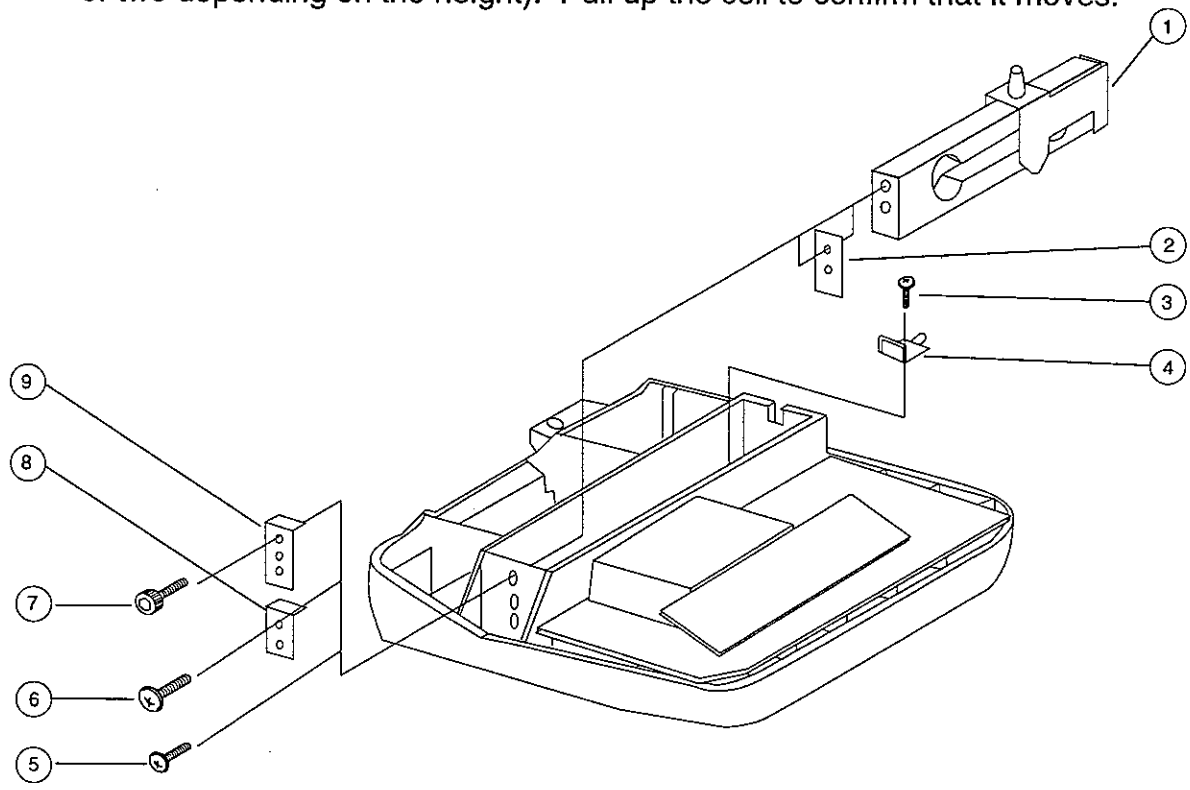
Model	EW60G EK120G EK200G	EW300G EW600G	EK600G EK1200G EK2000G	EW3000G EK6000G EK12KG
Name	Load angle	Load angle		Load angle B
Standard	04:A46310	04:A46311		04:3000117



(2) Attach the load cell to the lower case.(Refer to the figure below)

1) For the EW60G, EK120/200G

- Attach the main board to the lower case. (Align the projections with the holes in the main board and fit in.)
- Place a spacer between the load cell and the load cell mounting section of the lower case(left side of the cell) and attach with two pan head screws M4 x 10. (Make sure that the cell is perpendicular (if not perpendicular, it can cause a 4 corner problem), and tighten with a torque of 10 kgf-cm). Attach the grounding terminal together with the upper screw (closer to the main board).
- The grounding terminal attached to the tip should also be screwed to a 3 mm tap on the left rear of the cell mounting section.
- Insert a 0.8 mm spacer jig under the temporarily mounted load angle and tighten with the proper torque(Refer to Figure on the next page). Push down on the load angle from above and tighten the screws. The angle should be parallel to the guide (if not straight, it can cause a 4 corner problem).
- Attach the upper stopper on the right side of the load cell. When this is done, put a nylon washer(s) in between the upper stopper and mounting section.(One or two depending on the height). Pull up the cell to confirm that it moves.

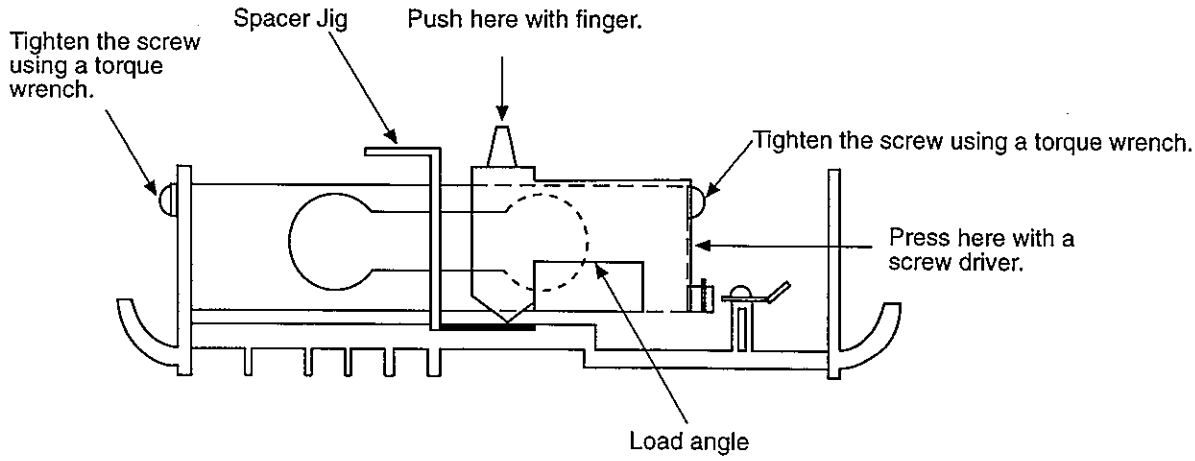


2) For the EW300/600G, EK600/1200/2000G. (Refer to the Load Cell Mounting Drawing on the previous page)

- Attach the main board to the lower case. (Align the projections with the holes in the main board and fit in.)
- Install the stopper plate below the load cell mounting section . (shaped like a round circle with sticky tape on the back).
- Set the load cell in the load cell mounting section, attach the load cell supporters from the front side, and attach with screws. Two pan head screws M4 x 12, tightening torque of 7.10 kgf-cm. Attach the grounding terminal to the upper screw (closer to the main board) and tighten.
- The grounding terminal attached to the tip should be also screwed to a 3 mm tap on the left rear of the cell mounting section.
- Insert a 1.1 or 1.2 mm spacer jig under the temporarily mounted load angle and tighten with a torque(tightening torque of 10 kgf-cm), while pushing on the load angle from above (refer to the drawing below). Use the 1.1 mm spacer jig for the EW300/600G and EK600G, and 1.2 mm spacer jig for the EK1200/2000G.
- Screw the upper stopper to the right side of the load cell (tap M3 x 8). After attaching the upper stopper, pull up on the cell to confirm that it moves.

3) For the EW3000, EK6000G/12KG. (Same procedure except the following)

- The load cell supporters used for attaching the load cell should have 3 holes. To attach them, use a hexagon socket head bolt(M4 x 12) together with a spring washer and plain washer (Screw at 3 places). Attach the grounding terminal to the top one (tightening torque of 28 kgf-cm)
- When tightening the load angle with a torque, use the 1.3 mm spacer jig (tightening torque of 28 kgf-cm).
- The upper stopper is not required.



APPENDIX:A ELECTRONIC PART

PARTS LIST

7PZ:2773-MAIN			
CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2773B	PRINTED CIRCUIT BOARD	1
C2,13,14,16~20,30~34,36~39	CC:0.1U25VT	CAPACITOR 0.1μF 25V	17
C40,42	CC:47PT	CAPACITOR 47pF	2
C6	CK:SME16VB100	CAPACITOR 100μF 16V	1
C1	CK:SME35VB470	CAPACITOR 470μF 35V	1
C3,5,7,9,24,29,35	CT:1V010T	CAPACITOR 1μF 35V	7
D1	DI:SB10-03A2-T	DIODE	1
D2,6~12	DI:1SS270T	DIODE	8
LCD	ED:E-7339	LCD	1
J6	JE:HBLB5S-5J	FPC CONNECTOR	1
J5	JI:09P-S2T2-EF	CONNECTOR	1
J4	JT:171825-3	CONNECTOR	1
JPC	KB:126006BK77	WIRE	1
JPB	KB:126008BK77	WIRE	1
JPA	KB:126013BK77	WIRE	1
	KO:1257-005-06	EARTH CABLE	1
U4	MF:AMZ21	ANALOG MODULE	1
Q2	QT:A1015YT	TRANSISTOR 2SA1015Y	1
Q1	QT:A1020YT	TRANSISTOR 2SA1020Y	1
Q3,4	QT:BA1A4PT	TRANSISTOR BA1A4PT	2
R29,34	RC:NAT1.5KJT	RESISTOR 1.5KΩ 1/4W	2
R1,31,33,39	RC:NAT10KJT	RESISTOR 10KΩ 1/4W	4
R5,6,10~16,38	RC:NAT100RJT	RESISTOR 100Ω 1/4W	10
R32	RC:NAT15KJT	RESISTOR 15KΩ 1/4W	1
R27,28	RC:NAT22KJT	RESISTOR 22KΩ 1/4W	2
R3,7,8,21,42	RC:NAT3.3KJT	RESISTOR 3.3KΩ 1/4W	5
R2,4	RC:NAT33KJT	RESISTOR 33KΩ 1/4W	2
R18~20,22,25,35~37	RC:NAT56KJT	RESISTOR 56KΩ 1/4W	8
R30	RN:IHR-4-103MA	RESISTOR NETWORK	1
R17,23,24	RN:IHR-4-223MA	RESISTOR NETWORK	3
R9	RN:IHR-8-563JA	RESISTOR NETWORK	1
SW1~5	SK:SKHHAK	TACT SWITCH	5
U7	UA:C339C	COMPARATOR	1
U6	UC:HC08	HCMOS IC	1
U5	UC:RP93C46	EEPROM	1
U3	UC:47C820Z-NA15	CPU	1
U1	UR:C2255H	VOLTAGE REGULATOR	1
U2	UR:TA78DL10S	VOLTAGE REGULATOR	1
XT1	XT:KBR4.91MKSTF	CERAMIC OSC	1
	07:4000323	DISPLAY HOLDER	1
	17:13-N3×6B1	TAPPING SCREW	2

PARTS LIST

7PZ:2773-P/S			
CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2773B	PRINTED CIRCUIT BOARD	1
J1	JE:0486-01-010	JACK	1
J2	KO:102-3S20	CABLE	1
J3	KO:1165-03S020	CABLE	1
	LR:R-12A-M-A	LINE FILTER	1
SW6	SK:SKHHAK	TACT SWITCH	1

PARTS LIST

7PZ:2774

CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2774	PRINTED CIRCUIT BOARD	1
D1	DI:F14A	DIODE	1
	EB:10AA600-1053	Nicd BATTERY	1
	FH:85PN0819	FUSE HOLDER	2
	FS:EAWK-315MA	FUSE 315mA	1
J1	KO:102-3S20	CABLE 3P 20cm	1
R2	RC:1/2100R	RESISTOR 100Ω 1/2W	1
R1	RE:MOR2B15RJ	RESISTOR 15Ω 2W	1
S1	SS:SSX-459	SLIDE SWITCH	1

PARTS LIST

7PZ:2775

CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2775	PRINTED CIRCUIT BOARD	1
C2,7	CC:0.1U25V	CAPACITOR 0.1μF 25V	2
C3,4,5,6	CK:SME25VB10	CAPACITOR 10μF 25V	4
C1	CK:SME25VB22	CAPACITOR 22μF 25V	1
J2	JA:17LE-13250	CONNECTOR	1
J1	JI:09P-S2T2-EF	CONNECTOR	1
NF1	NF:D-42C	NOISE FILTER	1
R1	RC:NAT3.3K	RESISTOR 3.3KΩ 1/4W	1
U1	UC:MAX232CPE	RS232C	1
	07:3000119	PANNEL	1
	08:C40927-1	SEAL	1

PARTS LIST

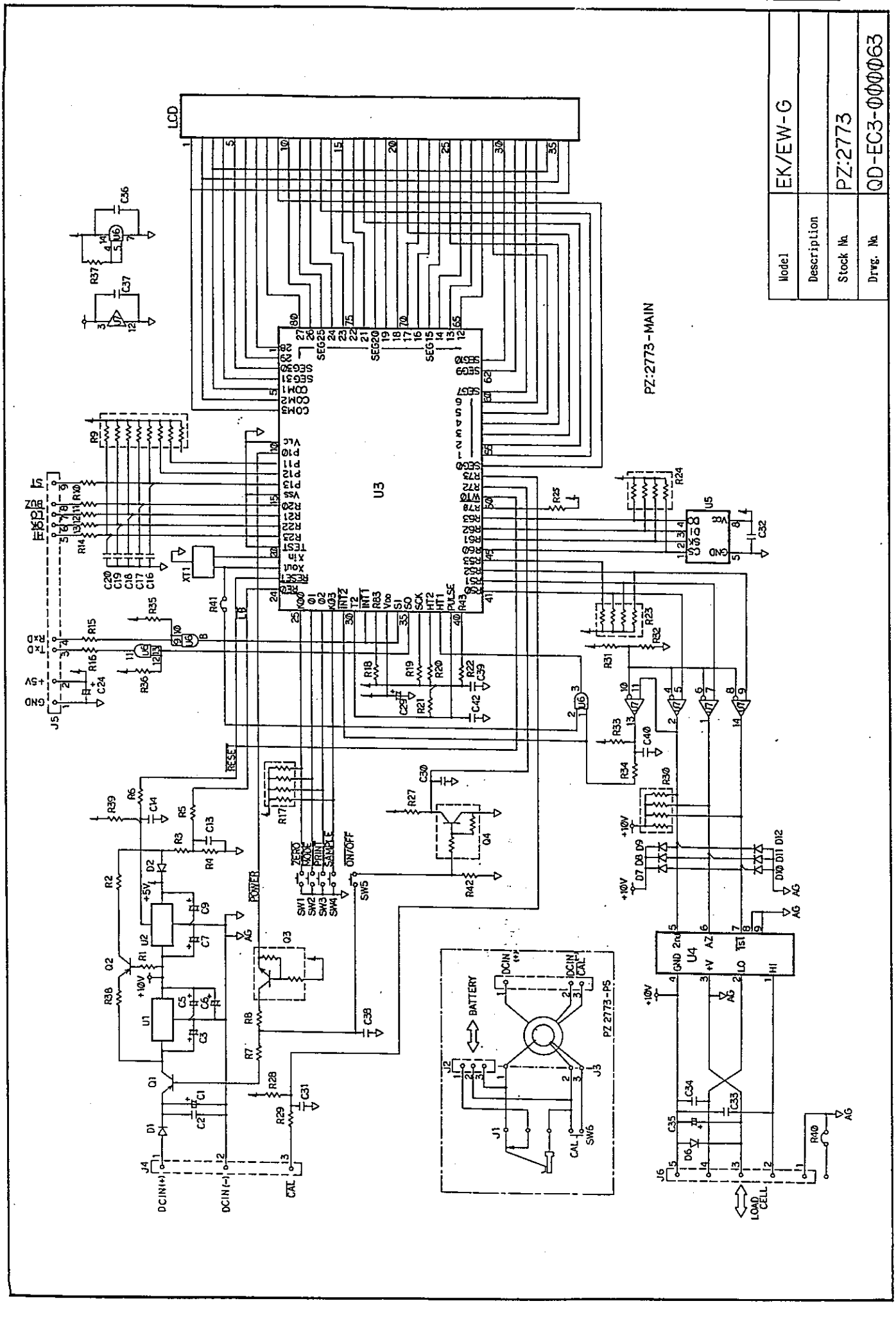
7PZ:2776

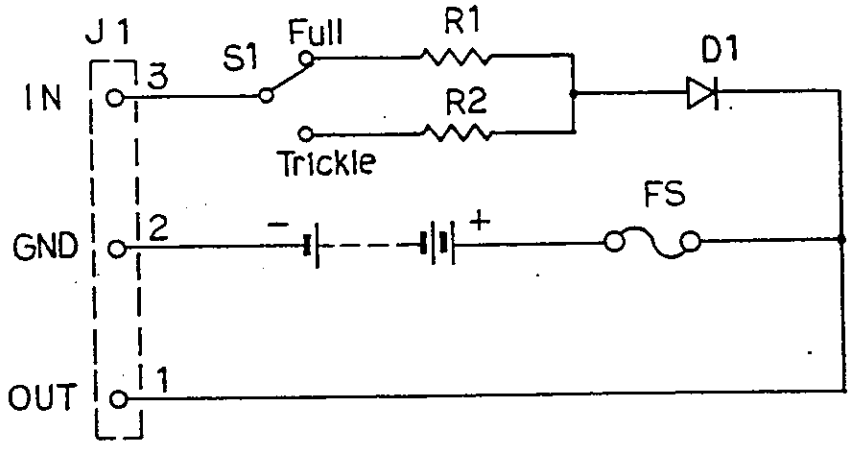
CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2776	PRINTED CIRCUIT BOARD	1
C2	CC:0.1U25V	CAPACITOR 0.1μF 25V	1
C1	CK:SME25VB22	CAPACITOR 22μF 25V	1
PHC1	DF:PS2501-1L/K	PHOTO CUPPLER	1
D1	DI:1B4B42	BRIDGE DIODE	1
J2	JA:TCS5076-17	CONNECTOR	1
J1	JI:09P-S2T2-EF	CONNECTOR	1
Q1	QT:BA1A4P	TRANSISTOR BA1A4P	1
Q2	QT:C1815Y	TRANSISTOR 2SC1815Y	1
R2	RC:NAT1K	RESISTOR 1KΩ 1/4W	1
R1	RC:NAT5.6K	RESISTOR 5.6KΩ 1/4W	1
	07:3000118	PANNEL	1
	08:4001059	SEAL	1

PARTS LIST

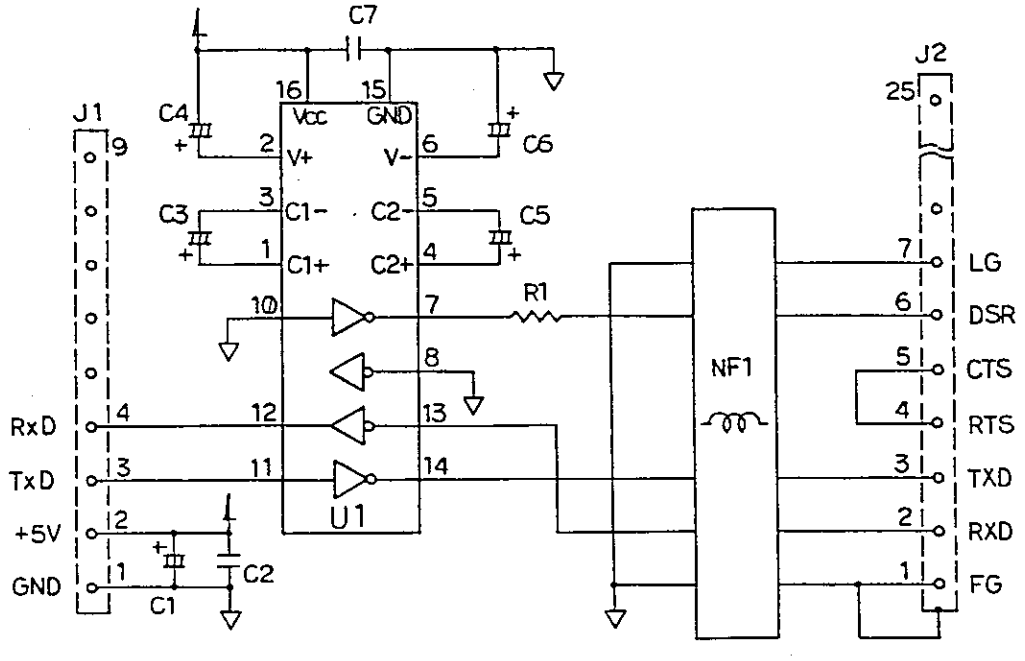
7PZ:2777

CIRCUIT SYMBOL	PARTS NAME	DESCRIPTION	Q'TY
	PC:2777	PRINTED CIRCUIT BOARD	1
C2	CC:0.1U25V	CAPACITOR 0.1μF 25V	1
C1	CK:SME25VB22	CAPACITOR 22μF 25V	1
DF1,2,3	DF:AQV253	PHOTO MOS RELAY	3
BZ1	ET:MEB-12C-5	MICRO BUZZER	1
J2	JA:TCS5076-17	CONNECTOR	1
J1	JI:09P-S2T2-EF	CONNECTOR	1
Q1,2,3,4	QT:BN1A4P	TRANSISTOR BN1A4P	4
R1,2,3	RC:NAT680R	RESISTOR 680Ω 1/4W	3
	07:3000118	PANNEL	1
	08:4001058	SEAL	1

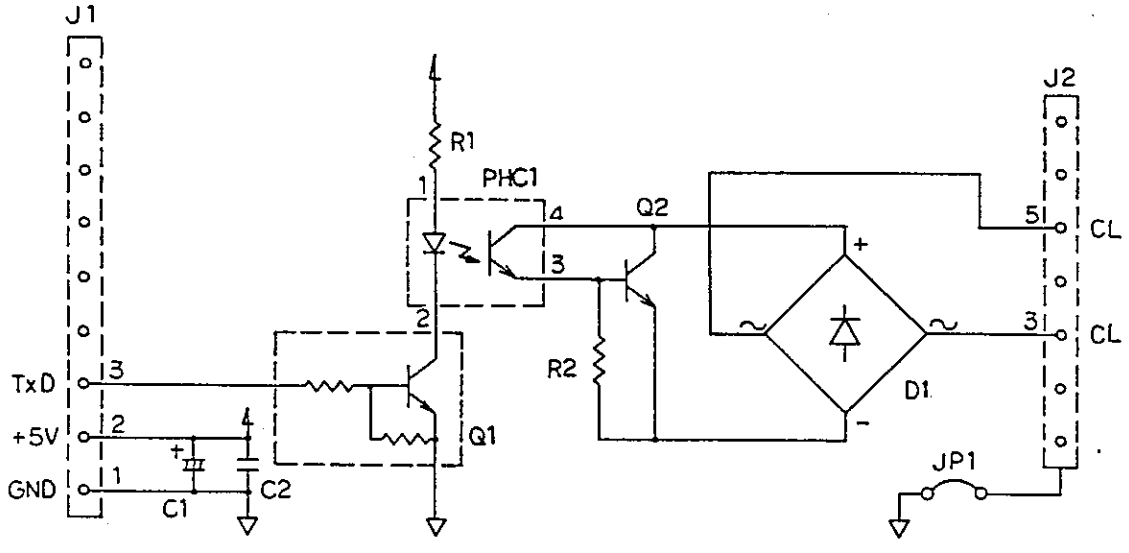

Model
EK/EW-G
Description
Stock No.
PZ:2773
Drwg. No.
QD-EC3-0000063
PZ:2773-MAIN
PZ 2773-PS
A&D CO., LTD.



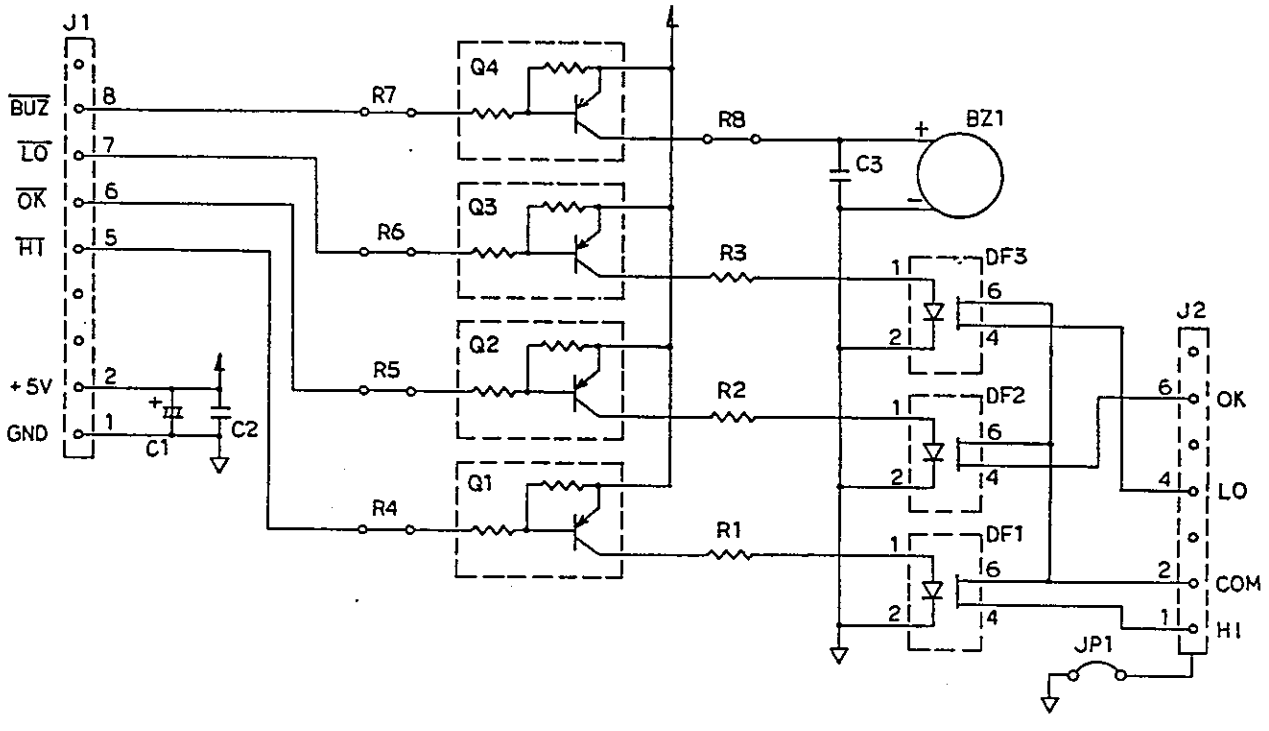
Model	EKW-ϕ9G
Description	
Stock No.	PZ:2774
Drwg. No.	QD-EC4-ϕϕϕϕ25



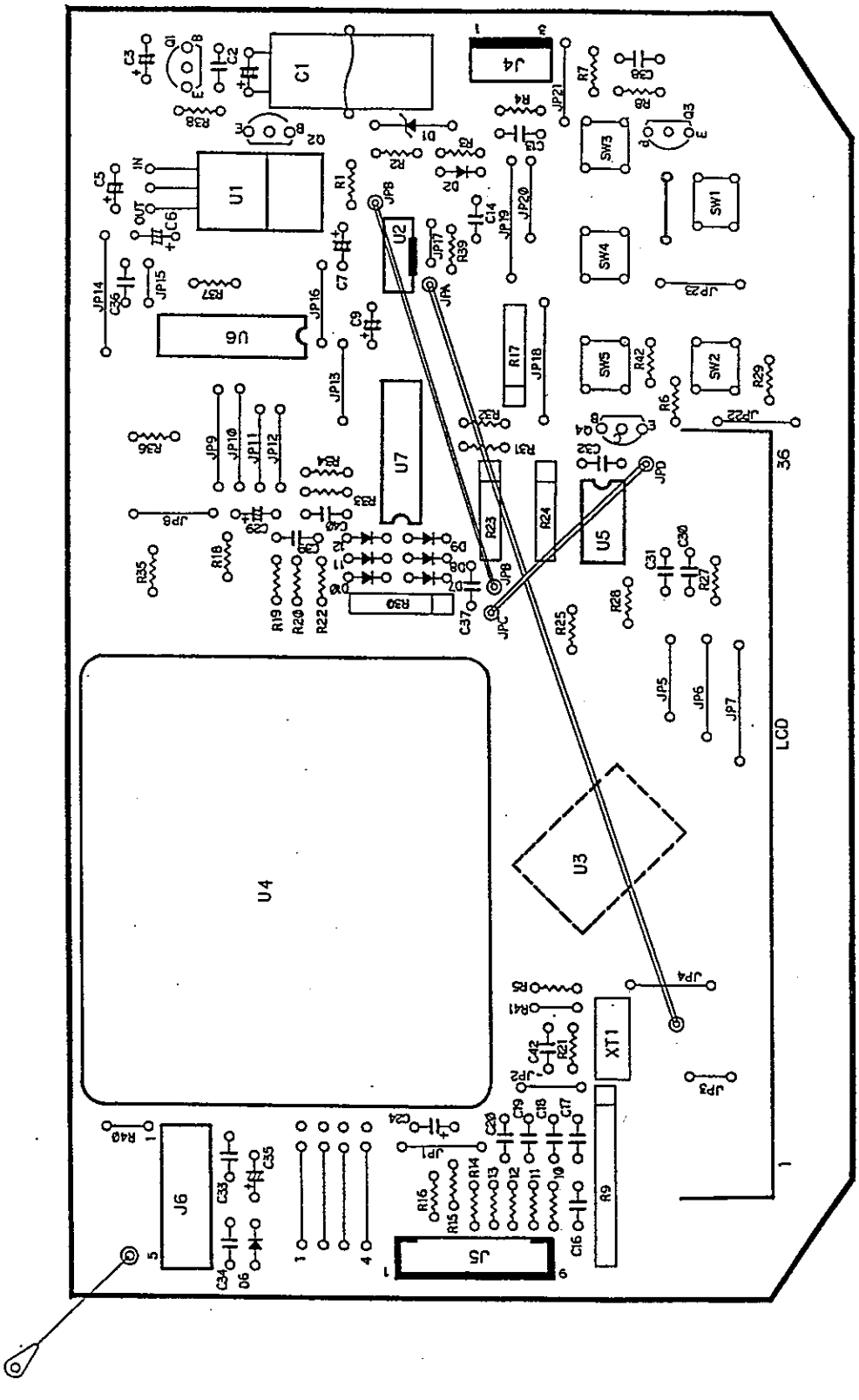
Model	EKW-ØØ3G
Description	
Stock No.	PZ:2775
Drwg. No.	QD-EC4-ØØØØ22



Model	EKW-Ø5G
Description	
Stock No.	PZ:2776
Drwg. No.	QD-EC4-ØØØØ24

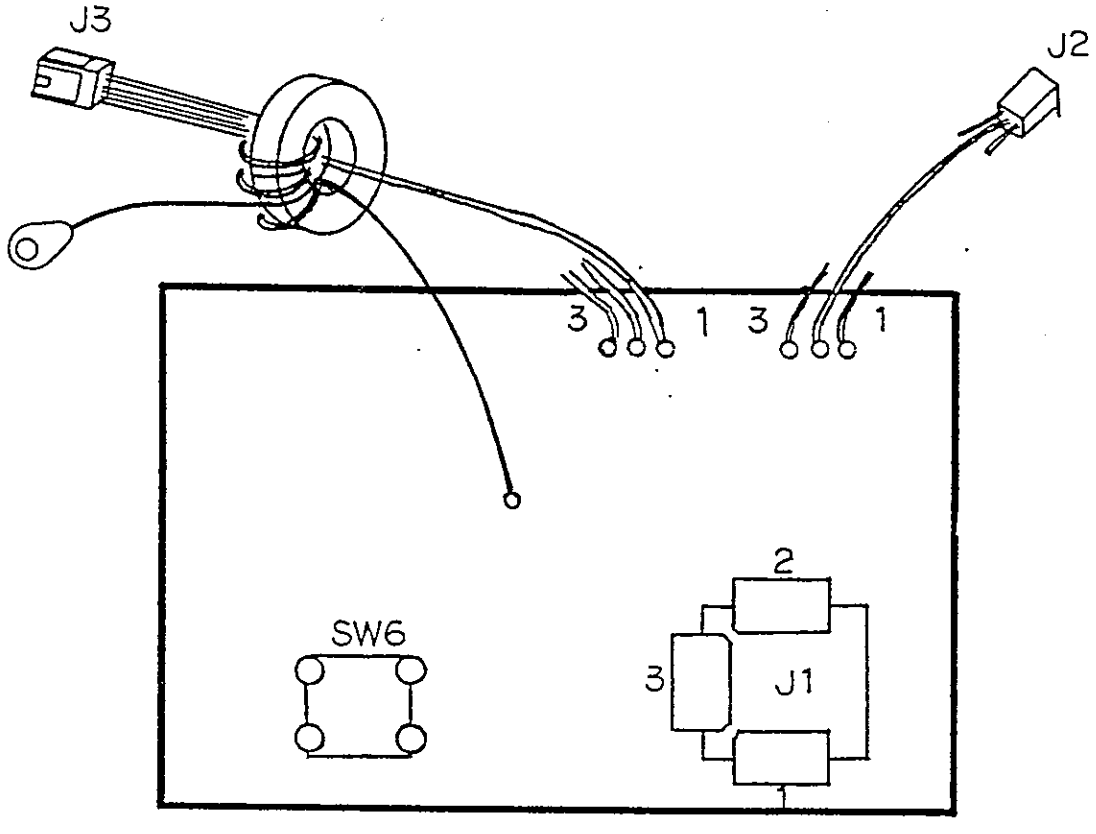


Model	EKW-04G
Description	
Stock No.	PZ:2777
Drwg. No.	QD-EC4-000023

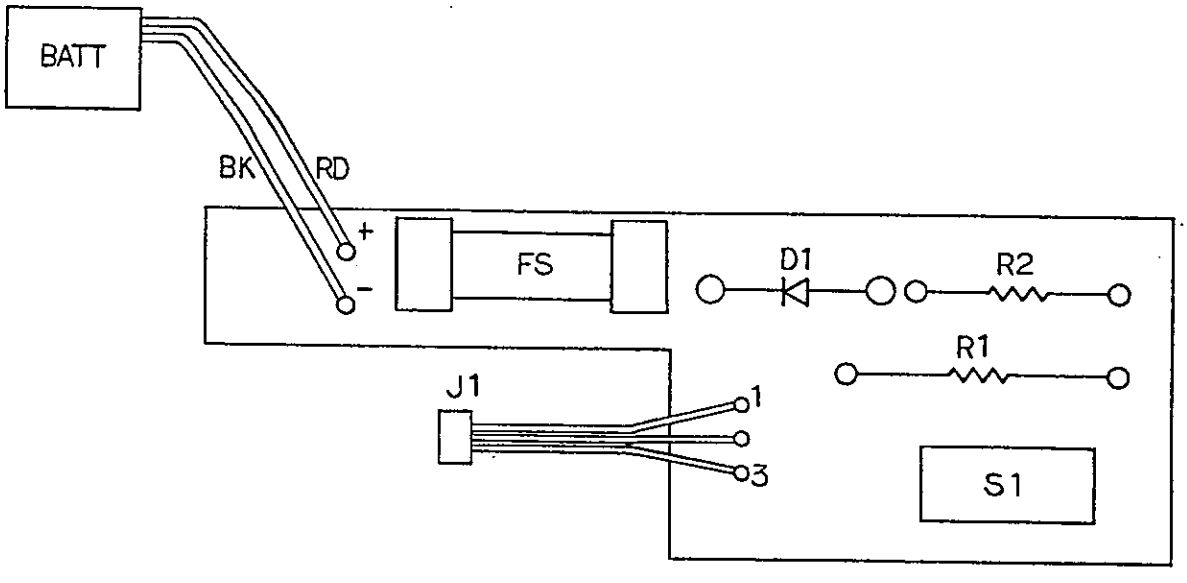


Model	EK-G series
Description	
Stock No.	PZ:2773-MAIN
Drwg. No.	QD-KZ2-00005

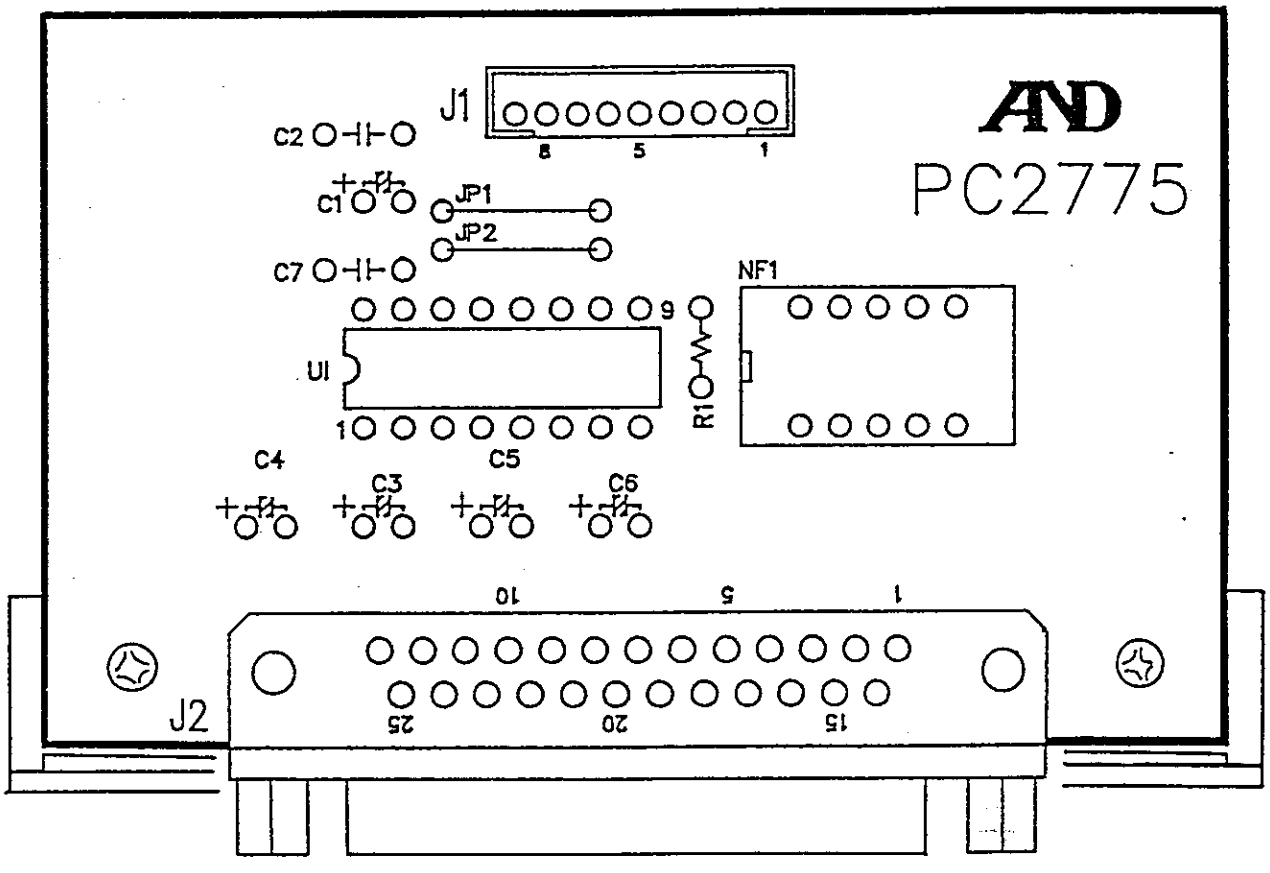
A&D CO., LTD.



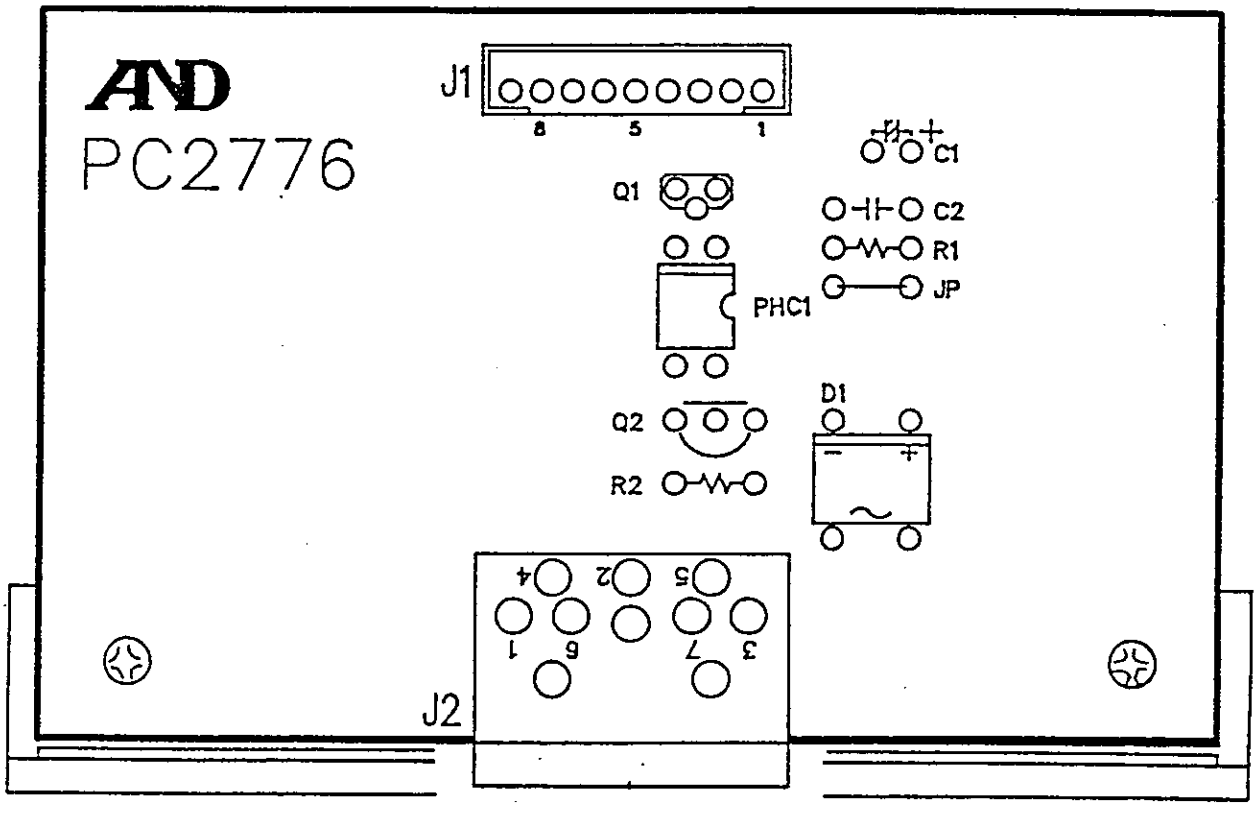
Model	EK-G series
Description	
Stock No.	PZ:2773-PS
Drwg. No.	QD-KZ2-ØØØØ5



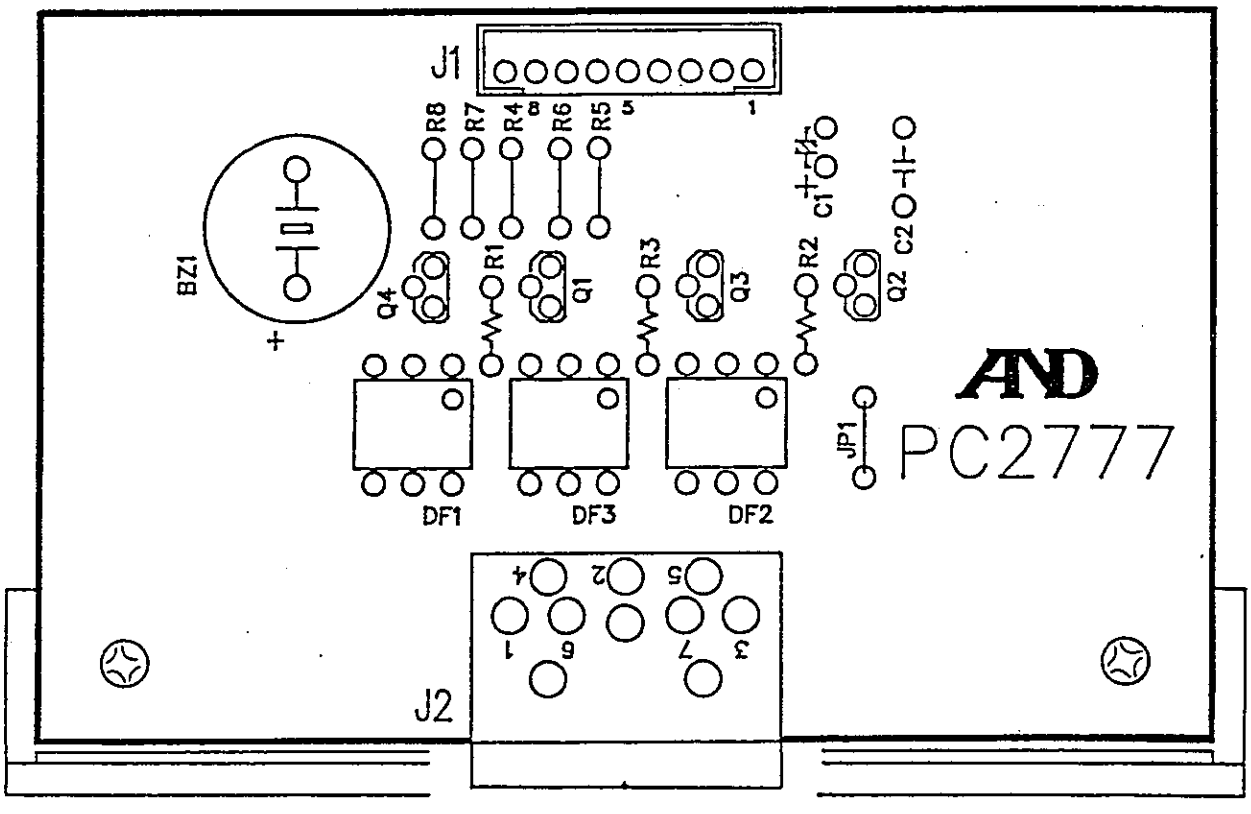
Model	EKW-Ø9G
Description	
Stock No.	PZ 2774
Drwg. No.	QD-KZ4-ØØØØ1Ø



Model	EKW-03G
Description	
Stock No.	PZ 2775
Drwg. No.	QD-KZ4-000011

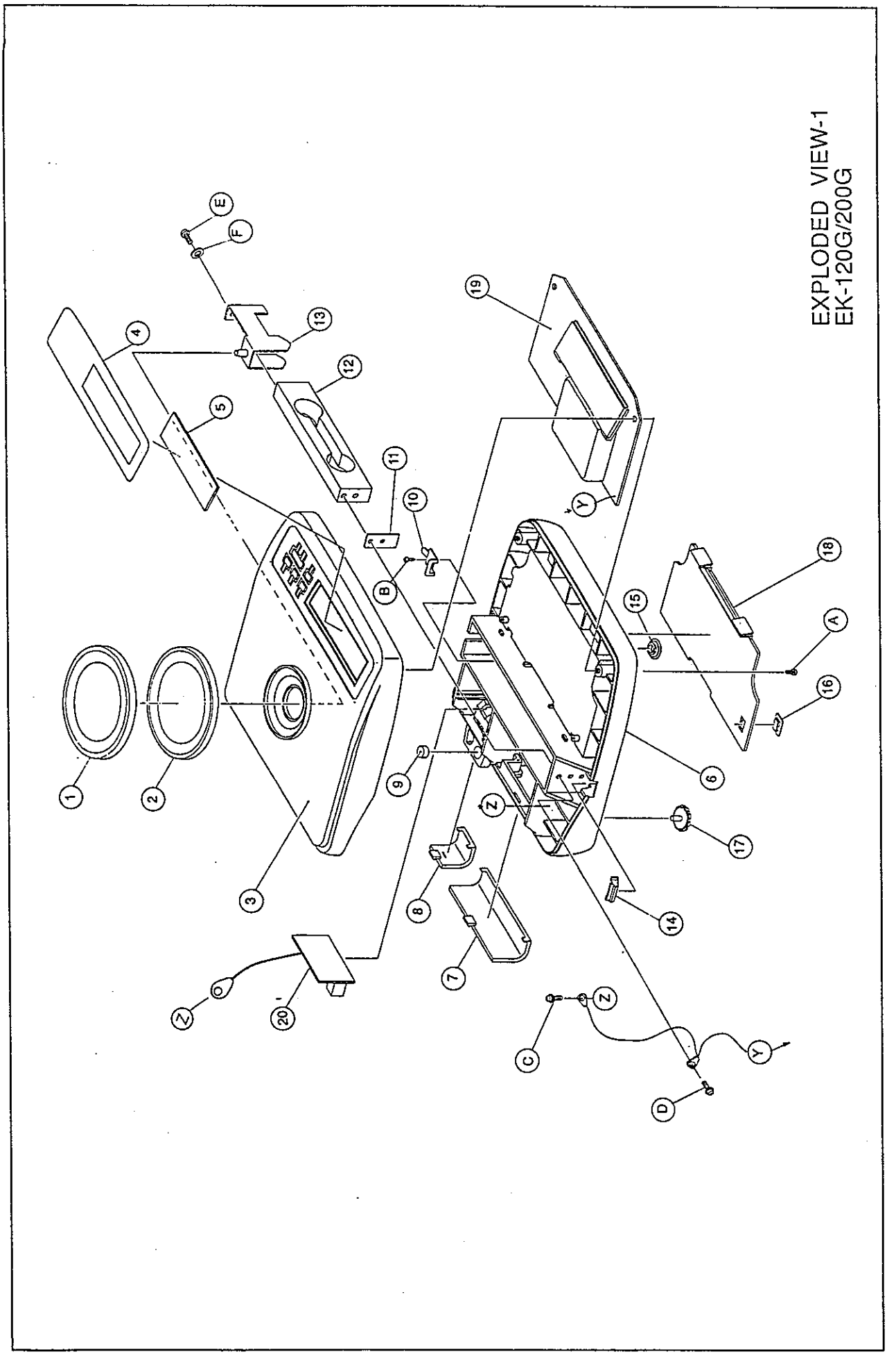


Model	EKW-05G
Description	
Stock No.	PZ:2776
Drwg. No.	QD-KZ4-000012



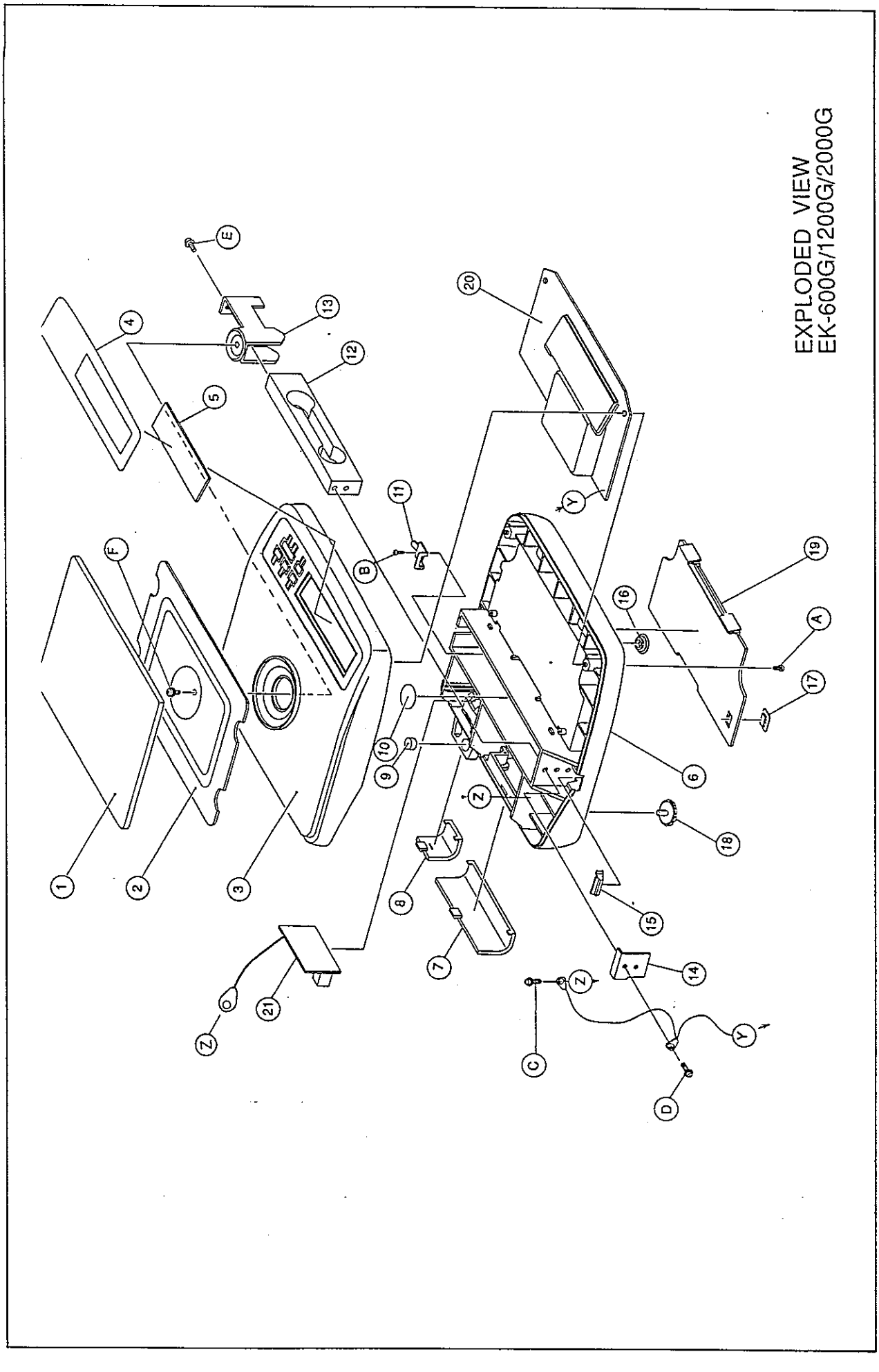
Model	EKW-04G
Description	
Stock No.	PZ:2777
Drwg. No.	QD-KZ4-000013

APPENDIX:B MECHANICAL PART


EXPLODED VIEW-1
EK-120G/200G

EK－120G／200G

NO.	PARTS NAME	DESCRIPTION
1	04:A46385	PAN
2	07:A44236	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000113	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:1000008	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:4000321	UPPER STOP
11	04:A46955	SPACER
12	LC:116-300	LOAD CELL
13	04:A46310	LOAD ANGLE
14	07:4000317	CAP A
15	07:4000318	CAP B
16	07:4000319	CAP.C
17	07:A46041A	FOOT
18	07:2000025	BATTERY COVER
19	PZ:2773	MAIN BOARD
20	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD TAPPING SCREW M3×8
C		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
D		PAN HEAD WITH WASHER AND SPRING WASHER M4×10
E		TRUSS HEAD M4×8
F		WASHER M4

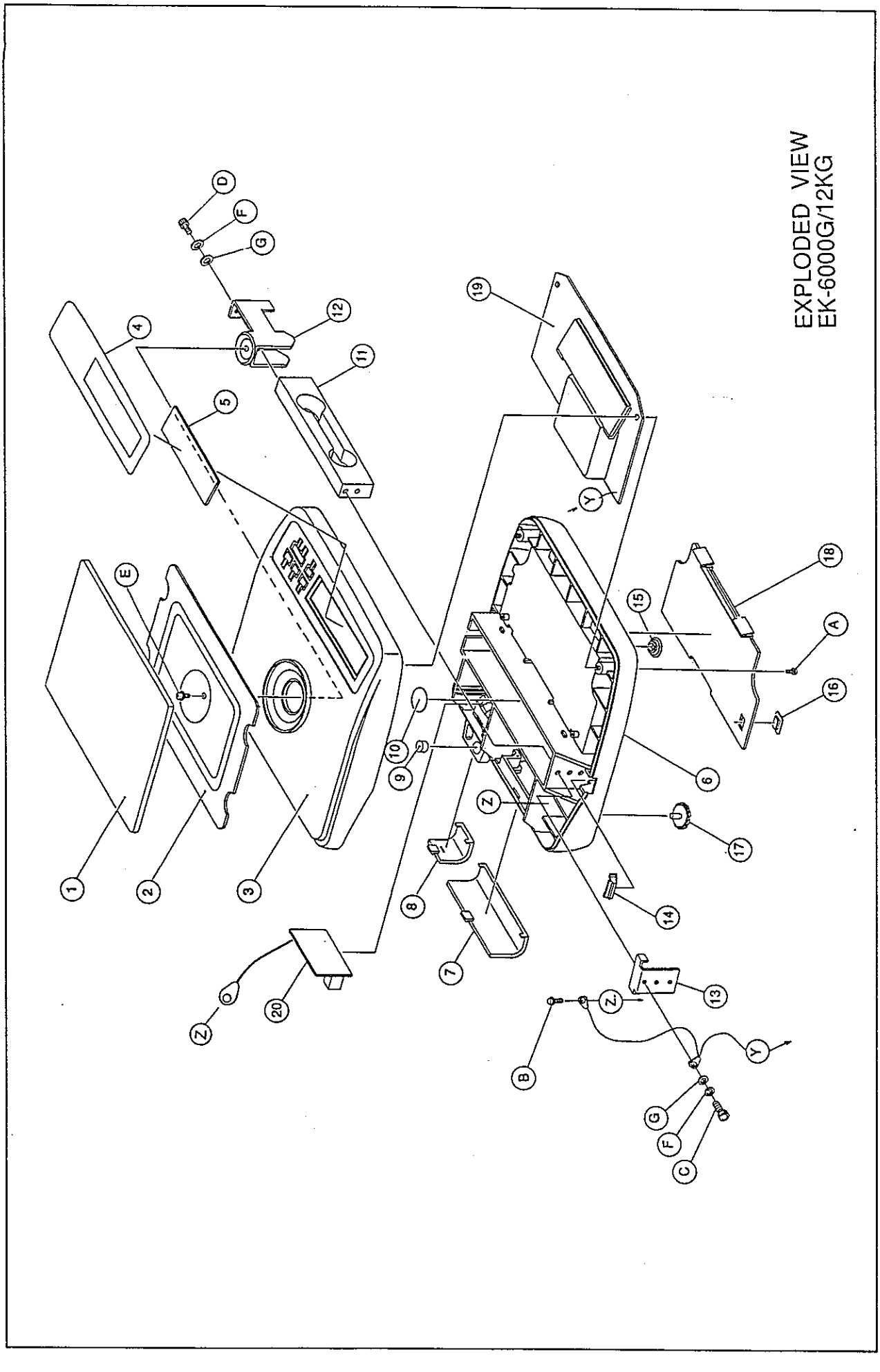

EXPLODED VIEW
EK-600G/1200G/2000G

EK－600G

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	09:A33750	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000113	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:1000008	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:A44251	STOP PLATE
11	04:4000321	UPPER STOP
12	LC:116-600	LOAD CELL
13	04:A46311	LOAD ANGLE
14	04:A44250	LOAD CELL SUPPORT
15	07:4000317	CAP A
16	07:4000318	CAP B
17	07:4000319	CAP C
18	07:A46041A	FOOT
19	07:2000025	BATTERY COVER
20	PZ:2773	MAIN BOARD
21	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD TAPPING SCREW M3×8
C		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
D		PAN HEAD WITH WASHER AND SPRING WASHER M4×12
E		PAN HEAD WITH WASHER AND SPRING WASHER M4×10
F		PAN HEAD WITH WASHER AND SPRING WASHER M4×10

EK－1200G／2000G

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	04:A32888	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000113	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:1000008	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:A44251	STOP PLATE
11	04:4000321	UPPER STOP
12	LC:116-2K	LOAD CELL
13	04:A46311	LOAD ANGLE
14	04:A44250	LOAD CELL SUPPORT
15	07:4000317	CAP A
16	07:4000318	CAP B
17	07:4000319	CAP C
18	07:A46041A	FOOT
19	07:2000025	BATTERY COVER
20	PZ:2773	MAIN BOARD
21	PZ:2773	BATTERY BOARD
21		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD TAPPING SCREW M3×8
C		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
D		PAN HEAD WITH WASHER AND SPRING WASHER M4×12
E		PAN HEAD WITH WASHER AND SPRING WASHER M4×10
F		PAN HEAD WITH WASHER AND SPRING WASHER M4×10

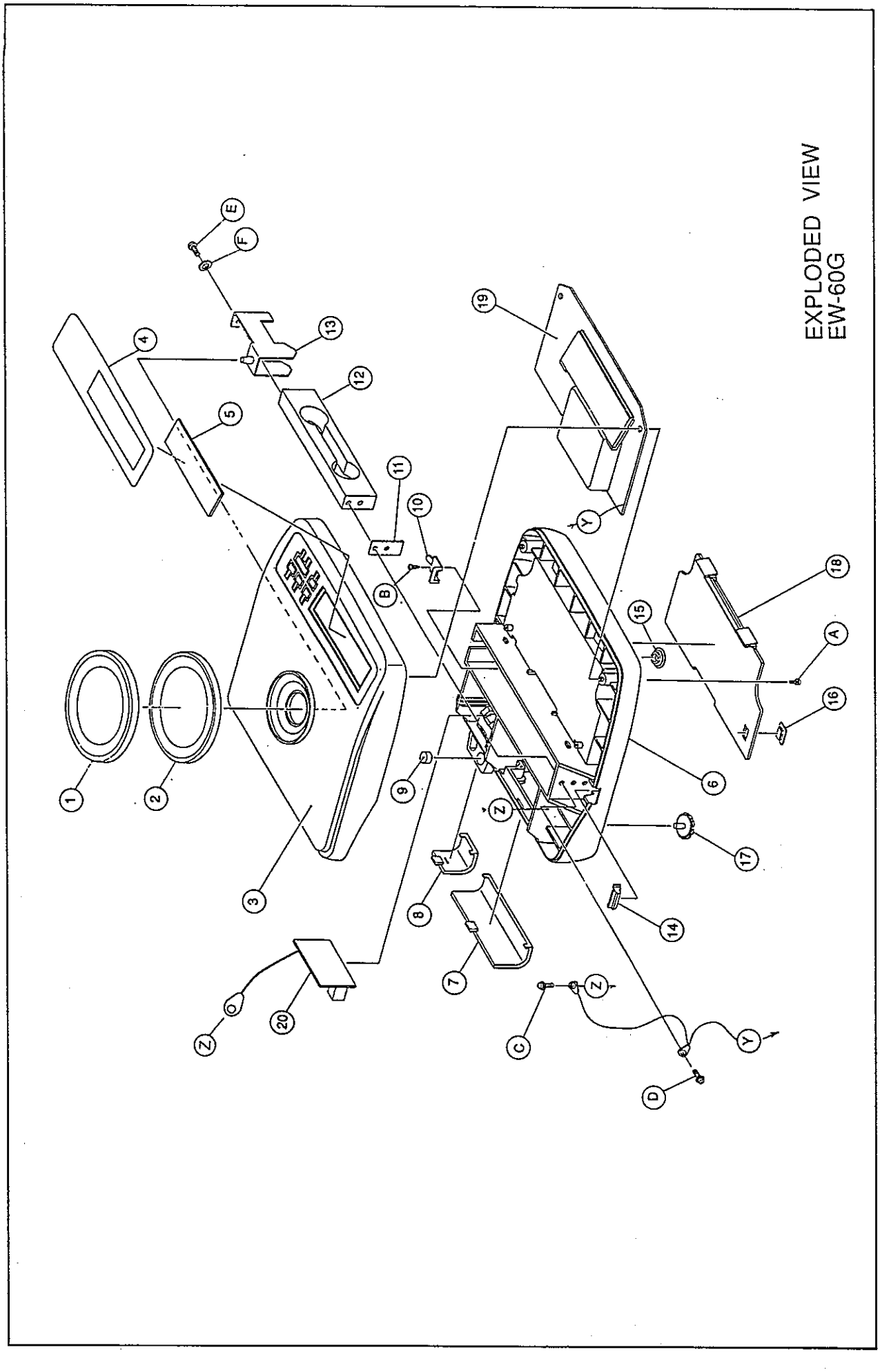

EXPLODED VIEW
EK-6000G/12KG

EK－6000G

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	04:A32889	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000113	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:4000322	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL GUIDE HOLDER
10	04:A44251	STOP PLATE
11	LC:116-6K	LOAD CELL
12	04:3000117	LOAD ANGLE
13	04:4000320	LOAD SUPPORT
14	07:4000317	CAP A
15	07:4000318	CAP B
16	07:4000319	CAP C
17	07:A46041A	FOOT
18	07:2000025	BATTERY COVER
19	PZ:2773	MAIN BOARD
20	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
C		HEXAGON BOLT M4×12
D		HEXAGON BOLT M4×10
E		PAN HEAD WITH WASHER AND SPRING WASHER M5×10
F		SPRING WASHER M4
G		WASHER M4

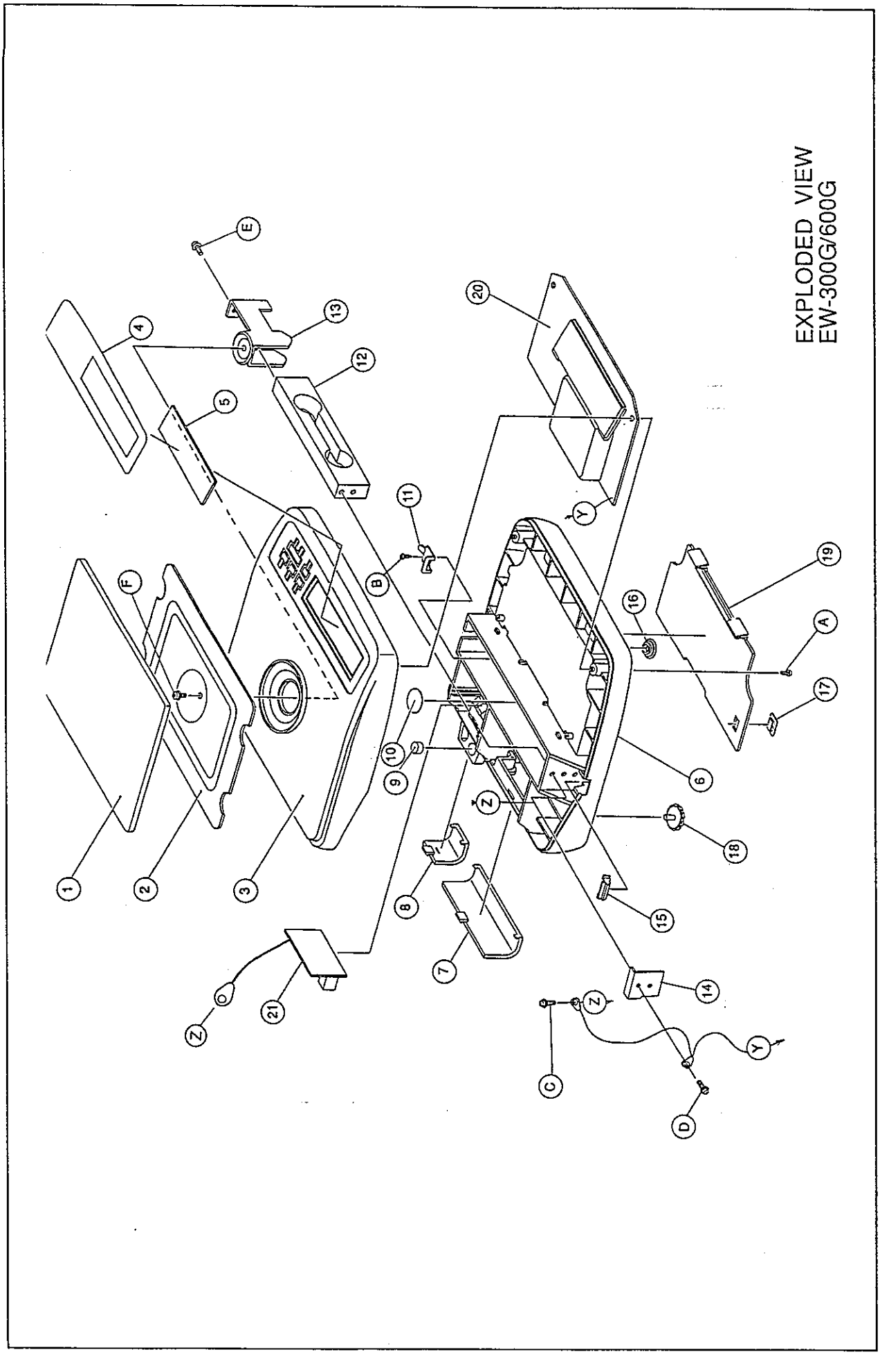
EK－12KG

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	04:A32889	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000113	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:4000322	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL GUIDE HOLDER
10	04:A44251	STOP PLATE
11	LC:116-12	LOAD CELL
12	04:3000117	LOAD ANGLE
13	04:4000320	LOAD SUPPORT
14	07:4000317	CAP A
15	07:4000318	CAP B
16	07:4000319	CAP C
17	07:A46041A	FOOT
18	07:2000025	BATTERY COVER
19	PZ:2773	MAIN BOARD
20	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
C		HEXAGON BOLT M4×12
D		HEXAGON BOLT M4×10
E		PAN HEAD WITH WASHER AND SPRING WASHER M5×10
F		SPRING WASHER M4
G		WASHER M4


EXPLODED VIEW
EW-60G

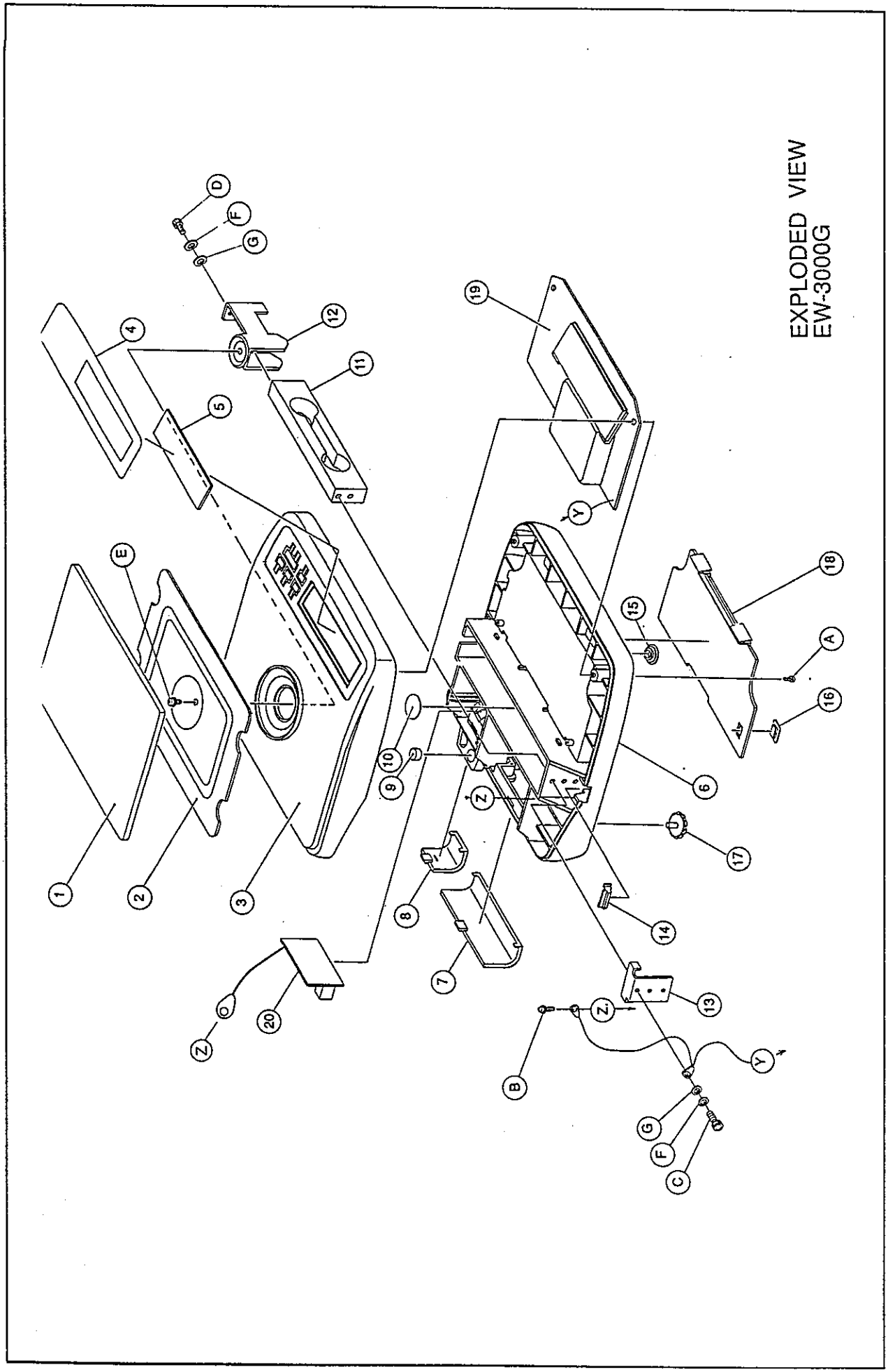
EW－60G

NO.	PARTS NAME	DESCRIPTION
1	04:A46385	PAN
2	07:A44236	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000114	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:1000008	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:4000321	UPPRE STOP
11	04:A46955	SPACER
12	LC:116-300	LOAD CELL
13	04:A46310	LOAD ANGLE
14	07:4000317	CAP A
15	07:4000318	CAP B
16	07:4000319	CAP C
17	07:A46041A	FOOT
18	07:2000025	BATTERY COVER
19	PZ:2773	MAIN BOARD
20	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD TAPPING SCREW M3×8
C		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
D		PAN HEAD WITH WASHER AND SPRING WASHER M4×10
E		TRUSS HEAD M4×8
F		WASHER M4


EXPLODED VIEW
EW-300G/600G

EW－300G／600G

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	04:A33750	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000114	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:1000008	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:A44251	STOP PLATE
11	04:4000321	UPPER STOP
12	LC:116-600	LOAD CELL
13	04:A46311	LOAD ANGLE
14	04:A44250	LOAD CELL SUPPORT
15	07:4000317	CAP A
16	07:4000318	CAP B
17	07:4000319	CAP C
18	07:A46041A	FOOT
19	07:2000025	BATTERY COVER
20	PZ:2773	MAIN BOARD
21	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD TAPPING SCREW M3×8
C		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
D		PAN HEAD WITH WASHER AND SPRING WASHER M4×12
E		PAN HEAD WITH WASHER AND SPRING WASHER M4×10
F		PAN HEAD WITH WASHER AND SPRING WASHER M4×10


EXPLODED VIEW
EW-3000G

EW—3000G

NO.	PARTS NAME	DESCRIPTION
1	04:A44255	PAN
2	07:A32889	PAN SUPPORT
3	07:1000007	UPPER CASE
4	08:3000114	SWITCH
5	07:4000316	DISPLAY FILTER
6	07:4000322	LOWER CASE
7	07:3000116	OPTION BLANK PANEL
8	07:3000115	CAL SWITCH COVER
9	00:4000879	LEVEL VIAL HOLDER
10	04:A44251	STOP PLATE
11	LC:116-6K	LOAD CELL
12	04:3000117	LOAD ANGLE
13	04:4000320	LOAD CELL SUPPORT
14	07:4000317	CAP A
15	07:4000318	CAP B
16	07:4000319	CAP C
17	07:A46041A	FOOT
18	07:2000025	BATTERY COVER
19	PZ:2773	MAIN BOARD
20	PZ:2773	BATTERY BOARD
A		PAN HEAD TAPPING SCREW M3×10
B		PAN HEAD WITH WASHER AND SPRING WASHER M3×6
C		HEXAGON BOLT M4×12
D		HEXAGON BOLT M4×10
E		PAN HEAD WITH WASHER AND SPRING WASHER M5×10
F		SPRING WASHER M4
G		WASHER M4

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